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## **STATE EDUCATIONAL POLICY IN THE CONTEXT OF DIGITALIZATION OF BELARUSIAN ECONOMY: THEORETICAL ASPECT**

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The current stage of development of both mankind as a whole and Belarusian society in particular is accompanied by radically expanding scales of introducing information and communication technologies (ICT) into various spheres of social life. In socio-humanitarian discourse the given process is known as digitalization that etymologically illustrates both the translation of all types of information (textual, audiovisual) into digital form and emergence and development of appropriate technical tools and means.

In general, the digitalization process differs both on a global scale and with a new quality of changes in various spheres of human life. It leads to a significant expansion of people's communicative capabilities, changes opportunities to conduct their leisure activities, radically transforms the labor market with extermination of old jobs and emergence of new ones. Technological transformations determine the need for both updating of the basic values of society and developing of new rules for the individuals' coexistence in a digital society. This is the only way to practically ensure individual and group freedoms, social justice and solidarity, make technological progress serve the mankind. It all gives rise to research interest in the

phenomenon, determines the unconditional scientific and applied relevance of the topic.

Under intensification of the digitalization process, accompanied by large-scale socio-economic transformations of the modern Belarusian society, spread of technological and social innovations in it, change in the worldview priorities and value attitudes of the individual, there is a need for their timely and adequate reflection by means of higher professional education. Solving of the task meets the targets of the state youth policy that should contribute to the effective professional socialization of the young generation, developing a socially active, responsible and purposeful personality, effective and competitive employee. Therefore, it needs identifying the relationship between digitalization and state educational policy, as effectiveness of implementation of the latter largely determines the level and quality of life of modern Belarusian youth.

In a modern Belarusian expert community, digitalization is considered as a social process being complex in its structure and functions, that by the very fact of its existence acts as a criterion for development of the information society in the country and transnationalization of information communications. The set of digitalization issues is viewed both in a broad and in a narrow theoretical context. In the first case, formation and development of the information society as a qualitatively new stage in the civilizational development of mankind is spoken about (Y. Masuda, F. Ferrarotti, T. Stonier, D. Bell, M. Castells etc.) which Belarus has steadily entered. In the second case, the focus is on the issues of the global economy technological transformation entailed by ICT, as well as risks generated by the given process that directly affect the national economy (N. Negroponte, K. Schwab, W. Wahlster etc.).

For the post-Soviet countries of particular theoretical and applied interest is the issue of digitalization impact on education viewed as a social institution and complex of social practices. The

society's digital transformation means a qualitative change of its economy and production, system of public administration and social sphere. It determines certain requirements for training specialists and employees.

A definite example useful for both Belarus and Ukraine is the experience of digital transformation of Singapore. The given city-state is one of the leaders of economic development around the world, a technological and financial hub for international companies, center for development and sale of innovative IT-technologies in the region (cloud solutions, artificial intellect, big data analysis etc.). For over past twenty years Singapore has not only formed a developed IT-infrastructure, but also created a wide layer of people capable to work in a post-industrial economy and create intellectual products. Moreover, in 2014 Lee Hsien Loong, Prime Minister of Singapore launched the Smart Nation initiative aimed at intensively developing its own IT-sector in the country. The Smart Nation initiative resulted in creating a proving ground for testing technological solutions to urban problems that significantly improves quality of life of the citizens in the given megalopolis. Tens of thousands of sensors installed throughout the country collect all digital data related to housing, utilities and public infrastructure and transmit them to the Smart Nation Sensor Platform (SNSP) to process in real time [190].

Currently Singapore has got 23 roadmaps for digital transformation of 80 sectors of the national economy, the implementation of which is followed by training relevant personnel. As a whole, the volume of investments into Singapore's digital transformation, accumulated in the governmental funds aimed at promoting science and technology in the country, has now reached 19 billion Singapore dollars. At present, in the country there are 55,000 start-ups that successfully operate and with digital solutions and innovative approaches contribute to high rates of inclusive development of the country [193]. As a result, as far as innovation

development is concerned Singapore ranks first in the Asia-Pacific region, according to the 2020 Asian Digital Transformation Index. The latter has again confirmed the high level and decent quality of digital transformation of public administration, urban infrastructure and public life of the country. The experience of Singapore's digital transformation in the context of development and implementation of the state educational policy is of undoubted interest for the Belarusian and Ukrainian systems of higher professional education.

In a modern world human capital is the most important resource for the society's progressive development, and creation of effective tools and mechanisms for its formation and accumulation has become an urgent theoretical and managerial task. Under globalization, the efficiency of the system of higher professional education largely determines the role the country will play in the world labor market – a supplier of highly educated and competitive personnel or their consumer. The effectiveness of its functioning also determines the role of the country in the world R&D market – a center for creating newest technologies or a buyer of any technically complicated goods. In modern conditions the national system of higher professional education is the institution on the activities of which the achievement and maintenance of the Belarusian society's competitiveness on the world stage is dependent to a significant extent.

The system of higher professional education is the sphere that ensures formation, development and accumulation of the society's human capital. The given aspect has drawn research attention to the state educational policy as a nationwide system of goals, values, priorities in the education system, and mechanisms and forms of their practical implementation. It should be underlined that the state educational policy is a complex, multidimensional, multi-subject and historically changeable social phenomenon. It is rightful to say that its influence covers all spheres of life in modern society. To develop and implement an optimal state educational policy, it is necessary to

adequately represent its essence and content, mechanisms of implementation and functions of various actors under the society's digitalization. It is the given aspect that determines a need to identify and scrupulously characterize the basic parameters of the digitalization impact on transformation of the modern Belarusian system of higher professional education.

But development of the national system of higher professional education is a complex, multifactorial and multicomponent process. It cannot be reduced only to the aspects of development of the material and technical infrastructure of the educational system, introduction of modern ICT into the pedagogical practice and increase in the level and quality of professional training of those who work in the system. The given process is not limited either to the issues of improving the scientific and methodological support of the educational process, timely updating the textbooks and curricula, introducing innovative educational technologies into the pedagogical practice, changing the amount of information studied in higher education, introducing new training courses etc.

In the normative aspect education is interpreted as the individual's training and upbringing in the interests of him, society and the state which are oriented to assimilate knowledge, abilities, skills, and form a harmonious, diversified personality of a student at various levels of education. In turn, personal development is determined not only by the informational, technical and technological aspects of the educational process, but also by its axiological component. It is the latter that determines the individual's worldview principles, social attitudes and moral characteristics. In modern pedagogical discourse the semantic form of conceptualization of the given axiological component is the category of educational policy viewed as a nationwide system of goals, values and priorities of education, as well as the corresponding tools and methods of their effective implementation by various social subjects and institutions [75].

From the theoretical viewpoint, the category of educational policy suggests that education is a multidimensional phenomenon being:

- fundamental public good that should be provided to all citizens of a country on a non-market basis;
- non-material resource necessary to achieve social progress by means of development of human capital;
- system of educational and upbringing institutions constituting the infrastructure of the individual's socialization.

In the broad sense educational policy characterizes educational activity carried out by various actors in the space of the entire educational system. In modern Belarusian society, the actors of the kind are the representatives of academic, scientific and professional communities, as well as various institutionalized communities that pursue their interests in the field. In the ideal-typical aspect, such activity is aimed, first, at achieving social justice within the framework of the national educational system. It assumes high accessibility of education to any person. Second, it is a tool for developing the individuals' national and cultural identity within a certain political community. Third, it is oriented to improve quality of education (in content, process and effective aspects) at all levels – from preschool to postgraduate education.

In the narrow sense educational policy presupposes development of a set of competencies the students need both in everyday life and professional activity. According to F. Weinert, competencies are cognitive abilities and skills available or acquired by the individuals to solve particular problems, as well as associated with them motivational, volitional and social skills and abilities for successful and responsible problem-solving in changing situations [196]. From an educational and technological perspective the given process is ensured with rich content of study programs, textbooks and teaching aids, as well as with definite methods of arranging the

educational process. Due to how the functional roles of the state, structures of civil society and economic actors in the field of higher professional education relate to each other, L.L. Shpakovskaya distinguishes three models of educational policy: «market» (Great Britain and the United States), «state» (Scandinavian countries) and «mixed» (Central European countries) [155].

In the epistemological aspect, alongside with the concepts of general and particular, the concept of state educational policy is related to the category of educational policy. The given category characterizes the activity carried out by specialized state bodies and institutions to improve and develop the national educational system and its structural components, as well as the system of measures implemented by the state to optimize the relations in the area of education. In the Republic of Belarus, the state educational policy is determined by the President and implemented and controlled by the Ministry of Education, to which regional education departments and the Education Committee of the Minsk City Executive Committee are reported. According to the Code of the Republic of Belarus on Education, the state policy in education is based on the following principles: priority of education; priority of universal human values, human rights, humanistic nature of education; guarantee of the constitutional right of everyone to education; ensuring equal access to education; compulsory general basic education; integration into the world educational space while maintaining and developing the traditions of the education system; ecological orientation of education; support and development of education taking the tasks of the state's socio-economic development into account; the state-social nature of education management; secular education [4]. In the social aspect the state educational policy involves ensuring equality of educational opportunities, accessibility and quality of education, increasing of educational institutions' financial efficiency.

Thus, for the modern Belarusian state the task of increasing competitiveness and innovativeness of economy actualizes a search for tools for the inclusive socio-economic development and new sources of the GDP growth. The factor of the national economy intensification is digital economy that is considered in the broadest sense as a system of economic, social and cultural relations based on the widest use of information and communication technologies. From the view point of Klaus Schwab, famous German researcher of the information society, the process of digitalization has a complex impact on social institutions and processes in modern society [147].

In Belarus, to intensify development of the digital economy in the country a number of regulatory documents have been adopted that define the appropriate managerial, economic and organizational measures, namely:

- Decree of the President of the Republic of Belarus dated September 22, 2005 No. 12 «On the High-Tech Park»;
- Decree of the President of the Republic of Belarus dated December 21, 2017 No. 8 «On the development of the digital economy»;
- Program of Social and Economic Development of the Republic of Belarus for 2016-2020 approved by the Decree of the President of the Republic of Belarus dated December 15, 2016 No. 466;
- State Program for Development of the Digital Economy and Information Society for 2016-2020 approved by the Resolution of the Council of Ministers of the Republic of Belarus dated March 23, 2016 No. 235;
- State Program «Science-intensive Technologies and Equipment» for 2016-2020 approved by the Resolution of the Council of Ministers of the Republic of Belarus dated April 23, 2016 No. 327;



- State Program of Innovative Development of the Republic of Belarus for 2016-2020 approved by the Decree of the President of the Republic of Belarus dated January 31, 2017 No. 31;

- National Strategy for Sustainable Socio-Economic Development of the Republic of Belarus for the Period up to 2030 approved by the Presidium of the Council of Ministers of the Republic of Belarus (Minutes No. 3 dated February 10, 2015);

- Strategy for Development of Informatization in the Republic of Belarus for 2016-2022 approved by the Presidium of the Council of Ministers of the Republic of Belarus (Minutes No. 26 dated November 3, 2015).

The given regulatory legal documents taken together are aimed at creating preconditions for the transfer of the national economy from the industrial stage of development to the knowledge-based economy grounded on innovations by means of implementing the following measures:

- digital transformation of management processes and decision-making systems;

- modernization of basic industries and accelerated development of new high-tech sectors of the economy;

- reengineering of administrative, organizational and business processes;

- development of the digital infrastructure of the national market, creation of appropriate digital platforms and services;

- stage-by-stage digital transformation of key sectors of the national economy;

- training increased numbers of personnel for high-tech industries and knowledge-intensive industries of the national economy.

In the broad sense digital economy is «part of total production that is wholly or mainly produced with digital technologies by the

firms the business-model of which is based on digital products or services» [30]. In this sense, digital economy acts as a totality of all practices of ICT extensive use. And the difference between ICT intensive and extensive use is as follows: the first involves intensification and modernization of the existing economic activity, and the second one means a qualitative increase in the diversity of economic activity.

The given theoretical interpretation enables to distinguish the following three levels of digital economy:

- first level – digital (IT / ICT) sector that includes the following types of economic activity: manufacturing of components, software and IT-consulting, telecommunications and information services;
- second level – digital economy (network business, platform economy, «sharing» economy, «free earnings» economy and digital services);
- third level – digitalized economy (algorithmic economics, e-commerce, precision agricultural technology and industry 4.0).

But a strict distinction between these levels of digital economy is problematic due to a complex of different reasons (ranging from dynamics of progress in the ICT field to epistemological problems at conceptualizing new types of economic activity).

In general, a transfer of the Belarusian economy to the digital rails through development and implementation of an appropriate economic policy is mandatory due to several aspects.

First, in the context of globalization digitalization of economy is actually a macroeconomic development trend that characterizes the pace and quality of socio-economic development in most countries of the world. According to expert estimates (for example, Boston Consulting Group), digital economy on a global scale demonstrates sustainable growth, immunity to crisis phenomena and provides about one-twentieth of the world's GDP. Meanwhile, in labor market digital

economy creates every twentieth job in science-intensive sectors of economy. On a global scale development of digital economy is mainly distinctive for the countries of the global North, but the corresponding processes in the countries of the global South are rapidly smoothing out the imbalances in socio-economic development.

Second, digitalization of economy qualitatively changes production, logistics, management, service, communication both within the framework of an individual firm and on a wider organizational scale. It reduces companies and firms' transaction costs and expands their access to world markets by minimizing various barriers. Correspondingly, technological simplification of expansion to other markets contributes to growth of their profitability and sales revenue, and in terms of logistics it contributes to efficiency of their supply chain management. For instance, BPM (Business Process Management) automated systems ensure effective functioning of digitized processes, HRM (Human Resources Management) – that of personnel management, CRM (Customer Relationship Management) – that of maintaining communication with customers.

Third, digitalization of economy creates a demand for updating the labor market and training the workforce with the largest possible amount of digital competencies. Due to the scientific and technological progress, labor is becoming more and more intellectual, that's why workers are required not only to have a high level of education but also study throughout their life, constantly and without assistance acquire new knowledge and skills. In the world labor market there is a growing need for highly qualified specialists, the range of new related professions is also expanding that makes it necessary to adjust the educational system for them by implementing various study programs. The workforce is becoming more mobile but access to the best workforce becomes possible by using digital communication channels with workers living in different geographic regions and countries of the world.

For Belarus training specialists on a competency-based approach is very relevant. According to the results of a survey of Belarusian universities graduates in 2014 and 2015, conducted in September 2017 – January 2018 as part of the international technical assistance project of the ERASMUS+ program 574087-EPP-1-2016-1-ES-EPPKA2-CBHE-SP «Fostering Competencies Development in Belarusian Higher Education», the respondents do not always understand the importance of «lifelong education»: 53.2% graduates believe that the existing level of higher education is enough for their work; 23.0% of them need a higher level of education; 7.0% respondents consider a smaller level of education as enough for their work, 5.8% believe that higher education is not necessary (Fig.2.1) [188].

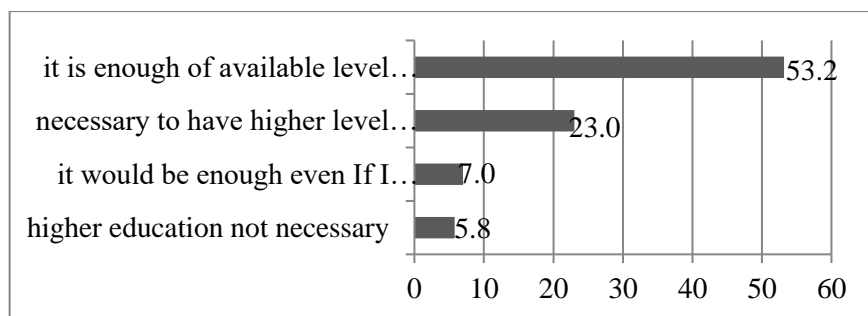


Figure 2.1 Appropriate level of education for the work, in comparison to the graduates' own level of education [188].

Taking into account that digital competencies are developing and improving faster than other competencies, such an attitude of the Belarusian specialists to lifelong learning testifies to the weak points in implementation of the competence-based approach in higher vocational education, declared as the basic one in the Code of the Republic of Belarus on Education, on the one hand. On the other hand, the issues of developing competencies, mainly digital ones, should be

significantly strengthened in the state educational policy that will contribute to a more effective solution of the applied aspects of digitalization of the economy.

Fourth, in public sector digitalization ensures more effective interaction with citizens and private sector. Thus, ICT is a tool for effective arranging of an electronic archive of statistical reporting, managing the data bank of social payments, ensuring the operational and service activities of law enforcement structures etc. In technical terms they create a transparent system of electronic communications that enables to reduce costs of administrative procedures, minimizes corruption and other risks in obtaining public services, contributes to improve efficiency of processes (for example, the electronic document management system greatly simplifies administration, that of data management simplifies identification and analysis of social trends or tax collection).

Fifth, in the applied aspect digitalization of economy enables to ensure a more efficient use of the existing resources that can be considered as a factor in reducing the severity of global environmental problems. A logical ending of digitalization of economy is creation of cyber-physical systems as a form of digitalization of all physical assets and their integration into the global digital ecosystem. Such systems make it possible to connect all structural components of the technological equipment into a total information-telecommunication network that provides logistics for the design, production, marketing and service of goods. In general, cyber-physical systems contribute to both increased productivity of workers and increased national competitiveness. In fact, ICT is an environmentally friendly tool for development, production and service. In the broad sense, for the mankind digitalization of economy creates the preconditions for a radical change in the consumption model in particular and its lifestyle in general.

It should be underlined that practical implementation of digitalization of economy presupposes solution of numerous financial, economic and technological problems, as well as training personnel in the widest range of professions needed by digital economy. In the given case it is necessary to consider the measures for training more personnel for high-tech sectors of the national economy which are implemented in the context of modernizing the state educational policy. These measures can be explicated in a number of Belarusian state programs that become tools of development of digital economy in the country.

The Strategy for Development of Informatization in the Republic of Belarus for 2016-2022 determines that the strategic goal of the further development of informatization in the country is to improve the conditions to foster transformation of the spheres of human activity entailed by the ICT including formation of digital economy, development of the information society and improvement of the electronic government of the Republic of Belarus. To ensure development of the country's human potential a number of measures are envisaged that are within the competence of the educational system and characterize the parameters of the state personnel policy for the medium term. And the level of human development is determined by the population's readiness to use ICT in professional activity and everyday life, as well as by highly qualified specialists available to conduct researches and implement developments in the ICT field, ensure safe operation of information systems. In this case, the principles of lifelong education are actualized that in relation to the higher education system implies the following:

- ensure an effective transition to the strategy of mobile education abandoning strict regulation of the structure and content of curricula and study programs;
- ensure acquiring knowledge and practical skills necessary to use the latest ICT in professional activities;

- reduce the number of ICT specialties significantly and make them wider to improve the classification of higher education in accordance with the International Standard Classification of Education and types of economic activity.

In the system of additional education practical implementation of the principles of lifelong education requires the following measures:

- introducing distance learning, using distance educational technologies;
- developing a certification system for ICT specialists;
- building a multi-level system for improving IT-competencies of civil employees and government officials;
- further ICT training of teachers, lecturers of institutions of vocational, secondary specialized and higher education.

The system of vocational and secondary specialized education announced modernization of the nomenclature of specialties to prepare workers and specialists to use ICTs in various sectors of economy at work in positions that do not require higher education. The State Program of Innovative Development of the Republic of Belarus for 2016-2020 with the goal to ensure high-quality growth and competitiveness of the national economy that concentrates its resources on creating high-tech sectors based on production of V and VI technological levels, determines staffing of the innovative development of the national economy as one of the main directions. In the given case, staffing of the innovative development of the national economy presupposes:

- training specialists for promising sectors of the national economy, primarily high-tech and science-intensive industries;
- building a multilevel system of continuous training, retraining and advanced training of specialists, including civil employees;
- building a republican educational-innovative complex to provide a multi-level system of additional education for managers and

specialists who work for small and medium-sized businesses known as innovative entrepreneurs;

- increasing the prestige of scientific and innovative activities and ensuring the influx of talented youth into the innovation sphere by creating conditions for financial support for the projects from the idea to introduced developments.

To solve the objective of developing and increasing efficiency of the national innovation system functioning it is required to improve the personnel policy in the innovation sphere that implies solution of the following tasks:

- improving quality of training specialists to ensure the innovative development of sectors of the national economy, primarily its high-tech sectors;

- strengthening the integration between industry, science and the system of professional and postgraduate education;

- increasing the prestige of scientific and innovative activities and ensuring the influx of talented youth into the innovation sphere by creating conditions for financial support for the projects from the idea to introduced developments.

The mechanisms for improving the personnel policy in the innovation sphere are as follows:

- creation of educational-production and scientific-production complexes that provide continuous training of specialists in the field of innovation, including those on the basis of a multi-level system of additional education for managers and specialists of small and medium-sized innovative businesses;

- training more engineering-technical specialists and highly qualified scientists in priority specialties that ensure development of high-tech industries related to V and VI technological levels;

- bringing the curricula in line with the requirements of an innovative economy;



- development of a system of forming students' knowledge, skills and abilities of doing business at higher education institutions;
- development of basic and additional education in the area of intellectual property;
- improving the system of training highly qualified specialists and scientific personnel for the needs of the research and production complex, with attracting leading foreign scientists and experts in high technologies to the given process by creating the necessary conditions;
- arrangement of training specialists in innovative skills by implementing international technical assistance projects;
- arrangement of training specialists in the field of invention, innovation and engineering-technical creativity;
- creating organizational and legal conditions to support scientific schools in priority areas of research and scientific-technical activities;
- stimulating young specialists to join postgraduate courses, increasing the level of social protection of young scientists, creating opportunities for their professional development;
- development and state support of the young people's engineering-technical creativity, innovation and invention.

In the context of constructing target priorities for developing the Belarusian system of higher professional education, considered in the context of the formation of students and undergraduates' digital skills [105], it is rightful to talk about the need to implement the following measures:

- increasing the ICT role in the educational process at the secondary education level by combining traditional and digital approaches to teaching, synthesizing formal and non-formal teaching methods, increasing teachers' digital competencies;

- ensuring, according to educational levels, continuity of the content of educational and study documentation and a totality of basic competencies necessary for an employee in a digital economy;
- increasing digital literacy of the population by formal, non-formal and informal learning;
- increasing the share of IT-specialties in the total number of study programs to develop personnel's specialized competencies for the digital economy;
- creation and realization of study programs at the level of higher professional education and additional education using personalized educational routes, a model of network learning and modern educational technologies;
- combining scientific, scientific-technical and innovative components in the educational process at the level of higher professional education and additional education as a means of increasing its effectiveness.

In general, digitalization of the national economy in Belarus requires new approaches to training future employees and it produces a direct impact on the state educational policy. It can be suggested that the state educational policy should solve the tasks of both learners' personal development and training personnel for the high-tech and science-intensive industries in the country and in terms of qualified ICT-users. Their practical achievement will provide training of the employees for digital economy who possess creativity, high adaptive potential, digital competence and professional mobility.