DIGITAL EDUCATIONAL ENVIRONMENT AS A TOOL OF SYSTEM CHANGES IN THE TEACHER'S PROFESSIONAL ACTIVITY

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Abstract

Purpose: Social and cultural prerequisites of Russia's transition to an open information society have predetermined new requirements for graduates of modern educational organizations, ready for communicative activities in a digital educational environment. Informatization of education is characterized by increasing virtualization of the educational process and, as a consequence, the predominance of fragmented thinking, and increase in the gap between traditional and innovative educational technologies.

Methodology: The basis of the digital educational environment in the context of the use of knowledge management technologies can be specialized knowledge management systems that combine knowledge of related scientific disciplines, which should provide integration, accumulation, and support, as well as the organization of access to knowledge of the educational environment. A distinctive feature of the development of mankind at the present stage is the transition to information society in which information and information processes are becoming one of the most important components of human life and society.

Result: The development of the global process of informatization of society leads to the formation of not only the new information environment for people but also new, information way of their life and professional activities. Many researchers as the most acute problem of modern education called the mismatch of software, including for educational purposes, to high technical characteristics of computers, resulting in extremely low efficiency of computer use in training. Critically assessing the effectiveness of the existing software of the educational process and the ways of its development, we see the prospects for a radical change in the situation in the orientation to the use of knowledge management technologies that use software products that can be changed, adapting to the needs of the user and, in particular, to the didactic tasks of training.

Applications: This research can be used for universities, teachers, and students.

Novelty/Originality: In this research, the model of Digital Educational Environment as a Tool of System Changes in the Teacher's Professional Activity is presented in a comprehensive and complete manner.

Keywords: *Open Information Society, Digital Educational Environment, Knowledge Management, Software.*

INTRODUCTION

Social and cultural prerequisites of Russia's transition to an open information society (mass online education, the totality of the Internet, mobility, digitalization, automation of intellectual operations, technological way) have predetermined new requirements for graduates of modern educational organizations, ready for communicative activities in the digital educational environment (Abdulatipova E.A., Tsakhaeva A.A. 2017).

The key driving forces of the development of modern education are mass online courses, cloud technologies, big data, augmented reality, artificial intelligence, etc. Informatization of education is characterized by the increasing virtualization of the educational process and, as a result, the predominance of fragmented thinking, and an increase in the gap between traditional and innovative educational technologies. These and other risks can be overcome on the basis of the principle of interactivity, which allows ensuring a balance of information-pedagogical and information -computer interaction of students and teachers through the integration of classroom and e-learning technologies in the educational process, implemented with the support of the digital educational environment (Abuzjarova M.I. 2018; Badakhova I.T. 2017). Work in the digital educational environment requires the teacher's practical skills that allow teaching successfully and communicating in the modern digital educational environment, engaging in information interaction using telecommunications, multimedia, Internet services, software, and classroom interactive learning technology. Interest in the problem of improving the digital educational environment is confirmed by numerous practice-oriented publications (about 40 thousand in the database of the scientific electronic library "CyberLeninka"), the use of resources of information systems and information and educational environments as a tool for accreditation of universities, etc. (Bolotin I.S., Mikhaylov A.A., Sorokina N.D. 2017).

RESEARCH METHODOLOGY

Implementation of various types of communication in the information environment is one of the tasks of the state program "Information society" (2011 – 2020). The use of elements of the open information and educational environment "Russian e-school" is defined in the state program "Education development until 2025". The use of information and communication technologies in the activities of the information society is one of the principles of "Strategy of development of the information society in the Russian Federation" (2017 – 2030), the functioning of the electronic information and educational environment in the school with information educational resources and telecommunication technologies is regulated by the Federal Law "On education in the Russian Federation" № 273 and Federal State Educational Standards of secondary general and vocational education. In addition, the Atlas of new professions prepares the training of the modern school graduate as a representative of the digital era of the information society development for future activities in the field of IT-medicine, coordination of the educational online platform, work as a concierge of robotics, infostylistics, media police.

The international study OECD "New millennium learners: a project in progress" substantiates the impact of informatization on the formation of communication skills, especially in areas related to visual-spatial perception and non-verbal thinking.

The international program for the assessment of educational achievements of a high school student PISA (Programme for International Student Assessment) shows a positive correlation between the use of information and educational environment and the formation of communication skills: students with limited access to information and educational environment have the study results by 37% below average in all countries; a small experience of using computer technology in 29% of students led to the implementation of only elementary communicative exercises; reasonable frequency of use of computer technologies influenced on the participants' results of an international study in all countries; lack of confidence in the ability to solve communicative tasks on the Internet had an impact on 13% of the students with the worst results in contrast to the confident people. International research of innovative teaching and Learning-ITL identified the leading role of the formation of communicative skills of students in the global information and educational environment. Thus, for modern education the problem of formation of communicative skills as a core characteristic of an open communicative personality seems appropriate, timely and promising.

The basis of the digital educational environment in terms of the use of knowledge management technologies can be specialized knowledge management systems that combine knowledge of related scientific disciplines. Such systems should provide integration, accumulation, and support, as well as access to knowledge of the educational environment, which allows:

- Combining different sources of information on different disciplines, specialties and participants of the educational process (teachers and students) within a single system;

- Ensuring continuous development of the system by updating theoretical knowledge and continuous accumulation of new experience gained by teachers and students during the educational process;

- Providing relevant information to each of the participants of the educational process in accordance with their knowledge, preferences, and needs.

RESEARCH RESULTS

A distinctive feature of the development of mankind at the present stage is the transition to an information society in which information and information processes are becoming one of the most important components of human life and society. The development of the global process of informatization of society leads to the formation of not only a new information environment for people but also a new, information way of their life and professional activities. A radical change in the way of human existence in the information environment, the realities of scientific, technical and social progress determined the formation of the information society, caused the discrepancy between their content of modern education, the scale and level of development of educational systems. This determined the need to solve the problems of informatization of education, the main results of which are: the development of intellectual, cognitive abilities of the individual; improving the quality and availability of education based on new information technologies in education; the development of open, distance education, providing the choice and implementation of individual educational trajectory of the individual; ensuring continuous education throughout the life of a person due to the need for mobility and adaptability of the individual to the rapidly changing conditions of life-information society; integration into the world educational space on the basis of communication technologies to improve the competitiveness of the person in the world labor market; the formation of a special type of culture of the individual, in demand in the conditions of informatization of education - information culture of the individual, etc (Borisova I.V., Novoseltseva V.N. 2016; Borisova M.V., Musokhranov A.Yu., Sidorova N.A. 2018).

The analysis of the works of A.G. Abrosimov, S.G. Grigoryev, V.V. Grinshkun, Yu.I. Kapustin, A.A. Kuznetsov, M.P. Lapchik, S.I. Makarov, I.V. Robert, N.Kh. Rozov, A.N. Tikhonov, N.F. Talyzina, O.K. Tikhomirov and others allowed identifying the following main functions of the use of information technology in the training of future specialists:

- Information and training function - the acquisition of new scientific and methodological knowledge, the spread of advanced pedagogical technologies;

- Forming function associated with the development of methodological skills, modeling and construction of the studied objects and phenomena, the design of the learning process and its individual elements (content, the form of training, etc.);

- Control and correction function involves the use of knowledge control tools, expert training systems, dialogue solution of practical problems, the use of tools on the type of programmed tasks for feedback, etc.;

- Diagnostic function related to quality control of training;

- Research function is directly related to the formation of the creative abilities of the future specialist (simulation and modeling systems, intellectual and training systems, integrated software packages, creative tasks).

These functions are not isolated, but are interrelated and subject to important requirements dictated by the specifics of training and education, such as the requirements of didactic polyfunctionality, adaptability and interactivity (Borovikova T.V. 2017; Gadzaov A.F., Dzerzhinskaya M.R. 2018; Gadzhieva U.B. 2018; Gasanova P.G., Daudova D.M, Kabieva R.A., Tsahaeva A.A. 2017).

Most researchers (Ilkevich T.G., Medvedkova N.I. 2017; Kuznetsov A.A., Ignatyeva T.A., Kuznetsov A.O. 2018; Morozov I.D., Sapozhnick P.A., Pavlov S.M., Rodionova I.P. 2018; Sergeeva M.G., Trubakova D.I. 2017.) note the contradiction between the increase in the amount and complexity of information that determines the content of education, and limited training time and intellectual abilities of students. I.G. Zakharova emphasizes the contradictions between the conservatism of the education system and the requirements for the level of training of specialists due to the modern level of science and technology, as well as between the need to follow State Educational Standards and ensure the differentiation and individualization of education. S.N. Pozdnyakov notes the contradiction between the motivation of students familiar with the computer environment and the traditional content and methods of training that are offered to them. V.P. Bespalko and S.N. Pozdnyakov explore the contradiction between the pedagogical possibilities of computer technology and the inefficiency of their use in teaching.

The general conclusions contained in these and many other studies can be formulated as follows: to solve the problems and contradictions of modern vocational education, it is necessary to develop a strategy for the formation of the digital educational environment and new methods of its use in the educational process. The main differences are in the interpretation of the digital educational environment and the methods of its formation and use.

In most of the analyzed works, the informatization of education is to the development of appropriate software and private methods of its application in the educational process, without affecting the fundamental problems, goals, content, and objects of learning.

Most researchers treat new information technologies exclusively as computer and communication technologies (A.G. Abrosimov, S.G. Grigoryev, V.V. Grinshkun, Yu.I. Kapustin, S.N. Pozdnyakov, I.V. Robert, etc.). Therefore, the task of modernization of teaching methods and development of new generation textbooks, taking into account the peculiarities of their use in conjunction with e-learning support is not set. Thus, the contradictory and often conflict situation in education, associated with the rupture of intra-disciplinary and intersubject relations, is aggravated. For example, the use of mathematical packages in the display class is in conflict with the traditional content and methods of teaching higher mathematics, as students do not see the need to study many methods of solving problems, because they know that these problems are accurately solved by a computer. On the other hand, students are not interested in studying mathematical packages, because traditional problems considered in mathematical courses do not need computer support to solve them. As a result, the motivation for a deep study of both mathematical methods and mathematical packages is reduced.

The educational information environment is also usually interpreted as a predominantly computer environment (A.A. Andreev, S.L. Atanasyan, Yu.S. Branovsky, I.G. Zakharova, S N. Pozdnyakov, I.V. Robert, etc.), and the problem of integration of computer and traditional segments of the educational environment is formulated only as a problem of their joint use. But such use is extremely difficult due to inconsistency of used didactic principles, methodology and methods, terminology and symbols, as well as incomplete and duplicated information. The problem of integration is aggravated by the fragmentation of the emerging information educational environment generated by the use of commercial software products.

DISCUSSION

Many researchers called the mismatch of software, including educational purposes, to high technical characteristics of computers as the most acute problem of modern education, resulting in extremely low efficiency of computer use in training. In our opinion, the lack of conceptual approaches to the content of training in the new environment and the methodology developed on the basis of such approaches creates a mismatch of software to the new goals and objectives of training.

Critically assessing the effectiveness of the existing software of the educational process and the ways of its development, we see the prospects for a radical change in the situation in the orientation to the use of knowledge management technologies that use software products that can be changed, adapting to the needs of the user and, in particular, to the didactic tasks of training. It is very important that the focus on such technologies is fully consistent with modern pedagogical ideas and makes it easy to implement them due to the fact that programs that implement knowledge management technologies are easily modified. Due to this, each type of computer support becomes plastic, and we have the opportunity to consider the computer as an object of specific pedagogical influence aimed at the development of its software according to the needs of the student and the educational process. Then the learning objectives can be defined in relation to the learner, and to the software of his computer, as well as the ability of the learner to train his computer and use it to perform training and research work, and this applies to both intermediate learning objectives for each discipline of the training cycle, and the ultimate goals of training in accordance with the range of tasks that he will solve in his professional activity. The formation of new learning goals requires the development of methods to control the success of achieving these goals by students, computer and control the effectiveness of their interaction.

When developing specific techniques, it is important to take into account that the specifics of the interaction between the student and the computer is determined by the subject area, level of training and the nature of specific tasks set to the student. The fact is important here that the change of educational elements and technology of training using a computer can be carried out by the teacher only on the basis of the results of their use by a particular student, i.e. when teaching a computer; the student performs the function of the teacher. When solving tasks with the help of computer support, the student is the leader in joint work, and the computer performs the function of an assistant. Finally, when using training and testing computer packages, the computer becomes the host and performs training and (or) controlling functions. Let us note that the functions of the student and the computer can change at different stages of the same task.

When the trainees perform each function, there are additional opportunities for the development of both reproductive and productive (creative) components of training. In addition, there is a new motivation to study, because the student has his own "student", for the training of which it is necessary to understand everything and think it through. S. Papert writes about the role of computer training in the development of the student's intelligence: "When teaching a computer how to think, children join the study of how they think themselves. The experience of such a study turns the child into an epistemologist, a researcher of ways of knowing, not every adult has such experience". It is also important that the implementation of this method of training contributes to the creation of an atmosphere of intellectual comfort because the student has a familiar and formed with his participation information environment and an effective assistant. Accordingly, the teacher has new functions: teaching students the fundamental aspects of the discipline, teaching their computers, consisting in the development and improvement of software, teaching students to use their computers to solve technical (routine) problems. To perform such functions, the teacher may need to cooperate with programmers.

CONCLUSION

The analysis allows concluding that at the present stage of development of the educational process informatization, the task of developing a methodology for the use of knowledge management technologies in the creation of electronic educational resources and their use in the learning process in an educational organization becomes urgent.

The digital educational environment is interpreted by us as the infrastructure of the educational process, which serves, supports the formation of personality in educational activities and includes information, technical and educational-methodical subsystems, orienting its subjects to obtain quality educational results. The digital educational environment as a complex, multi-component system of educational and ICT resources integrates the information system of an educational organization with the pedagogical one, improves the educational activities of students and teachers.

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