

## **NETWORK AND MOBILE TECHNOLOGIES IN THE EDUCATIONAL PROCESS OF THE HEI**

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### **Abstract**

The study is initiated by the formation of new needs of society for the modern educational technologies, improvement of forms and methods of teaching. The article discusses the specifics and possibilities of using network and mobile technologies in the training of students of higher educational institutions. The concepts of network and mobile technologies are clarified; a structural and functional analysis of their characteristics is carried out. The possibilities of the technologies for the revitalization and restructuring of the student learning process are described. The organizational and pedagogical requirements for the effective implementation of network and mobile learning technologies in the mass practice of higher educational institutions are given.

**Keywords:** network technologies, mobile technologies, Federal State Educational Standard of Higher Education (FSES HE), educational process, higher educational institutions (HEI), student.

### **1. INTRODUCTION**

Currently, the specific character of modern reality gives the first place to the focus on continuous life-long learning as a condition of successful life. Education is facing the task of forming a competitive personality which will be successful in the electronic educational environment (Patarakin, 2018).

Special attention is paid to the fact that training methods shall comply with the present trends. Thus, FSES HE have defined the system of modern pedagogical technologies which provide learning in the modern electronic educational system, including e-learning and distance learning technologies, as well as the network form of education (Portal, 2017).

The use of network and mobile technologies in the educational process are aimed at the implementation of this task. Due to the use of these technologies in the educational process, it is possible to restructure and revitalize it in order to improve the quality of students learning, develop their motivation to self-study, form the focus of students on continuous learning.

### **2. NETWORK TECHNOLOGIES IN EDUCATION**

Currently, the number of learning tools used in the educational process, include not only a variety of

equipment and educational visual aids, but also computers, information and telecommunication networks, audiovisual tools, electronic educational and information resources, as these tools contribute to the organization of the network form of educational programs. According to Art. 15 of the "Law on Education in the Russian Federation" (2012) this form provides an opportunity for students to master the educational program using the resources of several organizations engaged in educational activities, including foreign ones.

In accordance with numerous sources *network technologies* are

- A set of standard protocols, as well as software and hardware to ensure functioning of the local computer network (Network Technologies, 2017);
- Technologies connecting information collection, storage, transmission, and processing on a computer with communication technology (Zaitsev, 2014);
- Technologies based on the use of computer networks for the organization of the educational process and independent work of students (Semenova, 2017).

Network technologies allow to fundamentally change the attitude to getting education, the need for continuous life-long improvement of cultural and educational level.

The possibilities of using network technologies in the educational process are the following:

- Availability - students can work with educational resources not only during the training session, but also at any time optimal for them;
- Individualization - through interactive communication with the user, content, methods, and pace of learning activities adapt to student's features, which allows the student to constantly control his/her time and energy;
- Ubiquity - thanks to the development of computer technologies one can work with an educational resource not only from a desktop computer, but also from a mobile phone or tablet, which allows to get access anywhere;
- Revitalization of the learning process - student becomes an active and independent participant of the learning process, he/she develops his/her cognitive interest, increases commitment and motivation;
- Visibility - it is achieved by the use in the educational process of graphic images, animation and video information, which perform an illustrative function, allow to simulate real processes, contribute to the formation of a clear and distinct perception of educational information, the development of creative thinking.

Due to their capabilities, network technologies have found application in all major structural components of the educational process, which are lectures, seminars and workshops, laboratory practices, control system, research and independent work of students. All these forms of arranging the educational process allow to implement in practice a flexible combination of independent cognitive activity of students with different sources of information, operational and systematic interaction with the teacher of the course and group work of students.

The use of network technologies in the educational process allows to revitalize the following aspects of education (Okhota, 2015):

- *Psychological*: influence on student's motivation and his/her attitude to the subject under study, as well as student's readiness to use network technologies;
- *Pedagogical*: compliance of the used network technologies with curriculum requirements, efficiency of network technologies application in the classroom;
- *Methodical*: efficiency of network technologies application in the classroom, choosing of tasks determining the need for network technologies application, methodologically correct presentation of the material;
- *Organizational*: reasonable planning of training sessions, organization of independent and home work of students.

### **3. MOBILE TECHNOLOGIES IN EDUCATION**

The relevance of the development of mobile technologies in education is determined by rapid development of the market economy, the formation of new needs of society in relation to the technologies in modern

education, improvement of educational forms and methods. The development of mobile multimedia services, mobile Internet, broadcast mobile communication directly contributes to mobile learning.

Indeed, mobile technologies give a new quality to the educational process, reflect most fully the trends in the education of a modern person providing constant access to information; they are new tools in the development of the information society which helps to form a new learning environment independent of the time and student's location.

Turning back to the analysis of the concept 'mobile learning' (mLearning, m-learning), we can state a variety of interpretation of its definitions both in foreign and domestic scientific sources. In our opinion, the definitions can be divided into two directions. Definitions of the first direction are focused on the software and hardware issue of mobile learning tools, definitions of the second direction are based on the reflection of didactic and methodological properties and capabilities of mobile technologies. Thus, *mobile learning* is

- A kind of distant learning, for the implementation of which knowledge is transferred to the personal gadgets of a student: laptop, pocket computer or mobile phone (Golitsyna, 2011);
- E-Learning with the help of mobile devices (smartphones, tablets, netbooks, communicators, etc.) not limited by student's location (GOST, 2007);
- E-Learning with the help of mobile devices independent of time and place, using special software on the basis of pedagogic interdisciplinary and modular approaches (Kuklev, 2010);
- Modern ways to support the learning process through mobile technologies, such as portable computers, MP3 players, smartphones, and mobile phones (UNESCO, 2017), etc.

The main characteristic of mobile learning is its implementation "at any time and in any place" which emphasizes the "mobility" feature of this type of learning. In turn, the portable mobile devices make it possible to implement such type of learning.

Definitions of the first direction which reflect the software and hardware component differ from each other by listing out mobile communication devices and their technological capabilities, they do not contain didactic and methodological aspects. However, they can be grouped using two key points: mobile learning is implemented with the use of portable mobile devices; mobile learning requires access to the Internet. As a matter of fact, these features determine the main difference between mobile and other types of learning (electronic, using distant technologies).

The second direction contains definitions reflecting didactic / methodical characteristics of mobile learning. Much attention is paid to improving the efficiency, quality and optimization of the learning processes, expanding the arrangement, modes, and methods of training. Some works emphasize the possibility for the formation of competencies in the field of acquiring and processing educational information (Titova, 2012, Wexler, 2007), others indicate the need to adjust the approaches, methods and content of training (Kuklev, 2010).

In accordance with FSES HE learning in the conditions of the electronic educational environment, which includes electronic educational resources, a set of information technologies, the space for interaction between the participants of the educational process, should be flexible. In this regard mobile learning can be seen both as a condition and as a means of achieving the goals of FSES HE in the context of preparing students for the life in the information society.

Mobile devices allow to overcome almost completely the organizational limits peculiar to the traditional education, without losing the functionality of the training tools used; they allow to remove psychological and organizational barriers and get access to the electronic educational environment at any time. Learning is carried out within student's free time, and the educational strategy is adapted to student's personal needs, characteristics, and interests. Learning technology 'upon request' allows the student to obtain knowledge necessary for him/her at time convenient for him/her. This increases cognitive motivation and potentially increases time available for learning which contributes to his/her efficiency.

The advantage of mobile devices is that they always accompany the modern person, have a small size and can be connected to the Internet almost anywhere; the user can connect anywhere. At the same time, it is possible to work together on the network when several people are working simultaneously on the elaboration of documents in the electronic educational environment. Moreover, within the framework of mobile learning the student is given an opportunity of close communication in educational communities, including teachers, other students and specialists in various fields of knowledge and activities.

#### **4. APPLICATION OF NETWORK AND MOBILE TECHNOLOGIES IN THE EDUCATIONAL PROCESS**

As it was mentioned above, the main opportunities of network technologies application in the educational process include availability, revitalization, and personalization of the learning process, as well as increasing its visibility. Mobile technologies, in turn, provide constant access to information regardless of the time and student's location.

Considering the definitions of mobile technologies, which reflect the software and hardware component, it should be noted that mobile learning involves access to the Internet and the use of resources of the network. That means that mobile technologies are based on network technologies and, therefore, they have all the features of the latter ones.

At the same time, the main advantages of network and mobile learning technologies are

- Enhancing opportunities and ensuring equal access to education for all students, taking into account the diversity of special educational needs and individual opportunities;
- Learning at anytime, in any place, providing immediate access to information needed for a particular work;
- Personalization of learning, diagnostics and taking into account the individual characteristics of students, creation of personal educational space;
- Use of additional features of devices - various sensors for research and educational activities;
- Development of competencies for continuous learning;
- Formation of new educational communities of students and teachers, constant communication with them both offline and online;
- Arranging of group activities based on cloud services, team-work with documents, project managers;
- Support for situational learning, use of possibilities of augmented reality and game educational projects, etc.

But, despite the great similarity, network and mobile technologies cannot be understood as the same thing. The development of mobile technologies has raised the feature of availability and personalization of education to a new level. In our age, a mobile device is not a luxury for a person, but a necessary means of not only communication, but also learning which is always within reach and can be used at any time. Learning with the use of mobile devices is not limited by the location or change of location of the university student.

The effective introduction of network and mobile learning technologies in the mass practice of higher education institutions requires meeting the necessary organizational and pedagogical conditions:

- Provision of software and hardware infrastructure (creation of free Internet access at the university, availability of a large number of mobile services of the organization and support of the educational process, activities, etc. in the electronic educational environment);
- Choosing the ways to use your mobile devices (using BYOD technology (Bring Your Own Device) and/or CYOD technology (Choose Your Own Device, when for the period of studying/work the students and staff are provided with devices acquired by the educational institution in accordance with the information policy));
- Choosing pedagogical technologies (reasonable use of technologies depending on the type of students' activity, educational goals, and planned results; wide implementation of situational learning; focus on active independent work; providing feedback, etc.);
- Creation of special resources for the implementation of mobile learning (support services for educational activities; services of organization and support of the educational process; services for research and project activities; feedback services; store of applications and educational content; general information mobile services; mobile identification and authentication services; mass notification services; intellectual navigation services, etc.);
- Purposeful preparation of scientific and teaching staff for the use of mobile learning;
- Solution of legal and regulatory issues related to information security within an open electronic educational environment.

The use of network and mobile technologies in the learning process contributes to the fact that learning is becoming a universal tool, and the student having the skills to work with these technologies is becoming more adapted to the modern society and more competitive. In addition, network and mobile technologies are becoming a popular alternative to the traditional form of education, a basis for the creation of subject educational content.

## 5. CONCLUSION

Thus, the use of network and mobile technologies in education is a promising area of activity of higher education institutions; it is an important tool for the formation of a new electronic educational environment that allows to bring learning to a higher level. At the same time, the development of methods and technologies of network and mobile learning will contribute to the creation of adaptive personalized learning environments, the establishment of interaction between the teacher and students, the increase of their motivation. The transition to new standards over time in e-learning and mobile learning will develop skills for lifelong learning.

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