ADAPTING THE EDUCATION SYSTEM TO THE CONDITIONS OF THE DIGITAL TRANSFORMATION OF LABOR MARKET: RUSSIAN CASE

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ABSTRACT

As a result of the impact of digitalization of the economy on the labor market, a complex of problems is formed both for the state and for business. This article studies the key areas of optimization of the Russian education system. The purpose of the study is to identify the directions of changes in the education system in accordance with the conditions of the digital economy and the requirements of the labor market. The result of the study is the model of transformation of the higher education system. Authors show that in the context of rapidly changing technologies, professions and labor market requirements, it is advisable to divide the higher education system into several segments.

Keywords: Digitalization, Labor Market, Competency, Professional Skills

INTRODUCTION

The large-scale digitalization of the economy and the public life in the upcoming decades will have a significant impact on the labor market both globally and nationally. In the long term, this will lead to a significant release of currently employed workers, a reduction in the number of currently existing jobs that require an average level of qualifications of a worker, as well as an increase in the disparity in levels of remuneration of labor between skilled and unskilled workers. At the same time, it is possible to highlight the positive consequences of the impact of digitalization of the economy on the labor market. As a result of development and dissemination of digital technologies, digital platforms are emerging that extend the workers' possibilities to find employment, including those with social or geographic constraints. Digital technologies help employees develop additional professional skills and improve their qualifications. Digital technologies also make it possible to increase productivity of the company personnel and provide access to high-quality education for many students. In addition, digitalization contributes to emergence of new professions related to information processing, as well as high-payed new jobs.

It should be noted that transformation of business processes as a result of digitalization leads to a change in the demand of enterprises for the competence of employees. Accordingly, both business and employees have a request to the education system to develop the competencies necessary for the digital economy.

The problematics of transformation of the labor market under the influence of digitalization of the economy has been actively studied by both Russian and foreign experts. The issues of transformation of the education system, its adaptation to the requirements of the digital economy attract the attention of mainly foreign researchers today.

Boulware K. and Kuttner K. study the trends in transformation of the world labor market under the influence of digitalization of the global economy, highlighting such a concept as the digital labor market, comparing it with the traditional labor market (Barykin, 2021).

Mikkonen I. studies the directions of transformation of the labor market and changing requirements for the competence of workers in the context of digitalization (Global Commission on the Future of Work, 2019).

Peck J. and Tickell A. study the differences between the traditional pre-digital and the modern labor market, analyzing disappearing and emerging professions (Graczyk-Kucharska, 2019).

Thus, the problem of changing the labor market and the competencies of workers it requires, as well as transforming the education system in accordance with these changes, is of particular relevance today.

METHODOLOGY

Until recently, the Russian economy was focused primarily on development of the raw materials cluster. Accordingly, the Russian education system, meeting the needs of the economy, was aimed at training specialists who have the competitiveness characteristic of an industrial type of economy.

For a graduate of an education system that functions in the industrial society, the main qualities are purposefulness, intelligence, high discipline, a clear desire to achieve a high professional level. The advantage of such an education system, which operates in the industrial society, is a high degree of probability of formation of a qualified specialist with the competencies necessary for the economy. The availability of the education system in the industrial society is determined by the existing understanding of the patterns of the process of growing up and professional formation. However, in the information society, the combination of qualities and competencies of an industrial society specialist does not provide every educated specialist with decent employment.

During the formation of the information society, a change in the ontology of education occurs, since a change takes place in the complex of basic existential qualities and characteristics of a person as such. In addition, in the information society, there is a growing desynchronization of various processes taking place within the framework of the physical reality and the virtual reality. Accordingly, in the education system, this desynchronization manifests itself as a gap between the high-speed flow of information within the virtual sector of the education system (that is, distance education) and the educational process carried out in a traditional format.

Continuous education, the need for which is determined by the high speed of scientific and technological progress, should be understood today as a specific system with a set of fundamental characteristics. Such characteristics include the volatility (variability) of the education system, the generic nature of the education system and the fundamental «complexity» of internal processes operating in the education system, the flow algorithm of which is set in modern conditions by the network logic.

In the information society, the main qualities for a graduate of the educational system are the educational identity of a graduate, the ability to create the necessary information and the ability to create innovation (Mikkonen, 2019).

Thus, a competitive graduate of the education system operating in the information society must have the following key parameters. First, the ability to create information and use

information with the help of information technology. Secondly, the ability to appropriate social practices, as well as the ability to carry out their configuration in a targeted manner. The key advantage of the education system that functions in the information society is the ability of this system to continuously transform. The boundaries of the education system in the information society become transparent. As a result, any person can join the education system at any time, while being at any point in physical space. Moreover, a person can simultaneously use a set of different methods and tools for personal development and formation of his/her professional qualifications.

The problems of accessibility of the education system in the information society, accordingly, manifest themselves differently than it happens within the industrial society. The accessibility of the vocational education system in the information society is determined by the social and cultural problem of the existence of information inequality, which also becomes of the nature of an economic problem. The lack of the necessary digital infrastructure limits access to information resources and excludes a person from the education system. Thus, a social exclusion of uneducated people takes place from most segments of the labor market, which reduces their opportunities for successful self-realization.

RESULTS

Digitalization of many business processes, on the one hand, leads to general complication of a large number of different professions. On the other hand, as a result of automation of routine operations, the time of many employees is freed up and can be used for solving a set of more complex tasks of a creative nature. At the same time, digitalization leads to a significant increase in the level of requirements for the necessary qualifications of employees. In future it will lead to massive dissemination of an approach to the distribution of existing responsibilities which is new for the economy. For a long time, the distribution of responsibilities has been based on the "1 person - 1 task" principle. A new approach to the distribution of responsibilities assumes that one employee or a team consisting of a small number of employees can be fully responsible for a certain complex process or for execution of several processes with different profiles (Peck, 2020).

The existing sectoral structure of the national economy, the set of technologies used by enterprises, as well as the general technical level of production activity determine the requirements for the professional composition of employees and the parameters of demand for various categories of labor, including the required professional competencies.

Today, according to the nature of the work tasks performed, all types of work activities can be divided into three categories: "a skill", "a rule" and "the knowledge". The "skill" category in the modern conditions includes physical labor, which is of a low-skill nature. Such work does not require any long-term education and significant professional training from an employee. This category of work activity includes cleaners, drivers, as well as security guards and salespeople. The "rule" category includes the labor which is reduced to routine activities carried out within the framework of existing rules and regulations at the workplace. Assigned to this category are such workers as locksmiths, accountants, massage therapists. Finally, the "knowledge" category includes high-skill work of an intellectual nature (Lauder, 2020).

Today, only 17% of the Russian employed population are engaged in the "knowledge" category. 35% of the employed population are engaged in the "skill" category, and 48% of the employed population are engaged in the "rule" category. It should be noted that in most developed countries about 25% of the employed population are engaged in labor of the "knowledge" category.

It is important to note that with the change in technology, there is a change in the requirements of employers to workers. Accordingly, workers in the near future will have to adapt to the new conditions arising in the national labor market and the demands of employers.

For this, employees need to have a set of useful and relevant labor skills and competencies in modern conditions (Boulware, 2019).

In particular, experts highlight the "basic" competencies and basic skills that are currently required by employers from employees.

1. Cognitive flexibility - the ability to generate or use different sets of rules to combine or group information.
2. Integrated problem solving - advanced capabilities used to solve new, poorly defined problems in challenging real-world environments.
3. Coordination with the others - adjusting your own actions in relation to the actions of other people.
4. Creativity - the ability to come up with unusual ideas about a given topic or situation, or develop creative ways to solve a problem.
5. Critical thinking - the use of logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
6. Emotional intelligence - awareness of reactions of other people and understanding why they react that way.
7. Judgment and decision-making - considering the relative costs and benefits of potential actions to select the most appropriate one.
8. Negotiation - the ability to bring other people together and reconcile disagreements.
9. Personnel management - motivation, development and management of people during their work, selection of the most suitable employees for a certain job.
10. Customer focus - actively seeking ways to satisfy customer needs (Barykin, 2021).

This list of skills and competencies does not mean that every employee entering the labor market must necessarily have all of the above qualities and skills. Nevertheless, every year the need for workers to master more and more of the skills from the above list increases. Moreover, in the context of work from the "knowledge" category, this need does not depend on the position occupied by an employee (Asali, 2020).

Besides, it is necessary to highlight a separate list of competencies, which in the near future every manager must necessarily possess, regardless of the level of leadership, industry and field of activity. First of all, in the short term, the most demanded competencies and skills for any manager will include: management of organizational changes, the ability to effectively solve complex and new tasks in an environment of increasing uncertainty, creativity and a high level of emotional intelligence (Report of the International labour organization). These competencies overlap with the above "basic" competencies for all skilled workers. At the same time, more rare and specific skills will be required from a leader in the future. Besides, the high-level competencies that are often necessary for a leader can only be developed in adolescence or youth. This, in turn, means that it will be much more difficult for elder workers who do not have these competencies to occupy any managerial positions.

In those segments of the labor market that require workers to have a lower qualification level, in the future, there will be a noticeable increase in competition of personnel for jobs. In addition, the level of workload on highly qualified employees will increase in the future. By 2025, a massive entry of Generation Z workers into the labor market is expected. This will change the nature of employers' competition for talent (Barykin, 2021).

According to forecasts of the Federal State Statistics Service, over the next decades, a decrease in the number of able-bodied population is expected in our country. To mitigate the complex of negative consequences of such phenomenon, a large-scale production automation is planned. In such conditions, we can say that "digital" human resources with the necessary competencies act as a strategic asset for our country. Accordingly, the lack of this asset will inevitably lead to a slowdown in the country's economic growth in the future. Thus, today, one can consider the provision of our country with a number of specialists having the necessary qualifications in the field of digital technologies, sufficient for economic development, as a state priority. This task can only be accomplished with the active participation of the Russian education system.

Currently, serious problems are particularly exacerbated, associated with the non-consistence of the existing composition, structure, and also the quality of professional programs offered by the Russian education system with the current requirements of the labor market. Such inconsistence is due to a number of the following circumstances.

First, as more and more different work operations are becoming automated, a change in professions and their content takes place. An update of existing approaches to education will be required, as well as the readiness of the education system for massive retraining of existing personnel.

Second, the involvement of the population in development of the digital economy is possible only in case of massive provision of the country's citizens with accessible digital infrastructure, the active development of digital literacy and digital competence of the population.

Third, the success of the planned digital transformation of the economy requires active and fruitful cooperation of three parties: the state, business and the scientific community.

In the near future, the government, business and Russian educational institutions will have to coordinate and pre-plan actions to prepare for future technological and economic changes. Despite the fact that today there is a rapid change in the technological structure, the Russian sphere of education remains one of the most conservative. Review of the existing list of professions for which training is offered by the Russian education system shows that many of these professions will practically lose their place in the labor market over the next ten years. Accordingly, after the labor market demand for "old" specializations decreases or disappears, workers will need retraining. The consistence of the list of training programs proposed by the education system to the labor market requirements can be illustrated with the help of such an indicator as the correspondence of the labor activity of graduates to their acquired specialization.

Figure 1 shows the dynamics of correspondence of the labor activity of graduates of the higher education system to the acquired specializations.
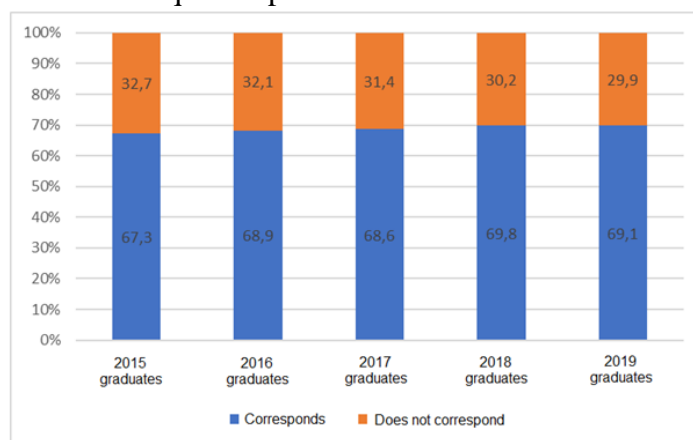

FIGURE 1
CORRESPONDENCE OF THE LABOR ACTIVITY OF GRADUATES OF THE HIGHER EDUCATION SYSTEM TO THE ACQUIRED SPECIALIZATIONS

Over the past five years, about 30% of graduates of the higher education system have been employed in positions that do not correspond to their specialization.

Figure 2 shows the dynamics of correspondence of the labor activity of graduates of the secondary vocational education system to the acquired specializations.
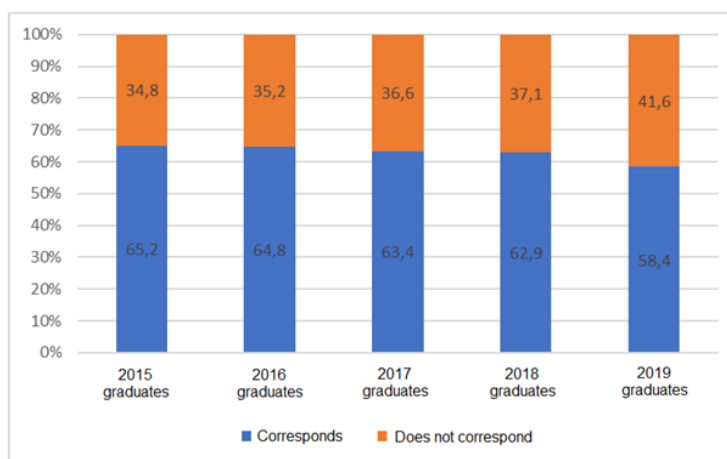
FIGURE 2
CORRESPONDENCE OF THE LABOR ACTIVITY OF GRADUATES OF THE SECONDARY VOCATIONAL EDUCATION SYSTEM TO THE ACQUIRED SPECIALIZATIONS

Among graduates who have received secondary vocational education, the share of those working in accordance with their specialization is even lower. Moreover, the share of graduates who are employed in positions that do not correspond to their specialization has been increasing over the past five years - from 34.8% to 41.6%.

Representatives of enterprises often say that they are not interested in graduates who have a narrow specialization. Enterprises are ready to provide new employees with the specific knowledge required to fill specific positions by their own efforts. At the same time, enterprises need the workers graduating from the universities who are able to learn as quickly as possible, master new job tasks, effectively communicate with colleagues and take on the necessary responsibility.

Russian universities are now ready to hear from employers the actual requirements for the necessary professional competencies of graduates. However, today the requirements of employers lie in a different area from professional competencies. Employers require soft skills, which include functional literacy of a graduate, comprehensive knowledge, willingness to learn and regularly update his/her knowledge. Accordingly, Russian universities should pay attention to development of soft skills in their graduates, demanded by employers. However, it should be understood that the fundamental training provided by the higher education system to graduates cannot be replaced by a set of technologies that employers need. The emerging dialectical differentiation of the tasks of the education system requires the formation of a new attitude among students towards the knowledge and skills acquired.

One of the most important directions of qualitative development of the education system in modern conditions is the widespread use of digital technologies in the educational process. Digital technologies help people acquire a variety of new knowledge and skills through distance learning. This knowledge and skills are used both to improve employees' own qualifications and to master any new professions (Barykin, 2021). Online courses allow students to receive a set of new knowledge in such a time mode that is most convenient for them. Based on the results of completing the entire course of classes, students can receive electronic or paper certificates of mastering a certain electronic educational module.

In the process of distance learning, the possibilities of the virtual reality technology are actively used. This allows to qualitatively change the existing competencies of the a through intellectualization of the ongoing virtual communication. The change in competencies occurs not only because the students develop a certain level of their own educational identity. Also, a change in competencies is an effect that arises as a result of the interactive use of web practices by students.

It should be noted that today, in the context of rapidly changing requirements of the labor market, an efficiently functioning system of additional professional education and professional development is needed. First, the automation of labor operations and business processes leads to a change, as well as the complete or partial disappearance of many specialties from the labor market. At the same time, today there is a massive shortage of qualified specialists who possess the required amount of digital skills. Accordingly, it is necessary to ensure, as soon as possible, a high degree of achievement of the basic level of digital literacy by the country's population. Second, even at the most advanced enterprises, technological cycles become obsolete in several years, which requires changes in technological cycles and preparation of workers for these changes.

In solving the current task of providing the Russian economy with qualified personnel who possess the required amount of knowledge in digital technologies, it is necessary to ensure the availability of modern centers for advanced training of workers and retraining of personnel throughout the country. Such centers will allow employees of those companies, that currently cannot independently organize the entire process of training employees and improving their qualifications, to acquire the necessary new skills and competencies. In addition, it is necessary to envisage and in the near future to develop programs aimed at adapting workers who have lost their jobs as a result of automation of processes and labor operations.

Within the framework of the national program "Digital Economy of the Russian Federation", the following tasks have been set:

1. to develop and test competency models that ensure effective interaction between the society, business, the labor market and education in the digital economy;
2. to develop a mechanism for independent assessment of competencies within the education system and the labor market.

Program indicators in the field of personnel training within the framework of the federal project "Human Resources for the Digital Economy" have been determined. These indicators are illustrated in Figure 3.
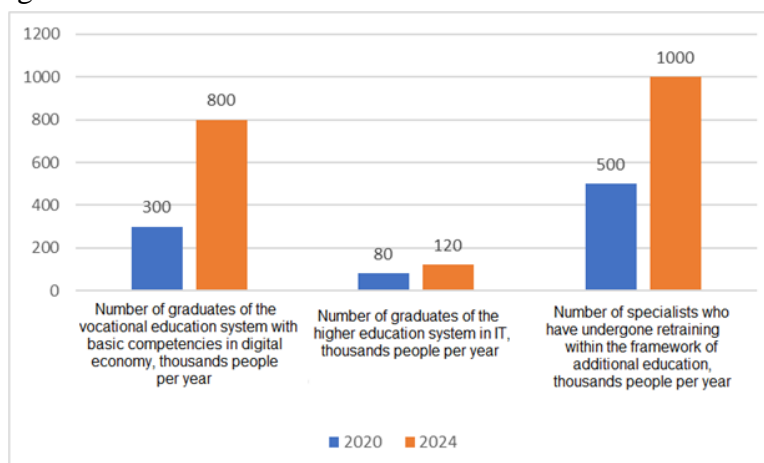

FIGURE 3
PERFORMANCE INDICATORS OF THE FEDERAL PROJECT "HUMAN RESOURCES FOR THE DIGITAL ECONOMY"

It turns out that "it is necessary to develop educational and professional regulatory programs, competencies, launch a number of pilot programs, provide qualified personnel in the field of digital technologies, as well as develop a system of certification of competencies, and by 2024 create conditions that ensure constant, uninterrupted renewal of human resources". In transition to new economic conditions, it is necessary to take into account not only

opportunities, but also risks, such as a shortage of personnel, insufficient qualifications of workers and structural unemployment.

DISCUSSION

Authors propose to discuss a model for reorganizing higher education in accordance with the conditions of the knowledge economy (Barykin, 2021). In the context of rapidly changing technologies, professions and labor market requirements, it is advisable to divide the higher education system into several segments.

The first segment is the short-term general higher education (2-3 years), organized in broad areas of professional training. In future, due to changes in the economy and their speed, it will be difficult for a young person to choose a narrow specialization, because before graduation, the student may not know if such a specialization exists. This short-term education will include:

A. On the one hand, basic cross-cutting competencies and related disciplines, for example, 10 soft skills.

B. Fundamental competencies resulting from successful completion of the fundamental disciplines, each of which is defined for the main areas of vocational training, established in accordance with employers, with a shortened time frame for changes, for example, once every 10 years.

C. After graduation, a person will receive a certificate indicating his/her fundamental training and the chosen direction of professional training, with the exception of regulated professions. On this basis, a graduate's career will be built, depending on his/her human skills and market requirements (for example the specific skills regarding the implementation of digital twins in some in business activities (Barykin, 2021). The short-term graduate will have to choose between several fields in order to base upon the fundamental one, through specialized study programs.

The second segment is the specialized higher education.

After a short cycle, a period of study or specialization of 1-2 years in the desired field is assumed in accordance with the fundamental field. This period can be divided into two stages:

1. On-site training, the duration of which does not exceed 1 year. Over time, such training can be repeated at intervals of 5 years. A person will be able to change the field of his/her activity and/or will undergo retraining several times in life, depending on skills, market, desires and other personal requirements. Due to the recognition of qualifications, this retraining period can be reduced to 6 months. This system is especially useful for young people who are attracted by a fundamental field, but do not know which narrow field of training to choose, and continue to search until they find a narrow field that they like (Barykin, 2021). Along with appropriate practice, this usually takes the form of formal training.

2. Specialized training. The graduate will be able to choose between specialized study programs for the desired specialization. Specialized courses will take place at a faculty level as part of a formal or postgraduate continuous education system, through short specialized courses.

The duration of such programs can be shortened over time by recognition of competencies and previously acquired learning outcomes or through experience. The role of experience will increase significantly due to special theoretical training.

CONCLUSION

Optimization of the Russian education system assumes that the state and business in modern conditions must plan in advance what employees will do after completing their education. Thus, today, a qualitative update of previously outdated vocational education and training programs can become one of the steps on the part of the state to adapt the Russian education system to the current needs of the labor market in formation of the digital economy. Such upgrade is necessary to close the workers' gaps in digital skills. It is advisable to manage these transformations on a federal scale.

Besides, it is fundamentally important for the Russian education system to already train specialists who can work in the emerging knowledge economy by developing students' digital competencies and soft skills required by employers.

Moreover, in the context of rapidly changing technologies, professions and labor market requirements, it is advisable to divide the higher education system into several segments. The first segment is the short-term higher education, the second segment is the specialized training, which is also divided into two stages.

Thus, optimization of the Russian education system assumes that the state and business in modern conditions must plan in advance what employees will do after completing their education. Besides, it is fundamentally important for the Russian education system to already train specialists who can work in the emerging knowledge economy by developing students' digital competencies and soft skills required by employers.

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