

Information Technologies in Education in Terms of Digital Economics

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Abstract—A new stage of society development is closely connected with digital information processing and use. Digital economics influences all spheres of social relations in the world, including Russia. The authors of the article present the latest results concerning digital economics spread in different countries, including Russia. As a result of information-computer technologies (ICT) wide spread it is necessary to improve the system of education at all levels. The aim of different steps of education is mastering all opportunities of digital technologies and all opportunities of computers. The article is about information technologies development in education, it underlines the importance of informatization and the role of modern technologies in educational process. The article defines the aspects of planning educational environment development in Russia, using new technologies in education in terms of digital economics in the accepted normative-juridical acts.

Keywords—*digital economics; technology; informational society; educational environment; personnel training.*

I. INTRODUCTION

In recent years “digital economics” term is very often used in scientific literature and social-political life of Russia. Modern world quickly plunges into digital environment. If country leaders don’t understand the importance of economics development in modern trends, the country is doomed to be economically backward.

The main aim is to create the society of knowledge in Russia, which is widely spread in developed countries of the world. The integral part of a new information society of knowledge is digital economics, which is defined by the corresponding Program as economic activity of a special kind. At the same time digital data in economics of this type belong to the key factors of industry. It is underlined that information space formation in digital economics is realized taking into account the following: the need of society and citizens for valid and qualitative data; native informative-communicative technologies creation and their use; qualitative information

infrastructure in Russia development; the main technological base creation for social-economic sphere.

Information-computer technologies creation and distribution influenced greatly world economics. As a result, a new phenomenon appears – digital economics. According to the results of Digital Economy and Society Index, DESI, the following countries have the most developed digital economics in 2016: Scandinavia, Benelux, Great Britain and Ireland. 98 % of European Union population has access to the Internet, 84 % has the access to 4G nets, 44 % of population doesn’t have basic digital skills [1].

In Russia the number of people, who have access to Internet increases since 2008 till 2017 from 25,4 till 72,8% in 2017 [2].

In these conditions it is especially important to train specialists, who have wider skills of information-communicative technologies (ICT) use, who are able to handle great amount of information using modern software program.

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In 2017 The Russian Federation Government created and adopted the program of conditions creation for the country transfer to digital economics.

Autonomous non-commercial organization “Digital economics” (Tsifrovaya ekonomika) realized expert and business associations participation in the program effectiveness planning and development. The organization was created by successful Russian highly-technological companies. In the sphere of education the following events are planned in this program:

contest of postgraduate and masters programs was organized according to each direction of “transparent” technologies, taking into account monitoring of the need for personnel in the sphere of “transparent” technologies of digital economics creation;

pilot postgraduate and masters schools were created according to each direction of “transparent” technologies on the basis of the leading higher educational establishments and scientific organizations;

by 2021 the part of educational organizations teaching staff retraining for teaching competencies of digital economics should achieve 100% [13].

II. LITERATURE REVIEW

Informative-communicative technologies use in all sphere of human activity is an extremely important component in modern society. These technologies help not only to increase labor productivity and reduce the outlays on producing different kinds of products, but also create new, earlier impossible technologically productions and products. All this demands all spheres transformation, including education, as there are always needs for new professions development, skills of training change among all specialties – from management to public health.

The skills of mastering digital technologies by specialists of different qualifications demands considerable transformation in educational system in order to achieve three main directions of competence change among workers, who get education:

First, the specialists of a wide range of professions should gain thorough knowledge in the sphere of information-communicative technologies use, in order to get acquainted with the opportunities of searching for information in the Internet and different kinds of software programs use in everyday activity;

Secondly, teaching professional skills of producing new means of labor of digital economics, such as: software programs, web-page of the organization, means of electronic commerce, financial means of analysis with the help of program means of economic calculations support, the Internet, cloud technologies of data holding and others;

Thirdly, digital technologies use with ICT should change the ways, which are used for different objectives fulfillment at each working place, for example, social media use for communication with the clients and staff, products promotion, marketing on the basis of great data analysis and mathematical modeling, projects creation using modern software and etc..

Qualified economic personnel training also demands teaching different ways of ICT use and software for different problems solution, which appear in practical activity of a specialist. In teaching economic disciplines, connected with special skills, such as: accounting, economic activity analysis, business economics, business-planning, investment strategies of enterprise, finances and etc., computer technologies use is conditioned by programs organization and practical material content in order to master professional techniques of an economist and manager. In reality in teaching disciplines of the basic part of economic sciences, which mainly have theoretical character, ICT and modern educational technologies use is presented by projectors for lectures reading, control knowledge testing using computer

technologies, different materials sending to students using net environment of educational establishments.

In 2017 Russia joined the international “Declaration of ministers about digital economics: INNOVATIONS, GROWTH AND SOCIAL WELL-BEING”. It was signed by the representatives of more than 40 developed countries, including the USA and EU countries. They are included into OECD (Organization for Economic Cooperation and Development). The degree of computer technologies mastering skills analysis, held in OECD countries, showed that in the average more than 40% of workers, who use PC every day, don’t have sufficient knowledge concerning software program.

In the Strategy of the Russian Federation scientific-technological development, as one of the main documents on digital economics, adopted in Russia, it is mentioned that important factors of new digital reality, which demand great changes in the system of personnel training according to all specialties are the following: innovative cycle compression: considerable time period decrease between new knowledge getting and technologies, products and services creation, their release; scientific-technological information volume increase, extremely new ways of work with information appearance; the demands increase placed on qualification of the research workers, international competition for talented, highly-qualified workers and their involvement into science, engineering, technical business.

All developed countries have this orientation. For example, in 2016 Barack Obama in his President’s address appealed to quick and effective Computer Science (CS) for All teaching, both at schools and Universities, by the specialists of any professions as the second education.

For this objective realization the USA Government allocated 4 billion dollars to train 50000 teachers according to CS for schools and colleges of the USA. This experience should be used in Russia [6].

Nowadays the process of society informatization became so great (and continues to grow) that this process is connected with absolutely all spheres of life. Education is a very important sphere for the state. The process of informatization penetrates deeper and deeper into this sphere.

Speaking about information technologies it is necessary to give their definition – processes, the methods of searching, information collection, storage, handling, giving, distribution and the ways of such processes and methods realization. IT application in education was by the Law of the Russian Federation “On education” 1992 (with amendments in the Law and the Ministry of education and science decree of Russia of 6.05.2005 “On distance educational technologies use”). Nowadays great attention to information technologies use in the sphere of education in Russia is paid by the Federal law of 29.12.2012 N 273-FZ (redaction 29.07.2017) “On education in the Russian Federation” for example, page 16 Educational programs realization using electronic education and distance educational technologies).

III. RESULTS

During education informatization, in our opinion, it is necessary to take into consideration several aspects: economical- informatization financing, equipment buying, teaching personnel of educational establishments and students and etc., methodological- principles creation, which correspond with modern education; technical- soft-hardware technologies creation and introduction, which realize information technologies, incompatible products combining into an integral system; legislative – normative-judicial base creation, which regulates all moments of IT use in education; organizational- trainings and courses of qualification improvement organization for teachers.

Information technology means in education can be divided into several kinds: teaching, training simulators, referential, imitating, demonstrating, laboratory, modeling. Teaching ones are directed toward knowledge transfer and the skill formation to master information. Training simulators give an opportunity to train the received abilities and skills before practice. Referential ones give systematized information. Imitating give an opportunity to study some aspect of reality more thoroughly. Demonstrating ones visualize the studied objects. Laboratory ones develop the process of practical works fulfillment. Modeling ones help to model the objects in order to study them further.

Constant computers development helps to create new technologies in different spheres, both of scientific and practical activity. Among such spheres we can define education, connected with the processes of preservation and transfer realization according to systematized knowledge, skills and abilities among one generations to others. In new non-traditional information systems there is a direct connection with teaching [14,15,16,17].

IV. CONCLUSION

In PC we can define some characteristics, which differ from other technical means of teaching: interactive (dialogue) mode use, availability and compactness, which gives an opportunity to provide the whole classes with them, great opportunities for graphic materials demonstration, means for man-mechanism dialogues realization, opportunities for quick information distribution among users, convenience concerning information storage.

From point of view of technical opportunities, computers, as teaching means, lead to the following: educational process becomes more active, dynamic, as every student has its own PC. The process of teaching becomes individualized, material is visualized, students get more opportunities for practical skills improvement and as a result there is students' interest increase in lessons.

In terms of digital economics education is paid great attention to. Personnel training for digital economics starts from informational education at school and then at college and higher educational establishment. Then it goes into scientific and project organizations.

Information-computer technologies use during education gives new opportunities for students' creative potential development according to the following directions:

students' motivation and interest in mastering digital technologies increases;

new material is mastered as students become active participants of educational process;

the skills are developed to use different methods of logic and mathematical thinking: analysis, modeling, comparison, summarizing, induction, deduction, methods of higher mathematics, mathematical statistics and etc.;

during the Internet use, as the source of legislative and normative information, the skills of independent information study and analysis are mastered in order to use them in all necessary cases;

the methods of ICT use in difficult practical situations are applied;

the level of communication between students and teachers improves in terms of constant ICT use in educational process.

The role of information technologies increase in teaching shows priorities change in teaching personnel. It is proved by the examples of foreign countries.

The problems of educational system improvement in the epoch of modern digital economics development demands information technologies use broadening during educational process.

Economic disciplines teaching using information technologies from the first steps of teaching, provides training specialists. They are able to work in the economics of new technological generation, with the necessary skills of digital communications.

References

- [1] Buryak V. V. Digital economy: breakthrough technologies in education. *Innovacionnaya nauka* [Innovative science], 2018, 7-8, pp. 55-59.
- [2] Vagurina I. V. Problems of introduction of digital technologies in education. In the collection: Transprofessional as a predictor of socio-professional mobility of the youth Materials of all-Russian (with international participation) scientific-practical conference. Under the editorship of E. F. Zeera, V. S. Tretyakova. 2019, pp. 340-342.
- [3] Kotova L. R. Influence of digital technologies on education. In the collection: view of the XXI century generation on the future of digital economy collection of articles by teachers of the IX International scientific and practical conference "Modern economy: concepts and models of innovative development". 2018, pp. 183-186.
- [4] Filatova O. N., Krupa V. V., Bystrova N. V. Professional education in the strategy of digital technologies development. *Problems of modern pedagogical education*. 2018, 61-2, pp. 200-202.
- [5] Dzobelova V.B. New Ways of Qualified Staff Training by the Example of the Republic of North Ossetia-Alania. *Proceedings of 2018 17th Russian Scientific and Practical Conference on Planning and Teaching Engineering Staff for the Industrial and Economic Complex of the Region, PTES 2018*, pp. 23-28.
- [6] Dzobelova V.B., Olisaeva A.V. Staffing Needs in the Regional Economy under the Modern Conditions of Labor Market. *Proceedings of 2018 17th Russian Scientific and Practical Conference on Planning and Teaching Engineering Staff for the Industrial and Economic Complex of the Region, PTES 2018*, pp. 185-188.

- [7] Dzobelova V.B., Olisaeva A.V. Analysis of innovative development of the NCFD regions in Russia. IDIMT 2018: Strategic Modeling in Management, Economy and Society - 26th Interdisciplinary Information Management Talks, 2018, pp. 473-479.
- [8] Olisaeva A.V., Dzobelova V.D., Yablochnikov S.L., Cherkasova O., Davletbayeva N. Formation and development of the digital economy in modern conditions -development within the framework of industry 4.0 In the collection: IDIMT-2019. Innovation and Transformation in a Digital World TRAUNER Druck GmbH & Co KG, Linz. 2019, pp. 83-88.
- [9] Rysin Y.S., Terekhov A.N., Yablochnikov S.L., Ievlev O.P., Dzobelova V.B. On the Issue of Speaker's Identification in Communication Networks and Terminal Equipment of Onboard System 2019 Systems of Signals Generating and Processing in the Field of on Board Communications, SOSG. 2019.
- [10] Yablochnikov S.L., Yablochnikova I.O., Vidov S.V., Kuptsov M.I., Olisaeva A.V. The Aspects of Modeling Information Processes Realized in Complex Telecommunication Systems. In the collection: Wave Electronics and its Application in Information and Telecommunication Systems, WECONF. 2018, pp. 8604360.
- [11] Digital Economy: Innovation, Growth and Social Prosperity OECD Ministerial Meeting. Cancun, Mexico 21-23 June 2016 [Электронный ресурс]. URL: <http://www.oecd.org/sti/ieconomy/sti-cancun-2016-flyer.pdf> Retrieved: Dec, 2016.
- [12] Sukhomlin V.A. Open system of education as the instrument of digital skills formation. Strategic priorities. 2017, 1, pp. 70-81
- [13] Kupriyanovskiy V.P., Sukhomlin V.A., Dobrynin A.P., Rikov A.N., Shkurov F.V., Drozhzhninov V.I., Fedorova N.O., Namiot D.E. Skills in digital economics and the demands of educational system. International Journal of Open Information Technologies. 2017, 5, pp. 19-25.
- [14] Bondarenko V.M. Worldview approach to "digital economics" formation, development and realization.: Modern IT and IT-education, 2017. URL: https://inecon.org/docs/2017/Bondarenko_IT_2017.pdf. (last accessed date: 31.01.2018).
- [15] Dobrynin A.P. Digital economics – different ways to effective technologies use (BIM, PLM, CAD, IOT, Smart City, BIG DATA and others) - International Journal of Open Information Technologies ISSN: 2307-8162. 2016, vol. 4, no. 1, pp. 4-11.
- [16] Preobrazhenskiy A.P., Choporov O.N. The peculiarities of educational processes quality estimation during training specialists. Science of Krasnoyarsk. 2016, 3-3(26), pp. 186-191.
- [17] Aleksandr S. Kuznetsov. Russian Professor's meeting. Russian Journal of Physical Education and Sport. 2019, 14(1), pp. 17-22. DOI: 10.14526/2070-4798-2019-14-1-18-24