METHODOLOGY AND TECHNOLOGY OF E-LEARNING AT DUBNA STATE UNIVERSITY

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This paper presents the main approaches to the organization of e-learning at Dubna State University. The priority project "Modern digital educational environment in the Russian Federation" is intended to create conditions for systematic improvement of the quality and expansion of opportunities for continuing education for all categories of citizens through the development of the Russian digital educational space. To achieve this goal, it is necessary to implement such technologies as e-learning, online training, a massive open online courses (MOOC). In this regard, modernization of vocational education is required, including through the introduction of adaptive, practice-oriented and flexible educational training programs. Over 15 years Dubna State University has been engaged in continuous education of students in a number of areas in the field of information technology and programming based on the use of distance learning technologies.

Keywords: e-learning, educational resources, project-based learning approaches.

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1. Introduction

Modern society is a digital society, so to become its effective user, or rather an effective member, to meet the needs and requirements of the digital economy, it is necessary to understand the structure of information systems and technologies, to be able to apply them in practice in various spheres of human activity. Such a dynamically changing picture of the digital world requires the same dynamics in receiving an education and not only in the field of IT technologies. Changes are also needed for the entire education system. In modern society the training of professionals in the sphere of globalization should also include digital skills and the ability to create and protect intellectual property. In turn, the future of the entire education system directly depends on improving the quality of education and ensuring its accessibility through the introduction of e-learning technologies [1].

Digital technologies have penetrated into all spheres of our life, changed economic and organizational processes, the ways of communication between suppliers and consumers of goods and services. For an integrated assessment of the digital technology diffusion level in the business sector, the Institute for Statistical Studies and Economics of Knowledge (ISSEK, part of the National Research University — Higher School of Economics (HSE)) has developed a business digitalization index that characterizes the speed of adaptation to digital transformation, the level of use of broadband Internet, cloud services, RFID technologies, ERP systems business sector organizations involvement into the e-Commerce. The leading position among the analyzed countries is occupied by Finland with the Index value at the level of 50 points. Russia (28 points) is on a par with such Central and Eastern European countries as Bulgaria, Hungary, Poland and Romania [4].

In accordance with the legislation requirements by the Ministry of Education and Science of the Russian Federation Decree dated January 9, 2014 № 2 "On the affirmation of the order of adaptability e-learning and distance educational technologies by the education organizations into educational programs" there is a need for more active implementation of e-learning in educational process. The road map of the priority project "Modern Digital Educational Environment in the Russian Federation" until 2025 documents a multiple increase in the number of learners enrolled in online courses, the number of students in general education organizations and the number of online courses that ensure the mastery of disciplines (modules) of educational programs for secondary, higher and supplementary education [3].

Thus, any modern state must meet the digital society and its challenges, develop and implement innovative educational technologies that imply the possibility of continuous learning, an individual trajectory of learning materials, access to the world's leading practices, as well as to develop new elements of the educational process – electronic educational resources.

2. E-learning

According to the adopted state standard GOST R 53620, electronic educational resource is a fundamental component of a digital educational platform. Educational organizations are considering various schemes for the inclusion of e-learning in the educational process: from their own developments in Moodle to the introduction of training courses on the open MOOC platforms [5].

Elements of e-learning are used in internal study mode, correspondence education and distance learning, as electronic educational resources have a number of advantages compared to traditional educational resources: low cost, accessibility and ease of information transfer, the ability to access a large number of sources of educational and methodological materials.

One of the niches in e-learning is educational platforms. This is a new concept that can be described as a limited, learner-centered Internet resource dedicated to education and development, containing educational materials and providing them to users on certain conditions. This is a wide range of various projects: from the state-sponsored, organized by the largest universities of a particular country to a small site created by teachers and students in order to study one particular discipline. These Internet projects allow to create a virtual educational space of institutions and making it accessible to all Internet users.

The development of e-learning can provide universities with an increased access to quality higher education and lifelong learning. The growing demand for e-education from various user groups is encourages educational organizations to develop various forms of electronic education.

3. Experience of Dubna State University

For more than 15 years, the Center for Correspondence and Distance Learning at the Institute of System Analysis and Management of Dubna State University has been actively developing and introducing new information technologies into the educational process, improving the distance learning system, expanding the database of on-line courses (nowadays we have more than 100 courses in various areas of training: "Computer science"; "Applied informatics"; "Business informatics", etc.) [2].

The combined form of education, implemented on the basis of LMS Moodle in the Center for Correspondence and Distance Learning, combines the capabilities of the traditional educational process and the advantages of infocommunication educational technologies. Education is based on three components:

-pedagogical – a set of teaching methods and technologies;

-technological – information technology training course development;

-organizational – provide an interaction between all participants of educational process.

To develop high quality modern electronic educational resources at Dubna State University, the Open Educational Technologies Center was created. This center provides technical support for developing and implementation electronic training courses. Also, over the past 2 years, a number of educational projects have been created and actively developing now based on additional education of students: International Engineering School, International IT School "Big Data Analytics", Correspondence School of Physics, Mathematics and Computer Science. The concept of these projects is based on the idea of privileged education. The peculiarity of this project is the selection of applicants for training according to the level of knowledge for inclusion in the educational process in-depth study of the curriculum disciplines, an intensive English course, the possibility of participation in academic competitions and etc. During the training, it is envisaged to involve leading experts and scientists into the learning process, as well as internships and practical training for students at leading companies and enterprises.

Innovative educational technologies are used for the implementation of educational projects, including: personalized educational trajectories; project based learning (integration of education and business); distance learning technologies; e-learning.

Any concept of extensive education involves an increase in the academic workload of students, teachers and classrooms, which creates a new problems associated with the limitation of time and availability. Consider the e-learning possibilities to solve organizing problems of the educational process aimed at training elite graduates, additional education within the concept of an educational project and proficiency enhancement of the academic teaching staff.

4. Methodology and technology of e-learning

The applied e-learning methods are divided according to the main method of delivery and perception of information:

1) "To read" – reading content that can be represented by electronic versions of textbooks, books, monographs or articles. It may be accompanied by illustrations, links to the sites with information resources.
2) "To see" – video materials, which can be in the form of videos, video lectures, webinars or recordings, presentations, etc.
3) "To think" – tasks, tests and questions that serve as feedback and evaluation of educational materials assimilation by learners.

As part of the e-learning introduction into formal education, it is reasonable to revise the structure of traditional teaching materials and educational process organization technologies. It is necessary to involve the student in the process of discussion, controversy and finding an answer to the questions. It is possible to solve this problem by introducing the elements of e-learning "reversed lesson": the student is given theoretical materials to learn it independently, at a convenient time in the Moodle LMS. Theoretical materials posted for self-study should contain some orientation to the problem, task and search for a solution.

Thus, there is another category of methods that are involved in the educational process – "to do". The Workshop method is a completely new form of training. The organization of this form requires a special approach that ensures an intensive interaction of all its participants. The student will be able to show self-sufficiency, initiative and personal interest in the learning process. The theory is delivered in the "background mode" and immediately applied in the practice. This type of training inspires participants, allows them to believe in their own strengths and continue self-improvement. The active technology of this method is virtual and augmented reality. The capabilities of this teaching method allow the student to gain practical skills, get acquainted with the algorithms of behavior in certain situations. The use of modern information technologies in the preparation of educational materials, such as audio, video materials, mobile applications, hypertext, allows you to form an individual learning trajectory, which makes e-learning indispensable in the modern educational process.

The process of interaction between teachers and students of the Institute of System Analysis and Management at the Dubna State University is carried out through the portal (http://isau.ru/). Authorized access to the portal is carried out by logins and passwords of the University's educational network. The portal outcomes the following main tasks:
- automation of communication between teachers and ensuring collaborative work with documents;
- providing an interface for entering the teacher's list of publications and attended conferences into the information-analytical system (IAS);
- exchange of information between teachers and students;
- providing an interface at the IAS for students when filling out diploma and practical training assignments, etc.;
- automation of communication between teachers and students.

Also, the interaction of the IAS with the intramural university analytical information system 1C The University of PROF was organized. It is allows to maintain an up-to-date list of students and study groups.

5. Conclusion

E-learning is part of the digital economy and not only provides access to higher education, but also develops the digital skills and knowledge needed by professionals.

The existing methodology for the use of distance learning technologies at Dubna State University, both in internal study mode and correspondence education, due to the dynamically changing requirements of both the student and the employer will not be able to do without the introduction of e-learning elements. Thus, the creation of educational and methodological materials for their application in the framework of distance or e-learning is an urgent task for the modern education system.

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