DIGITALIZATION OF EDUCATION AS A DRIVER OF DIGITAL TRANSFORMATION OF UKRAINE

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ABSTRACT

The object of research: the article analyzes the development of the education system of Ukraine, taking into account the potential of digitalization in the context of globalization. A specific object of research is the process of transformation of the education system through the introduction of digital services and technologies.

Investigated problem: in order to conduct a comprehensive assessment of the digitalization potential of the educational system of Ukraine, the disadvantages and advantages of digitalization of educational institutions are analyzed using the example of the implementation of distance learning. The process of digitalization of modern education under the influence of the process of universal computerization and the requirements of the modern information society is considered.

The main scientific results: examples of modern computer technologies that are already used in the learning process, their impact on society are given. The scheme of the implementation of international experience in Ukrainian educational institutions is given, the norms and directives of the EU governments in the formation and development of the European Higher Education Area are analyzed. The description of international projects to be implemented by universities is presented.

The area of practical use of the research results: the elements of E-learning are introduced into the educational process based on the results of the projects, including measures aimed at improving the quality of educational services and the qualifications of the teaching staff: a series of trainings related to modern teaching methods of education, practical seminars for teachers and students, etc.

Innovative technological product: structural model of the functioning of the electronic knowledge platform is presented, elements of the platform for providing educational activities in the field of digitalization in Ukraine are described.

Scope of the innovative technological product: based on a review of publications, regulatory requirements and directives, the article discusses the trends in the process of digital transformation of Ukraine.

1. Introduction

1. 1. The object of research

The object of research in this work is the process of transformation of the education system through the introduction of digital services and technologies.

1. 2. Problem description

Digital transformation is an inevitable process taking place all over the world. Innovations are being introduced into various spheres of human activity, which directs people to new development, improving their knowledge, skills and competencies. At the present stage of development of the Ukrainian economy, the applied aspect of digitalization is becoming particularly relevant. The dynamic changes in the digital economy determine the constant social transformations and change the vision of digitalization. The problem of global digitalization has become the subject of scientific discussion of representatives of various sectoral scientific schools. Thus, the French philosopher Pierre Levy defines digitalization as a new milestone in the anthropological space. In his writings, he not only introduces the concept of the digital era [1], but also predicts the emergence of a "collective digital mind" through the widespread introduction of digital services and artificial intelligence [2]. In turn, the German economist Klaus Schwab considers digitalization as a key factor in changes in the sphere of labor and production [3]. Various applied aspects of digitalization have been investigated by such modern Ukrainian scientists as professors Tetiana Kaganovska, Vasyl Rossikhin and Galyna Rossikhina. In their collective work "Problems of Digitalization of Education in Ukraine", they analyze the prospects for the development of the national education system of Ukraine, taking into account the potential of digitalization [4].

The severity of the scientific problem, the different views on the development of digitalization of society as a whole and education in particular, in turn, updated the team of authors of this work – to explore ways to ensure the quality of digital education and its practical application (digital teacher model; digital educational content development technologies, methods assessment of its quality, means of ensuring the quality of training, prevention of possible risks of its reduction).

1. 3. Proposed solution to the problem

The education system should provide society with a confident transition into the digital age, focused on productivity growth, new types of labor, and human needs. This challenge poses to humanity the era of Industry 4.0. In turn, the informatization of education has created the basis for a transition to a new level, and digital technologies in the modern world are not only a tool but also an environment of existence that opens up new possibilities. The digital environment requires a different, new mentality, a perception of the picture of the world, completely new approaches and forms of working with students, and the teacher itself becomes a guide through the digital world.

The aim of research is analysis of the ways to ensure the quality of digital education and the ways of its practical application, the "depth" and the prospects for introducing digital services in Ukraine, to predict both the positive effect of digitalization processes in education and the possible negative aspects of the subjective perception of a new digital reality by the participants in the learning process.

2. Materials and methods

The methodological basis of research is a set of techniques and methods of scientific knowledge, namely: dialectic, comparative, formal-legal, method of system analysis and synthesis, etc. When conducting research, the dialectic method became the main one, with the help of which the essence of the studied phenomena in the unity of their material content and legal form. The system-structural method makes it possible to disclose and consider the formal and legal content of the digitalization mechanism. The analysis of digitalization in Ukraine in comparison with foreign countries is carried out on the basis of a comparative method. In general, general scientific and special methods are used for a full and comprehensive study of the problem of introducing digital technologies and services in education and modernizing the entire learning process. The dialectical method of scientific knowledge is also used in conjunction with the method of systematization and empirical research (when studying the normative foundations of the conceptual apparatus of digitalization), methods of analysis and synthesis (the formation and development of digital technologies in education based on the rules of transition from simple to complex, from abstract to concrete). The empirical basis of research is the work of domestic and foreign scientists, the base of regulatory acts of state authorities of Ukraine.

3. Results

The world today is digital. In order to have the necessary competencies of the 21st century, children must receive them at school and then use them all their lives. In May 2018, in Paris, representatives of the governments of the EU countries formed the values of the European Higher Education Area, analyzing which it is possible to identify 5 main interesting trends in education and teaching:

1. Internationalization of learning.
2. Digitalization of education.
3. Change the concept of teaching.
4. Improvement of the learning environment.
5. Development and implementation of institutional policies and strategies [4].

In general, the digitalization of education today is the main trend in the development of educational systems in almost all countries of the world and covers all levels – from primary education to doctors of science. Ukraine is also in a general trend: electronic textbooks are being created, interactive whiteboards will appear, electronic document management is being introduced, etc. We are witnesses of how the current level of socio-economic development of mankind is accelerating and requires adaptation to all changes in economic, social, political and cultural life and, as a result, require more and more diverse, multi-level and diverse training from a person. In the current conditions of globalization, any changes apply to Ukraine.

In education today, "distance learning" has become one of the most popular phrases. By Decree of the Cabinet of Ministers of Ukraine No. 211 of March 11, 2020, quarantine was introduced throughout Ukraine [5], which resulted in the transfer of educational institutions to distance learning. To date, the distance form of education has not been widely used in the educational process of both secondary and higher education. It was quarantine that activated the problem of distance learning, showed the real situation and the introduction of quick measures to identify shortcomings in the distance learning process. An example of distance education should be the educational platforms used in higher education institutions.

The main advantage of distance education is its extraterritoriality (i. e. there is no reference to a specific territory). In addition, distance learning offers updated knowledge.

"Pluses" of distance education.

1. Freedom and flexibility of the educational process schedule.
2. Individual pace of learning.
3. Availability of education anywhere in the world through Internet access.
4. Increase in the number of students. People who really want to get an education, but do not have the opportunity to constantly attend the university, are happy to agree to distance learning.
5. Favorable price. Distance education is the most affordable form financially.

"Minuses" of distance education.

1. Exclusion of influence on success.
2. Limited time for communication with classmates and a teacher. And, as a result, fewer answers to exciting questions, less additional information and practical advice.
3. Dependence on access to the Internet.
4. Lack of practical training [6].

The main vectors of the development of digital education are:

a) speed – training keeps up to date, because the usual accumulation of knowledge has long lost its relevance;

b) enthusiasm and motivation are fundamental principles in education, where teachers become coordinators, guiding students online and offline;

c) availability of materials in real time, which simplifies the process of acquiring new knowledge;

d) interdisciplinary content – erases the rigid boundaries between production, business and other areas, therefore, requires the integration of knowledge from different spheres of life [7].

It should be noted that the development of technology leads to the introduction of new teaching tools and makes the learning process more effective. However, the thoughtless use of these tools leads to the opposite effect, when real knowledge is replaced by illusory and learning turns into simple entertainment.

If to consider the specific equipment used in the educational process, then with the development of digital technologies in practice, preference is given to interactive panels containing an embedded computer. Document cameras are widely used, which came to replace the projectors, however, unlike them, have a wider functionality. A modern document camera, in addition to transmitting images of flat objects, can receive and broadcast in real time a clear and sharp image of any object, including acting as an image receiver in a telescope and microscope.

Manufacturers of digital measuring systems have developed educational and methodological support, which offers laboratory work and demonstrations for each sensor, as well as examples of tasks for educational projects that can be offered to students using a digital laboratory. However, in practice, only a few teachers decide to replace the recommended list of laboratory works and the widespread use of digital measuring systems with processing the results of a physical experiment on a computer [8].

In the educational process, institutions actively implementing STEM-oriented teaching methods actively use the BYOD principle, which overcomes the shortage of digital laboratories and equips each student with an environmental research tool. BYOD (Bring Your Own Devices) is the principle of active use of smartphones, laptops, tablets and other digital devices for educational activities. But these devices are not provided by the educational institution, but students' own devices are used. The use of this principle in school is closely related to the use of the principle of polytechnicism and allows to increase the effectiveness of the educational process.

As for the qualitative characteristics of the process of digitalization of education, the solution of the problems of transformation requires the construction of an educational policy at all levels of education. Unfortunately, there is still no holistic document in Ukraine that would regulate educational policy at the state level. The Decree of the President of Ukraine "On the National Strategy for the Development of Education in Ukraine for the Period until 2021" provides for certain provisions governing certain sections of the educational policy, in particular: a section on the informatization of education [9, 10]. Thus, the need for highlighting digital politics as an integral educational policy, and in some cases as its basis is being actualized: the rapid development and active use of digital technologies in all spheres of life "requires" a systematic approach to the transformation of the education system. Digital educational policy affects the education system as a whole and the activities of all participants in the educational process directly depend on it: teachers, students, administration, stakeholders. In addition, digital educational policy is a driving element of a developed country with a high level of economic and social well-being [11]. Despite all the positive consequences of the educational transformation, there are also obstacles to the implementation of such programs and initiatives:

– lack of awareness of the participants in the educational process (primarily the heads of educational institutions) on the nature of digital politics;

– misunderstanding of the importance of implementing digital policy due to insufficient dissemination of the conceptual design framework and coverage of the results;

– lack or limited resources for implementation;

– active resistance to the changes brought about by the implementation of digital politics;

– ineffective management in the implementation of digital policy;

– misunderstanding of the negative consequences in case of failure to implement the tasks of digital policy, etc. [12].

4. Discussion

One of the ways to solve the problem of building an effective digital policy is to study and adapt the experience of other countries, since in line with the deepening of integration processes and the development of the international division of labor, it becomes relevant for countries to pursue a common educational policy, adapt national training systems for radically changing world market conditions, existing in its most dynamic segments of the vocational qualification structure of the workforce [13]. In addition, scientists and representatives of international organizations and leading transnational corporations (Cisco, Intel, Microsoft, Google) pay much attention to the development of recommendations and tools for transforming the education system based on digital [14].

In the EU countries, the situation in the field of digital transformation is slightly better, due to a significantly higher level of digitalization. For example, in Sweden, since the 5th grade, the state has endowed all students with laptops, all subjects (courses) have been digitized and are in

electronic form. However, the school's tradition (class schedule, grading system, transfer to next year, etc.) remains unchanged. In the same way, but with fewer laptops and other gadgets, there is a digitalization of education in other European countries [15–16]. In Ukraine, of course, this process is still far behind the world's best educational practices. But, more importantly, not only in Ukraine, but almost everywhere it is possible to see a number of circumstances that indicate a narrow approach to understanding the prospects and possibilities of digitalization of education. In addition, one should take into account such significant problems of primary and secondary schools that the traditional system of many countries of the world does not solve today: restraining and averaging the intellectual development of the most gifted children, a powerful bureaucratic wall that does not allow them to "skip" through classes, complete their studies much earlier and enter universities at the age of 12–14 years, which, for example, is possible in the USA and China. And this directly affects the competitiveness of the young man in intelligent labor markets.

5. Conclusions

The generalization of foreign and Ukrainian experience, the analysis of ways and instruments of digital transformation of education allows to conclude that the modern education system requires a digital transformation, which can ensure the quality of the educational process. The present requires a transition to a higher level of use of digital technologies in education. In this regard, the school in Ukraine today is being substantially reformed. This requires the introduction of developed forms and training methods that contribute to the formation of the personality of a future specialist. Thanks to the rapid development of digital technologies and modern technology trends, a systematic approach to the transformation of the education system provides for the integrated interaction of all participants in the educational process and the development of a digital educational policy.

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