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Strategic Initiatives of Education Development in Russia in the Conditions of Development of Digital Technologies

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Abstract—The article deals with the issues of supporting the country's own competitiveness through the modernization of the education system and professional retraining of personnel. The digital era will require the adaptation of educational infrastructure to new conditions. By carrying out work on improvement of educational infrastructure which is necessary to create opportunities for self-realization for the successful development of the digital economy, the education and retraining system should provide the economy with specialists who meet the requirements of the digital age. The relevance of the study is the need to substantiate strategic initiatives that adapt the educational infrastructure to new needs, can significantly strengthen the economic position in the transition to a digital economy. Today it is necessary to achieve universal digital literacy. For this, the educational system at all levels should be seriously improved: from school to higher educational institutions and deploy training programs for people of all ages.

Keywords—educational system; educational infrastructure; digital economy; professions and crafts

I. INTRODUCTION

The mission of the development of education in the digital economy in Russia is to improve the quality of life, ensure the country's competitiveness and national security. The goal of Russia in the perspective of 15–20 years is to join the group of leading economies of the world through digital transformations of traditional industries and the development of an independent and competitive digital industry. For the successful strategic development of the economy, the system of education and retraining of personnel should provide the economy with specialists who meet the requirements of the digital era.

Digitalization transforms the social paradigm of people's lives. It opens unprecedented opportunities for acquiring new knowledge, expanding horizons, developing new professions and improving skills. There are new social elevators. Geographic horizons of opportunities are expanding. Thanks to more comfortable cities, efficient public institutions and affordable public services, the conditions of everyday life of citizens improve. States that are tuned to innovation and research, like a magnet, attract qualified personnel — a key resource of digital economies [1].

Over the past decades, a number of approaches to the issue of strategic planning of the development of an educational organization have been formed. States that have managed to adapt their educational infrastructure to new needs will be able to significantly strengthen their economic position during the transition to the digital economy. Russia has every chance to maintain its own competitiveness by modernizing education systems and professional retraining [1]. Digitization transforms the social paradigm of people's lives. It opens up unprecedented opportunities for obtaining new knowledge, expanding horizons, learning new professions and raising qualifications. There are new social elevators. Geographic horizons of opportunities are expanding. Thanks to more comfortable cities for life, efficient state institutions and affordable public servants, the living conditions of citizens are improved. Skilled personnel are a key resource for digital economies.

Digital literacy is the most important skill of the 21st century, the basis of security in the information society. Digital literacy should be given special attention with reading, math and science literacy.

While working to improve the educational infrastructure, it is also necessary to create opportunities for self-realization of high-class specialists in Russia.

In addition to modernizing the system of personnel training, it is also necessary to ensure the possibility of their self-realization in Russia. Highly qualified Russian digital technology specialists trained in the domestic educational system are in high demand not only in Russia but also abroad: according to estimates of a merger of companies software developers of NP "Russoft", in 2015 and the first half of 2016 up to 2 thousand IT professionals left Russia for work in other countries [2].

Despite the fact that according to analysts of Russoft, this number is fully compensated by visiting IT specialists from other countries the most talented and competitive employees with unique knowledge and skills often leave.

In the long term, the Russian education system at all levels needs a more extensive transformation based on such principles as lifelong learning (Lifelong Learning), the flexibility of educational trajectories and modularity of educational courses [2]. At the same time, it is necessary to focus on developing the personal, social skills and skills of the students in solving interdisciplinary tasks oriented to practice, as well as applying modern methods, formats and training tools, including digital educational tools and formats of remote education. It is also important to develop the interaction of educational and research organizations among themselves, with the business community and with state bodies in order to ensure the relevance and importance of educational programs and reduce the time of adaptation of the educational system to market requirements [1].

To ensure the professional development of such personnel in Russia, it is necessary to improve the platforms for interaction between students and potential employers, create favorable conditions for the development of technology companies and start-ups, and take measures to improve the quality of life in the country as a whole.

II. OBJECTIVES AND METHODS

The methodological basis of the research was a systematic approach, cause-and-effect analysis, logicalmathematical modeling, etc. The theoretical basis is the works of leading Russian and foreign researchers. Coordinated, early action to prepare for future changes, as well as retraining and employment of released personnel, will be required from the state, business and educational institutions. In the course of the study, the following methods were used: analysis of official statistical data, sociological research; document analysis method [11]. The relevance of the study is confirmed by statistical data, which suggests that about 600 professions disappeared due to global mechanization and automation in the 20th century. In the 21st century, the situation has not changed — digital technologies, which today are being introduced into almost all spheres of human activity, continue to rapidly send into history entire groups of professions and crafts [8].

III. RESULTS AND DISCUSSION

Today, digital literacy, the desire and willingness to try new methods of solving problems, risk, experiment and create valuable social connections and business partnerships will increasingly become integral attributes of the success of citizens and companies [9]. Digital technologies affect not only the level of development of the state's economy and its defense capability, but, ultimately, the global political processes. Therefore, the state and society need specialists capable of controlling the most complex equipment, instruments and robots in order to remain competitive at the world level.

In the conditions of automation of an increasing number of operations, which led to the complete disappearance of a number of specialties, and a massive shortage of specialists with digital skills, it is necessary to adapt the educational infrastructure to new requirements. In particular, in the system of fundamental education, first of all, it will be necessary to introduce new approaches to learning and ensure a high level of basic digital literacy of the population.

The state will create a foundation for the future, continuing the development of research centers for conducting basic research in the field of computer science and digital business models. The future will also improve the efficiency of the grant allocation system to finance applied research. State co-financing of promising business projects can have the greatest effect. It can be done, for example, through joint ventures or in the form of government orders for the most sought-after areas of digital development. State participation will also help to maintain the necessary high rates of development of the ecosystem for financing promising digital projects, especially during the scaling, production and transition stages [7].

Today, according to some indicators, the Russian education system lags significantly behind the countries digital leaders, which create risks of a shortage of digital personnel in the future. Methods used in domestic education, training formats, educational programs, approaches to interacting with potential employers require adaptation to the needs of the digital economy so that the educational system can continue to train competitive personnel [6]. This task should be considered as a priority, since the presence of a sufficient number of highly qualified "digital" frames is one of the conditions for the successful deployment of new digital technologies in Russia, such as Industry 4.0. With the further digital transformation of industries, the introduction of automation and robotization systems, increased productivity and the replacement of physical service channels with digital ones, more and more jobs may be endangered. According to the McKinsey Global Institute, by 2036, from 2 to 50% of work, expressed in man-hours, can be automated, and by 2066, this proportion can reach from 46 to 99% [10]. Since it is easiest to automate those types of work that require performing predictable repetitive physical operations, as well as information gathering and analyzing activities, first of all this process will affect jobs that require moderate qualifications [3]. The development of strong horizontal links with educational and research organizations, high-tech companies, as well as with government bodies will effectively exchange experience, develop innovative digital solutions common to a particular industry, products and standards, adapt educational programs and develop digital application skills. In addition, the introduction of digital technology leads to a reduction in the number of workers with average qualifications [4]. Robots replace workers on conveyors, and information systems begin to perform operations, for which accountants, secretaries, and other office professionals were previously responsible. On the other hand, digitalization has a positive effect on the labor market due to the emergence of new professions that did not exist before. In addition, the development of Internet platforms increases the mobility of workers. In the future, by collecting information about the need for certain specialists, people will be able to better plan their training and career.

In recent years, the state has been making strategic efforts to bridge the gap between the Russian education system and digital leaders. A reform of secondary education is underway, which has already improved the quality indicators of school education in comparison with previous years. A modernization program for secondary vocational education is being implemented, providing for the active introduction of elements of dual education (a combination of education in an educational institution and in the workplace) and the standards of the international movement WorldSkills that promotes increase the prestige of working professions [4]. In solving the problem of providing the economy with personnel possessing digital technologies, a special role is played by the centers of advanced training and mass retraining of personnel. They will provide new skills to specialists of those companies that are not able to independently organize the process of learning, developing and testing new digital technologies. It is also important to provide adaptation programs for personnel released as a result of process automation and productivity growth.

Today we should focus on the development of personal, social, and practice-oriented interdisciplinary tasks in students as well as on the use of modern methods, formats and teaching tools, including digital educational tools and distant education formats. It is also important to develop the interaction of educational and research organizations among themselves, with the business community and with government bodies to ensure the relevance and importance of educational programs and reduce the time to adapt the educational system to market requirements.

IV. CONCLUSION

Russia has all the necessary prerequisites for further realizing digital potential and accelerating the pace of digitalization. The country has an intellectual and scientific base, supported by a good system of secondary and higher technical education. Its consistency is constantly confirmed by victories in contests in the exact sciences. Russian specialists traditionally have strong skills in applied fields that are in demand in the digital age. These include software development, cybersecurity, and the use of artificial intelligence. The country is actively developing the ICT infrastructure on a national scale, the capacity of its internal market is large, and the potential of digitization of the industrial sector has not yet been fully disclosed. The authorities are aware of the state importance of these tasks and are able to mobilize resources on a national scale to solve them [6].

The digital system is able to bring to a common denominator all stakeholders of the advanced educational

environment. In turn, such coordination is guaranteed to ensure economic growth and development of the state. It means that interest in the formation of a modern digital educational environment is dictated by time and state necessity.

To expand human resources in the field of digital technologies, Russia can also, following the example of other countries, develop a program to attract specialists (students, teachers, experienced professionals, and technological entrepreneurs) from abroad [5]. This will help in a relatively short time to eliminate the shortage of qualified personnel, as well as develop new centers of competence in the most popular technological areas.

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