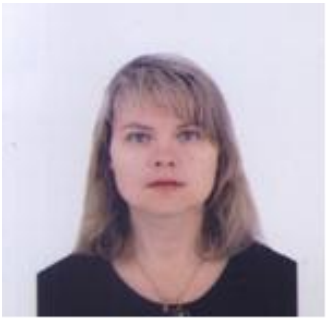
УДК 33:004+378.14:004



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Received 1 October 2020

THE IMPACT OF DIGITALIZATION ON THE EDUCATIONAL ENVIRONMENT[1]

The article considers the material revealing the essence of the educational environment, gives the author's definition of the educational environment as a set of opportunities and competencies that are realized and formed as a result of the educational environment for a student using the means of various information systems; described is the influence of digital technologies on the level of education, which ultimately forms a digital educational environment, as well as a number of factors of the effect of digitalization on the educational environment.
The author concludes that digitalization is not only online courses, distance learning and electronic scheduling, but digitalization is a complex system that shows how the educational process goes, how it affects the quality of the final educational result and what level of required competencies it forms.

Keywords: *digital technologies, digital economy, digital transformation, education system, educational environment, types of educational environments, digital technologies*

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ВЛИЯНИЕ ЦИФРОВИЗАЦИИ НА ОБРАЗОВАТЕЛЬНУЮ СРЕДУ

В статье рассмотрен материал, раскрывающий сущность образовательной среды, дано авторское определение образовательной среды как совокупности возможностей и компетенций, которые реализуются и формируются в результате образовательного окружения для обучающегося посредством различных информационных систем; описано влияние цифровых технологий на уровень образования, что, в конечном счете, формирует цифровую образовательную среду, а также выделен ряд факторов влияния цифровизаии на образовательную среду.
Автор приходит к выводу, что цифровизация – это не только онлайн-курсы, дистанционное обучение и электронное расписание, а цифровизация – это комплексная система, которая показывает, как проходит учебный процесс, как он влияет на качество конечного образовательного результата и какой уровень востребованных компетенций формирует.

[1] Статья публикуется в авторской редакции.

Ключевые слова: *цифровые технологии, цифровая экономика, цифровая трансформация, система образования, образовательная среда, типы образовательных сред, цифровые технологии.*

Introduction. Digitalization today penetrates into all spheres of human activity, leading to the digitization of already existing data and the introduction of digital innovations, which focuses production on a new level of development, on the new quality of the resources used and forces the workforce to improve the existing knowledge and competencies, and also encourages specialists to actively work in various subject areas.

The education system as one of the key (basic) components of the modern economy should ensure the society's transition to a digital economy oriented towards widespread digitalization, including the training of specialists in digital conditions who are proficient in modern technologies, focused on lifelong learning, mainly in a distance format. However, this approach requires a formed high-quality educational environment that would quickly transform in modern conditions and contribute to the formation of the digital economy.

Changes taking place in modern society directly or indirectly affect the educational environment.

Essence and typology of educational environment.

Let's reveal the essence of the category "educational environment", since a number of economists and scientists interpret this concept in different ways.

S.V. Tarasov believes that the educational environment is a subsystem of the socio-cultural environment, a set of historical factors, circumstances, situations or in general is the integrity of specially organized pedagogical conditions for the development of the personality [1, C. 133].

The book "Educational Process in Vocational Education" notes that the educational environment is a system of opportunities that are provided to the student as a necessary set of resources presented by subject-spatial, human, information and technological resources for mastering the process of training and personal-professional development [2].

The pedagogical terminology dictionary gives the following definition [3]: the educational environment is represented by part of the socio-cultural space, the zone of educational systems and their elements, educational material and the interaction of subjects of the educational process.

N.N. Tkachenko, referring to V.I. Panova defines the educational environment as a purposefully modeled environment by an educational institution in accordance with the cognitive interests of students, taking into account the structure and traditions of an educational institution and the entire educational national system, as well as taking into account the capabilities and competencies of the pedagogical staff. Such an environment will make it possible to form priorities in the development of the student and highlight the features and individuality of the young person [4, P.323], [5].

A.A. Andreev argues that the environment should be informational and educational and represent an anthroposophic relevant informational environment designed to unleash the creative potential and talents of the teacher and student.

The educational environment reflects the interaction of modern educational complexes, which are represented by both innovative systems and classical models, complex systems of educational standards, integrating the content of educational programs and plans, high-tech educational tools and educational material, and most importantly, a new quality of relations, which is based on dialogue between students, teachers, representatives of the Ministry, parents, i.e. between all subjects of the education process.

In the context of the transition of the digital economy, we are talking about a digital educational environment, by which we mean an open set of information systems aimed at solving various kinds of problems of the educational process [6]. An open system implies the rights and the possibility of using various information systems as part of a digital educational environment, the ability to replace them or add new ones depending on the tasks set and the degree of their implementation.

The principles of building a digital educational environment should be:

a) Integrity - consistent use in a single educational and technological logic of various digital technologies that solve various educational problems in different parts of the digital educational environment.

b) Openness – expanding the digital educational environment with new technologies, including connecting external systems and mutual exchange of data based on published protocols.

c) Availability – unlimited functionality of both commercial and non-commercial elements of the data center in accordance with the license conditions of each of them for a particular user, usually through the Internet, regardless of the connection method.

d) Competitiveness – the ability to fully or partially replace the digital educational environment with competing technologies.

e) Responsibility – the right, duty and ability of each subject to solve the tasks of informatization in the area of responsibility, including participating in the coordination of tasks for data exchange with related information systems.

f) Sufficiency – conformity of the composition of the information system to the goals, powers and capabilities of the subject for which it was created, without excessive functions and data structures that require unjustified maintenance costs.

g) Usefulness – the formation of new opportunities and reduction of the user's working time due to the introduction of a digital educational environment.

Thus, we come to the understanding that the educational environment is a set of opportunities and competencies that are realized and formed as a result of the educational environment for a student through the means of various information systems; an environment where the interests of the generatrix and the resulting one are integrated, where they jointly study and study a certain subject area and form a certain resource of joint activity.

The educational environment is influenced by a number of factors of both exogenous and endogenous nature.

Returning to the research of S.V. Tarasov, we support his point of view that at all levels of the economy, the educational environment is influenced by factors:

a) At the global level, the educational environment is influenced by global trends, the quality declared by the world public, and the culture of learning, economic and political factors, etc.

b) At the macro level - this is the government's policy in the field of education.

d) At the local level - this is an educational institution and a microclimate in this institution, a family.

Studying the typology, we come to the conclusion that from the proposed classification, one of the key features of the modern educational environment is the interaction of many local educational environments, the mutual use of specific features of innovative environments of one country in the educational space of other countries, which creates almost identical (uniform) educational situations in many countries and stimulates the development of the education sector as a whole. This is a manifestation of trends in the integration of educational processes in different countries and regions into the world educational space [7, S. 130].

As for typology, V.A. Yasvin identifies 4 types of educational environment:

1. Dogmatic or it can still be called the classical educational environment - this type is focused on the educational ideal of a dependent and passive person, where disciplinary measures and strict external control prevail (which can be observed today when receiving secondary education).

2. A serene educational environment is an environment that allows you to educate an autonomous and relatively independent person, but passive, unable to compete and striving for existence in the maximum possible comfort.

3. The career educational environment forms an active and dependent personality, able to adapt quickly and without much effort to changing social relations in modern reality. However, such an environment also has a negative side, since selfishness and indifference to others prevails in the development of the personality [4].

4. The creative (creative) environment allows you to form the freedom of views and social activity of the person, and consciously ensure

the process of self-development of the student [3].

Korchak Ya. also identifies 4 basic models of the educational environment [8], which are close in classification and criterion with the ideas of V.A. Yasvin:

1. A dogmatic environment is an environment that forms a passive and dependent personality.

2. An ideological environment that forms an active and assertive personality focused on action, goodwill, enthusiasm and enthusiasm.

3. A consumption environment is an environment that forms a personality focused on passive consumption, to satisfy only what it has.

4. The environment of success and career - forms an active but dependent personality.

D.B. Berezhnova identifies 3 types of educational environment [9]:

1. Stimulating environment, which creates incentives in educational activities, stimulates activity and self-activity.

2. Information environment – performs the communication function of education and is aimed at transferring the values of this generation.

3. Ecological environment – performs an adaptive function to existing conditions and depends on the characteristics of a person that dominate a certain type of culture.

Digital technology and the educational environment.

The modern educational environment for its functioning requires the introduction of modern digital technologies.

Digital technologies today are declared as one of the tools of digitalization and a significant component of the formation of a new digital type of economy. We believe that digital technologies are also a component that allows you to form an environment and evaluate the emerging learning prospects from different angles: training at a convenient time for the student, the continuity of the knowledge received, simultaneous acquisition of knowledge of different directions and specifics, etc.

Rapid changes in the field of information technology led to the fact that higher education began to be based on educational platforms, which were represented by a built information system that allows developers outside the company, using open tools, to build their own products that can work and interact with other products on that the same platform.

An example is the Coursera International Platform, an online educational project that made it possible to use the popular courses of the best teachers of the world's leading universities and provide access to them to all students free. Alternatively, the EFFOR educational platform, which allowed you to remotely organize group or individual work of learning students, prepare for exams and CTs.

The Belarusian project is «Lyatuchi University», which allows you to study and take courses free. «Netology» is a university for the training and additional training of specialists in the field of digital marketing, project management, design, and interface design and web development. The project's online platform provides free access to 97 mini-courses, and a number of others.

Depending on the purpose of the platform for the organization, for example, distance learning (e.g. Moodle, Claroline, Eliademy) is conditionally divided into:

1. So-called «box services», when the software product for university is provided in a ready form and it only needs to be installed in the educational institution and combined with the existing system.

2. Platforms for conferences, webinars, open lectures, which allows you to solve only certain problems based on the possibility of exchanging information in various ways.

3. SaaScervices are cloud-based technologies that allow you to deploy remote learning on a remote service, and VSS does not provide technical support for the system.

With the development of digital technologies, educational platforms began to be replaced by «ecosystems». An ecosystem is a certain construction of information systems, for the operation of which it is not necessary from third-party developers to use unique tools inherent only to this system for their products: it is enough to implement an agreed data exchange protocol. This makes it possible to ensure the interaction of any information systems if such a protocol is implemented.

The integration of the educational environment and digital technologies also led to the fact that the digital educational environment began to form certain competent requirements

for the teaching staff and for all participants in the educational process.

The professor /teacher today ceases to be a purely knowledge carrier, he should still be a conductor and builder of the digital economy.

Therefore, teachers should have digital literacy, the ability to quickly and efficiently guide the student in the digital space, freely use content to communicate information, have skills in processing it, build educational learning routes individually for each, etc.

Training during the digitalization period is aimed primarily at «lifelong learning» using advanced learning technologies. The forms and methods of conveying information to the student are changing; there is a rethinking of traditional approaches to teaching and the role of the professor in it.

In Russia, for example, a number of universities have chosen a digital transformation model for their university, based on «student-centricity», which is based on the principle of «Student first», and is implemented through the creation of individual educational tracks and the formation of a creative educational environment that helps to reveal the abilities and talents of each student.

As we know, children and adolescents are rapidly adapting to the digital environment, which allows them to form initial digital skills and skills for later development. It should also happen to older educators, that is, they must learn to develop their skills and competencies to instantly navigate the flow of digital information, process it, broadcast it and further integrate it into new digital technology or content.

Determining the need and importance of education in the digital age, higher education institutions began to actively implement the process of creating and using open online courses (resources) to form the necessary competencies for the user.

Abroad, for example, additional areas of digitalization in education are represented by the development of digital libraries and campuses. According to a number of researchers in this subject area, the education system using new technological tools with available information resources will allow us to talk about the effectiveness of introducing digital technologies into the educational process, to create a number of opportunities that were not available under the classical approach in education. Opinions are put forward that students within the framework of a single digital educational environment will be able to independently choose a training course, and accordingly form a set of their own competencies based on the need for the acquired knowledge for further practical activities, the importance and reliability of the acquired knowledge, the ability to realize the acquired knowledge in practical activities, etc.

The educational environment initially lays the foundation for exponentially increasing global modernization. Due to the growing number of digital technologies over time, it will be possible to talk about a new type of person, such as a «digital citizen».

A digital citizen is a person who has moral right and advantages, legal duties and necessary competencies for the use of IT.

Digitalization in education is also changing classical approaches to understanding the workforce. Most recently, it was impossible, being, for example, in Gomel, to get an education in Minsk without leaving work. Today, modern technology has made this form of education a reality. And the work itself became possible «remotely». More recently, in 2018, a survey was conducted in Russia, which showed that the share of Russians using remote access to work was less than 5% of all employed [10]. It was stated that disabled people, students, homemakers, etc., remained outside the labor sphere.

However, the current situation in the economy and the need to use Internet technologies, mobile devices have made such a problem practically not significant for information-intensive activities. Anyone who is able to offer the market any information service and has free time for this, in the digital economy can do this regardless of their social characteristics.

Impact of external factors on the educational environment.

As we have noted above, a number of factors can influence the educational environment. An example is the recent emergence of coronavirus infection, which has adjusted the educational process both at the level of general secondary education and at the level of higher education.

For example, students in higher education institutions were asked to continue the process of obtaining knowledge in a distance form using

the Moodle system. Lectures were given in the Zoom system. This approach blighted and revealed a number of advantages and disadvantages of distance learning and showed how ready teachers and students are for this form of education, and for the government's stated concept of «becoming a digital economy».

Benefits of Remote Approach Training:

1. The tasks issued to each forced all students in the group to do these tasks personally and answer the questions posed.

2. Even those students who did not show activity in the audience were forced to work remotely.

3. The system of accumulating points (credits) became relevant, which allowed students who scored the maximum declared level of points to get a credit in the academic discipline «automatically».

4. Students who received unsatisfactory grades very actively began to practice them.

5. Students have the opportunity to work with the teacher in 24/7 mode.

6. This approach in teaching allowed the monitoring of student attendance at all levels (including the dean and parents).

7. The process of passing exams and tests (within the framework of the anti-corruption program) has become even more transparent.

Shortcomings:

1. The issued tasks and their solutions do not allow teachers to prepare with absolute confidence that the student independently performed the tasks. In addition, students actively used Internet resources and sometimes did not even compile material.

2. Verification of residual knowledge at the exam (standings) when communicating by Internet means revealed the short-lived knowledge and knowledge of the theory, which students could not always apply to solve problems in the discipline studied. There was a principle: he passed the task for verification and forgot.

3. It was not always difficult for successful students to master educational material on their own (especially this was shown by the results of educational disciplines related to solving problems, such as higher mathematics, microeconomics, KIT, etc.).

4. Since the tasks were issued as standard on a particular topic, students broadcast the same material, changing the numbers with the same errors during the decision.

Assessing all the advantages and disadvantages of such training, a number of domestic teachers propose to create an integrated educational platform based on modern information technologies. This approach is justified by the fact that this will help both optimize the work of educational institutions and reduce the paper flow [11], as well as the transition to a single platform of all educational institutions would fully lay the prerequisites for the digital transformation of society.

Using the educational platform will make it possible to apply the accumulated training practices that are already available in the world, and adapt it to domestic realities, develop the functionality of the learning management system: -this is also the registration of students by ICT means, and group administration, and curriculum and certification management, as well as managing the skills and competencies of students, maintaining reporting and analytics, broadcasting and monitoring the educational material to students.

In conclusion, we emphasize that the factors of external influence changed the educational environment and led to the fact that:

– Universities are gradually being transformed into scientific and educational complexes;

– the set task of obtaining higher education everywhere, led to the need for a differentiated approach to building a higher education system in the direction of increasing the number of levels of such education and expanding the ways of obtaining it;

– the expansion of the types of paid services and changes in the methods of budgetary financing made it possible to commercialize the education system;

– obtaining education within the framework of digital transformation has turned education into a continuous process as a result of the exponential growth of the volume of new knowledge and, as a result, the need for constant updating of the knowledge and competencies of employees;

– using information and communication technologies to further develop the distance education system;

– Educational platforms began to function (Coursera, EFFOR, «Lyatuchi University»,

«Netology», etc.), creating competition for the classical form of education;

– the expansion of globalization has led to increased competition between educational institutions for applicants, students, teachers and funding;

– it became possible to introduce artificial intelligence into the educational process [12, C.4].

The joint impact of external factors on the education system determines the need for corrective measures and changes in existing forms and methods of educational activities in the context of digitalization.

Conclusion. Today, the educational environment is a complex system that shows how the educational process goes, how it affects the quality of the final educational result and what level of required competencies forms. Digitalization in the educational environment is the basis of economic progress, to which traditional concepts and models are not applicable. L.V. Shmelkova emphasizes that the most important feature of a person adequate to the digital economy is that this person owns digital technologies, uses them in educational and professional activities [13].

The process of digitalization of education in most universities is carried out mainly in the form of: 1) translation of existing educational material and forms of control into electronic form; 2) formation of interactive electronic environment of interaction between teacher and trainees; 3) creation of electronic types of training tools; 4) creation of fundamentally new forms of training by using the capabilities of the electronic environment; 5) inclusion of artificial intelligence capabilities in the training process.

This approach makes it possible to facilitate students' access to educational materials, reduce the amount of teaching burden, and facilitate control over the content of the curriculum and educational process. In addition, this process allows you to significantly expand the range of remotely offered educational services.

However, following only in the fairway of this course, you can lose your place in the educational services market, since in this case we are not talking about creating a competitive education system in the conditions of digitalization, but about introducing certain digital learning opportunities into the educational process. Meanwhile, one cannot disagree with Johan Wissem's thesis that digitalization education is «a subversive innovation that will inevitably weed out inefficient universities, after which a relatively small number of winning universities will benefit from this new technology» [14, C. 20].

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Статья поступила 1 октября 2020 г.