

Transformation of the Role of Innovations in the State Educational Policy of the Post-pandemic Period

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Abstract: During the forced global lockdown caused by the COVID-19 pandemic, all spheres of public activity underwent global crisis changes. The education sector has also undergone dramatic mutations, moving to digital formats and taking a course on the virtualization trend. Under these conditions, automatically, according to the fundamental theories of cyclical development, the process of generating innovative technologies took place, which in one way or another modified and adapted educational policy to the challenges of the time and the new historical format. But the scientific literature, in practice, does not consider the transformative role of innovation in the context of educational policy in the post-pandemic period. Therefore, the significance of this study lies in an attempt to rethink the role of innovations embodied, including in new technologies, in educational policy. The authors of the study used a wide methodological spectrum, including a comparative analysis of the best practices of world powers and a point sociological study in the format of an expert survey. On the basis of the data obtained, practical recommendations were proposed for determining the priorities of Russia's educational policy in the post-pandemic world from the point of view of the generation and dissemination of innovations.

1 INTRODUCTION

The development of human civilization has always been closely dependent on a number of factors, phenomena and processes that arise both naturally, according to the cycles of socio-economic and political-cultural progress, and spontaneously. Social cataclysms, man-made and natural disasters, and pandemics of various kind of viral infections that claimed millions of lives were unexpected.

The era of modernity is also a part of the next stage of socio-economic development. The beginning of the XXI century. - this is the gradual completion of the long 5 K-wave (based on the theory of N.D. Kondratyev) and the fifth innovation cycle (if we take the theory of J. Schumpeter as a basis). In this context, the outbreak of the COVID-19 coronavirus pandemic in 2019-2020. turned out to be a spontaneous phenomenon that accompanies us today at the crisis point of the depression of both cycles, representing

the main, albeit not natural, result of the cyclical recession.

Despite quarantine measures and large-scale vaccinations, the new infection has not yet been defeated. Over the period of its existence, COVID-19 provoked a systemic crisis in all branches of human activity, critically affecting both the economy and the political environment. No exception, in this case, was the educational policy of states, which, under the onslaught of a highly contagious infection, was forced to undergo almost complete virtualization and a sharp transition to digital spaces, which, in turn, served as an impetus for a fairly rapid generation of all kinds of innovations in this area.

However, the trend towards digital education existed even before the onset of lockdowns, to which full-fledged scientific studies were devoted to interpret and substantiate the observed mutations in educational technologies. During the pandemic, they received renewed attention from the academic

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community, the commercial sector and government agencies. Therefore, the relevance of this study lies in the development of a scientific justification for the transformation of the role of innovation in educational policy. Consequently, the purpose of our study is to identify and analyze innovations and their significance in the state educational policy of the Russian Federation, which is already being implemented in the post-pandemic period.

2 RESEARCH METHODOLOGY

The theoretical and methodological basis of the study was the institutional paradigm, which made it possible to clarify the role of innovation in educational policy. To study the theoretical basis of the problem under consideration, the analysis and structuring of scientific literature on the innovation of educational policy was used. In order to study the world experience of changing the priorities of the state educational policy of foreign countries, as well as the practical implementation of innovative technologies in educational systems, we actively use comparative studies and synthesis together with the historical method to identify qualitative and quantitative changes in retrospect. In addition, in this work, statistical and content analysis was used to study parametric economic indicators and certain regulatory legal acts of the Russian Federation. In addition, an expert survey was conducted aimed at elucidating the role of innovations in state educational policy within the framework of a point sociological study.

3 LITERATURE REVIEW

The main body of scientific literature devoted to technological changes occurring in the mainstream of education as a social phenomenon under the influence of COVID-19 defines them as objects of attention of scientists in the field of educational sciences: Isaeva T.E., Petruneva R.M. and Vasilyeva V.D., Makeeva T.V. and Guryanchik V.N., Radina N.K. and Balakina Yu.V., Sergeeva E.V., Cherkezova S.E., and others. Researchers in the field of pedagogy and psychology write about the new competencies of teachers, electronic pedagogical culture, about the innovative activities and potential of the teacher in the difficult conditions of the pandemic, about the interaction patterns of university staff, about the

psychology of students and their reactions to lockdowns and distance learning.

However, in practice, there is no developed theoretical and methodological base that determines the trends that are observed in innovation processes in the context of educational policy, along with conceptual approaches to assessing the effectiveness of this activity.

Interdisciplinary analysis allows us to consider innovative transformations in educational policy from the point of view of the synthesis of social sciences. Scientists of various directions are puzzled by a number of issues that can be conditionally divided as follows: 1) transformation of the role and model of the university in the post-pandemic world; 2) the functioning of digital educational environments; 3) general issues of theory and practice of the implementation of state educational policy; 4) educational policy as an integral part of the paradigm of innovative development.

Researchers dealing with the first block of questions, for example, Tronina I.A., Tatenko G.I., Bakhtina S.S. , turn their attention to how the university and the academic environment are positioned in the processes of civilizational transition to new forms of cooperation and partnership. In particular, the authors propose a toolkit for diagnosing a university as a regional driver of innovative development. In turn, Bolgov V.V., Garanin M.A., Krasnova E.A. and Khristoforova L.V. conduct in-depth research aimed at clarifying the essence of education after the COVID-19 pandemic, namely, reflecting on where it leads: to a fall or to a jump. They developed two scenarios for the further development of educational systems and the role of universities in them: first, the preservation of the trend of massization and internationalization; the second is the comprehensive development and support of mixed forms of education with the prevalence of online programs.

S.I. Chernykh wrote about the functioning of educational environments. and Borisenko I.G. Researchers identify such important components of the development of digital environments in education as the implementation of STEM (Science, Technology, Engineering, Mathematics) and STEAM (Science, Technology, Engineering, Arts, Mathematics), as well as a number of other concepts that form a system of thinking at a qualitatively different level. and students' perception of the world.

Within the framework of issues related to the implementation of state educational policy, Zhuravleva I.A. gives an expert assessment of its development in a pandemic. In her opinion, the

priority direction of the state educational policy in the context of a large-scale reorientation of the world society to innovative tracks of social progress is to provide universities of different levels with information and resource technologies, without which it is impossible to imagine the development of science and the implementation of their own and custom R&D. In particular, this problem can be traced in the regions, where, often, there is a critical lack of funding.

Finally, Lizunov V.V. writes about the inextricable link between educational and innovation policy, noting that the modern academic environment represented by higher educational institutions has three fundamental missions: educational, research and socially significant. All these missions are aimed at transformative changes and creative transformations in social evolution and at a specific contribution to the socio-economic development of territories, the potential of human capital. Researchers from Kazakhstan Ibatov M.K., Pak Yu.N., Zhetesova G.S. and Pak D.Yu. believe that it is necessary to form entrepreneurial universities that would become catalysts for the knowledge economy. That is, the concept of University 3.0, which goes back to the works of J. Wissem, is to make its functions: training of personnel with higher education, generation of new knowledge and technologies that would ensure socio-economic progress and commercialization of the results of scientific activity. A similar interpretation of the academic sector can already be traced in the structure of the innovation systems of some developed and scientifically successful countries, for example, the USA or Great Britain.

Thus, the analysis of scientific literature makes it possible to identify the main problem segments in educational policy, technological research in which leads to the generation of innovations and their further practical application.

4 RESEARCH RESULTS

It is impossible to consider the transformation of the role of innovative technologies in educational policy objectively without analyzing world experience. Let us dwell on the analysis of the achievements of the United States and China. The selection of these two states from the general list is due to the fact that they are not only geopolitical and economic giants, but also the world's leading leaders in the field of scientific and technological development. Therefore, the experience of these states is the most remarkable,

defining and useful for the implementation of certain trends.

The United States is rightfully one of the most advanced countries in the modern world. According to some estimates, the US GDP in 2021 will be about \$ 22.68 trillion. \$ - almost 1.75 trillion. \$ more than 2020. In addition, the state is ranked 3rd in the Global Innovation Index (GII) 2021, which means that the United States is almost the most innovative country on the planet. The achievement of impressive volumes of GDP and the first positions in the leaders of the Index allow us to assert the effectiveness of the course of the state educational policy and the practical use of innovative technologies in the process of its implementation.

During and after the pandemic, educational policy in the United States undergoes some adjustment and rethinking. Thus, one of its priorities in 2021 is an intensified reorientation of the academic environment towards the implementation of the third mission in the concept of the national innovation system "triple helix". Here, priority is given to commercialization and the use of innovation as a result of educational policy in order to ensure national security. At the same time, the bias is made in favor of STEAM education, which is gaining great popularity among students of all levels. At the same time, the entire educational system can count on significant federal and, to a greater extent, regional assistance in the development of digital infrastructure.

Specific innovations in the mainstream of US education policy are as follows:

- creation and use of cloud data storage with free access for students, students and teachers to educational content, digital profiles, online libraries, including libraries with reference functions based on "rabbit holes";
- application in the field of educational technologies of games and digital metauniverses experimenting with augmented reality, such as Minecraft Earth or the planned multiplayer VR universe of Facebook Horizon, which allows you to fully immerse yourself in educational and working virtuality using spatial sound and Oculus avatars;
- startup Lambda School, selling online programming courses, and charging for them only after the fact of employment for 2 years and in the amount of 17% if the salary exceeds \$ 50 thousand per year. No work - no pay;
- practical implementation of 5G networks and VR / AR technologies in educational processes at all levels of education.

In fact, China is not a country that formally leads in innovative technologies (the country's ranking in the GII 2021 is 12th place), however, the importance of analyzing the experience of the PRC in the problem area is that China is at the forefront of the world not because of innovation as such, but in view of the successful copying of technologies, their functional mimicry and adaptation. According to forecast data, the country's GDP in 2021 will be about 16.64 trillion \$, which makes China, in fact, the second largest economy in the world and, at the same time, one of the most diversified. Achieving similar results in a country where most of the economic sector is under state regulation would not be easy if it were not for the optimal ways to modernize educational policy and train personnel for the digital economy.

Since 2018, the Chinese government has been actively pursuing a policy aimed at Education Information 2.0, which has received an incredible impetus for accelerated development in the context of the pandemic.

As such, innovation in China's educational policy is more process and methodological than technological. However, the PRC has experience in introducing innovative technologies into the education system. For example, the launch in the spring of 2020 of the largest online educational platform iCourse international, which allows you to study online courses from leading universities in China (Beijing, Fudan, Zhejiang). There are 193 courses available in different directions: from medicine and design to economics and virtual modeling.

Russia is neither an innovative nor an economic leader in comparison with the countries discussed above. However, the pandemic did not pose a serious threat to the educational system of the country as a whole, and even contributed to its qualitative modernization and the emergence of unique innovative projects and technologies in the educational policy track. By the Decree of the President of the Russian Federation of July 21, 2020 No. 474 "On the national development goals of the Russian Federation for the period up to 2030", the transition to digital management is designated as one of the leading development trends. Particular emphasis is placed on the management of the quality of education. So, during the pandemic, the leading domestic universities set a course for the active development of digital educational trajectories. This was reflected in the advanced training of university teachers, the development of specialized online courses, the active inclusion of distance technologies

in the educational process and the implementation of remote learning for the contingent of students and listeners.

Thus, the Open Education platform was popularized in the Russian Federation, which presents massive online courses from leading Russian universities. Another major platform, Coursera, has intensified the virtual mobility of universities in the formation of new forms of interaction with foreign partners, which has included courses from the world's leading universities in its functionality.

Particular attention in the state educational policy is paid to the innovative experience of Russian regions. In order to identify it, the authors conducted a sociological study focused on determining the role of innovation in the educational policy of the post-pandemic period. The expert survey was attended by representatives of the scientific and educational community of higher educational institutions of the Rostov region. The results of the survey show that the majority of experts (25%) understand innovation in the context of state educational policy as an innovative and technological organization of educational and scientific activities of a university. The share of experts (11.5%) who reduce innovation to the use of innovative techniques is smaller. Another 7.7% believe that innovation in educational policy is the use of ICT. Summing up, we can conclude that 44% of experts tend to understand innovation in educational policy as innovative ways, tools and methods of organizing the scientific and educational process, including its digitalization (Fig. 1).

The importance of the integrated functioning of all of the above indicators is noted - 40.4% of the respondents. This states the fact that innovation is a collective concept arising from the modifications of all educational components.

Innovative teaching methods deserve separate consideration (Table 1).

48.1% of respondents believe that innovative teaching methods can be reduced to the creation and implementation of interactive curricula, new ways of presenting and presenting educational material, the creation of massive open online courses - MOOCs.

Another 34.6% of experts identified them as the possibility of using Internet sites and 32.7% of those simplified as technologies for organizing students' independent work using electronic educational resources. In fact, digital methods are considered by most experts as innovative mechanisms for organizing the educational process.

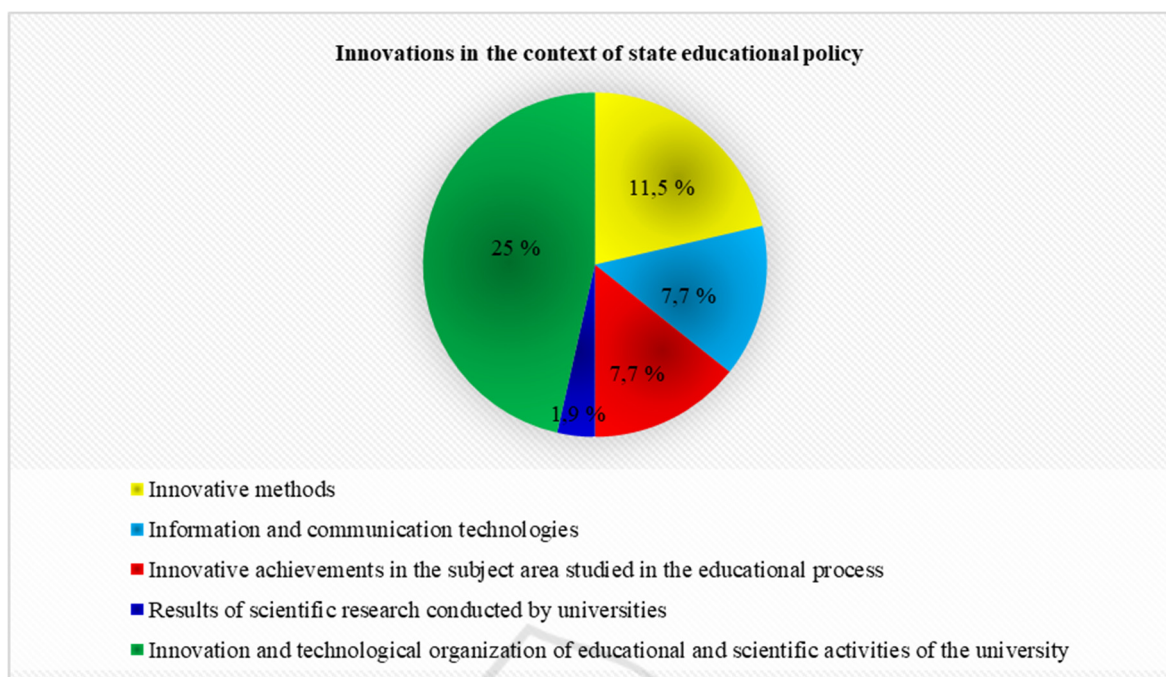


Figure 1: What do respondents understand by innovation in public education policy?

Table 1: Results of experts' answers to the question about the interpretation of the category of innovative teaching methods.

Innovative teaching methods	
Interpretation of the concept	Result
Creation and implementation of interactive educational programs, new ways of presenting and presenting educational material, creation of massive open online courses - MOOCs	48,1 %
Interactive technologies or group teaching methods	36,5 %
The ability to use Internet sites in the educational process	34,6 %
Methodology for using game methods in teaching	32,7 %
The technology of organizing independent work of students using electronic educational resources, electronic educational publications in Course-Lab and Moodle	32,7 %
Case-study as a methodology for solving specific situations - simulation; as simulated learning	26,9 %
Methodology for multimedia project training	23,1 %

Therefore, today it is not enough to traditionally teach students, a teacher needs to continuously improve his skills and abilities, constantly improve his qualifications. All this optimizes the development of our own content and technologies, including procedures, protocols, rules for the implementation of the educational process and regular professional development of teaching staff in the field of distance educational technologies in a remote format. An equally important role in the educational process is played by subject innovations generated within the framework of R&D by university teachers (65.4% according to an expert survey) and formed as a result of R&D of leading universities (55.8%) (Fig. 2.).

5 THE DISCUSSION OF THE RESULTS

The expert survey made it possible to identify areas of the educational and scientific process that should be prioritized. So, it is necessary to pay special attention to the innovative and technological base of the university, which is designed to become the basis for an educational breakthrough. It is proposed to improve the following technological sites:

- to increase the range of innovative material and technical base: quantumiums, technoparks, boiling points (71.2%);

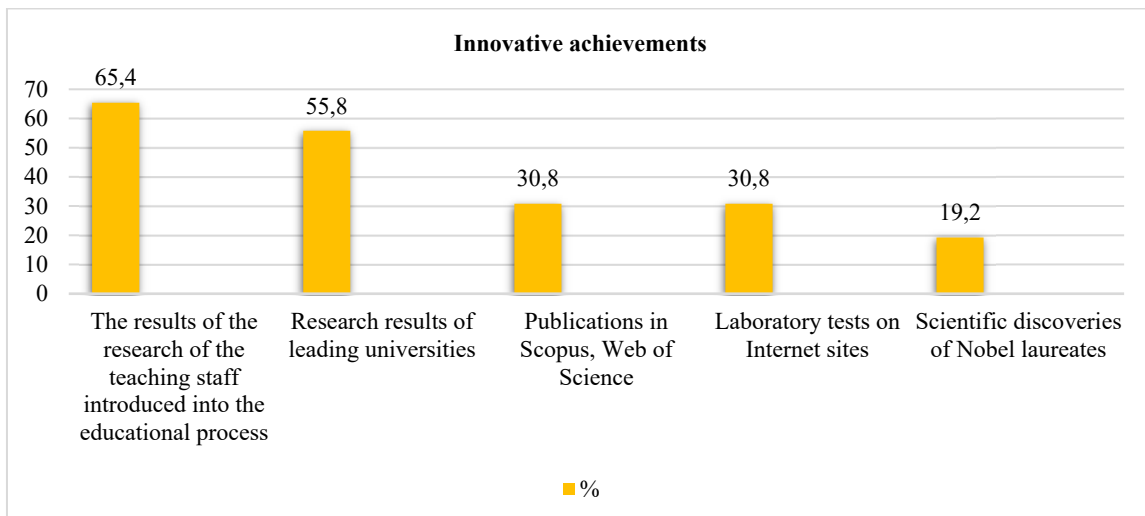


Figure 2: Ingredients of innovation and scientific breakthroughs.

- ensure the availability of special equipment for innovative research (46.2%);
- to create a larger number of scientific laboratories (including interuniversity ones) and technology centers (44.2%);
- to increase the range of jobs and practice bases for undergraduate and graduate students through the creation of firms and joint ventures, including with universities in other countries (34.6%);
- to standardize the system of collective use centers - the Center for Collective Use (11.5%);
- improvement of existing and creation of alternative programs, textbooks, teaching aids and developments, etc. (32.7%);
- export of education (32.7%);
- the organization of experimental work in the educational process (25%);
- development of the continuous education system (23.1%);
- creation of integration educational structures - TSC, technology-innovative zone, business incubators, technology parks; technopolises (19.2%);
- individualization of education through the creation of new educational institutions (17.3%);
- ensuring a dominant position in the integration of educational and research spheres (11.5%).

Changes in the higher education system in Russia after the lifting of restrictive measures related to the pandemic will continue.

First of all, the transformations will affect the requirements for the quality of the digital organization of education and digital competencies of graduates. Of course, the requirements for the teaching staff will also undergo reorganization. Changes are also possible of an organizational nature, for example, a widespread reduction in the number of universities with a parallel possibility of expanding training remotely.

Based on the transformations outlined by us, the directions of improving the state educational policy in the post-pandemic period should become priorities in terms of stimulating innovation, inducing the technological leadership of the Russian Federation. According to the respondents, they should be the following areas:

- introduction of new pedagogical technologies and methods (46.2%);

6 CONCLUSIONS

Summarizing the above, it becomes clear that the process of digital transformation is fundamentally changing the social structure of the higher education system, slowly but surely turning it into a part of the global network space. In a post-pandemic world, the leading position will remain with countries that have achieved digital supremacy and have ensured the integration of the virtual world on their platforms. This circumstance transforms the role of innovation in educational policy, which is becoming a priority area in terms of building the potential for the generation and dissemination of future innovations.

Therefore, innovation is the result of educational activities, on the one hand, and it is an innovative and

technological infrastructure of universities, on the other, capable of reproducing them.

Thus, in the post-pandemic period, the priorities of educational policy from the point of view of the generation and dissemination of innovations should be:

- development of an efficient and effective regulatory framework that provides a qualitative assessment of the process and results of digital education within the framework of state educational policy;
- large-scale digitalization and modernization, both of the organization of the educational and scientific process in universities, as well as technological renewal in them like "smart" campuses;
- creation of our own (national) online educational platforms and bringing them to the world level of competitiveness, as well as to the global markets of IT technologies, software software and the EdTech industry;
- digital export of national higher education in three directions: interstate interaction within the framework of scientific diplomacy and international scientific and technical cooperation, the development of global business networks for Russian companies and the growth of the prestige of the Russian education system;
- designing conditions for the development and continuous improvement of the country's scientific and pedagogical potential;
- popularization of the scientific sphere among the younger generation in order to inflow updated personnel capable of innovative developments, search and implementation of non-standard solutions to existing problems.

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