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# MOBILE TECHNOLOGIES IN THE HIGHER EDUCATION SYSTEM

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**Abstract:** The article examines aspects of the use of mobile technologies in the higher education system. The advantages and disadvantages of mobile learning are presented. Directions and examples of the application of various mobile services and technologies in educational activities are proposed. It is noted that in the modern educational environment there is still a limited use of mobile technologies, their use as a way to disseminate knowledge, and not as cognitive tools. Today, the most common use of mobile devices is still storing and retrieving information, teaching materials, and scheduling. Several directions of using mobile devices in the learning process have been proposed. The conclusion was made about the novelty of the application and introduction of mobile technologies in the educational environment, the prospects and potential of mobile education in education.

**Keywords:** mobile learning, innovative technologies, e-learning, mobile technologies, mobile applications, educational process.

## INTRODUCTION

The system of higher education in the XXI century. characterized by a rapid pace of development and intensive introduction of information technologies, these processes were the result of the scientific and technological revolution, which entailed the replacement of the industrial society with information. In the context of what is happening, a modern teacher of higher education is in constant search of innovative teaching aids in order to replenish its own arsenal of modern pedagogical technologies that will provide higher professional training for students, but each next wave of the technological revolution passes faster than the previous one, which significantly complicates the selection of technologies.

It is pertinent to note that it is significant in this search to take into account the familiar, accessible environment of the younger generation, which will make it possible to expand the arsenal of teaching aids, therefore, it is necessary to look for

help in processing incoming educational information and in transforming this information into knowledge.

The undeniable fact is that currently the student is equipped with all kinds of mobile devices, thanks to which he is able to be in touch with the whole world, regardless of time and location, which means that young people have the opportunity to access information at any convenient for them place and time. So why shouldn't the teacher take advantage of this circumstance.

Information technologies have entered our lives forever. Every day the number of their users is only growing, in particular, none of us can imagine life without a mobile phone. It is worth leaving him at home for at least a day, and panic already begins. Most often, mobile devices are used as a means of communication between people. Recently, their functionality has expanded significantly. Now with the help of your phone you can access the World Wide Web, take high-quality photos and shoot videos. Cellular companies offer more and more new services and applications every day.

In the modern world, there is a constant process of increasing dependence on communications and access to information, and it is impossible to imagine a person today without a mobile phone or tablet. As the power and potential of mobile devices increase rapidly and the availability of mobile phones becomes ubiquitous, mobile applications are in demand all over the world. Ease of use and variability of application have made mobile technologies a useful tool in the lives of both young people and older people.

The widespread use of smartphones and tablets, their active use in modern society, makes the use of mobile technology in the educational process relevant and in demand.

## **METHODS AND MATERIALS**

Mobile education implies the emergence of a whole range of new teaching and learning methods based on the belief that interaction in a traditional classroom is often not as effective as one would like. Mobile learning can be called “disruptive”

and “paradigm-shifting”, especially when its focus shifts to learning outside the traditional school or to overcome the perceived shortcomings of existing curricula and methods of assessing their effectiveness. Mobile education more closely links learning with life and work, and this type of activity is no longer associated exclusively with a school, university or other stationary institution.

Here are the benefits of mobile learning:

- training without reference to a specific place and time of training;
- lightness, portability and relatively low price of a mobile device;
- availability, simplicity and intuitiveness of technologies;
- training in a convenient mode;
- taking into account the individual characteristics of the student;
- personalization of educational content, taking into account the level of knowledge of the student;
- brevity of educational content;
- support for students with disabilities;
- obtaining permanent access to digital educational content, to control and self-control materials, to personal files from the cloud storage;
- the transition from printed publications to electronic, informational provision of all types of educational activities, the speed of distribution of educational materials among students of all forms of education;
- presentation of information in multimedia format, better assimilation of the material;
- providing educational communications within the group, with a teacher, with educational institutions, with representatives of Uzbek and foreign companies, government and public organizations, the possibility of joint work and performing group assignments;
- continuous advisory support from the teacher;
- moving from information and communication training to interactive, process participants independently create content and share knowledge in collective activities;

- increasing student motivation to learn through introducing elements of youth culture (smartphones, tablets, phablets and other gadgets) into the educational process;

- release of the classroom fund, undemanding computer technology and network equipment.

Despite the indisputable advantages, mobile learning also has a number of significant disadvantages:

- the lack of mobile phones and tablets for some students;
- small screens of mobile devices;
- fast discharge of the battery of portable devices;
- a rapidly changing market for IT devices, increasing technical characteristics, outdated models of mobile devices may not support the latest technologies;

- the need to master the skills of safe online communication and personal data protection;

- lack of educational mobile applications, most of which are in a foreign language;

- not for all disciplines it is possible to choose a suitable mobile application and not all disciplines can be studied using IT devices;

- methodological unpreparedness of teachers to use mobile technologies in education;

- the need to verify the identity of the student when performing remote test tasks and passing the test;

- lack of control over the student's mobile phone, distracting students to information of an entertaining nature.

Mobile technology can be defined as the combination of hardware, operating systems, networking and software that enables technology to be portable. Devices that store these are called mobile devices. Hardware includes PDAs, like Palm Pilot or Handspring, mobile phones, and video game players. Applications are phone books and calendar programmers. In the last decade or so, the availability of mobile

technologies amongst humans has increased. Many people, nowadays own at least one mobile device. Although features differ amongst mobile devices, most could have some of the following features: camera, video support, games, email, Internet, SMS, MMS, uploading and storing information and support for apps which add additional functionality to the core functions of the device. These features may assist us in combining work, study and leisure time in meaningful ways.

Mobile technology can then be used in education in many different ways and these include, recording lectures, accessing blogs, conducting online research, downloading study materials, practical sessions and simulations in and outside the classrooms and communication purposes.

A computer and a laptop have become a necessary educational tool for students (schoolchildren, students), but much more often in the modern world we can meet a schoolchild with a telephone or pocket computer. Therefore, we can conclude that such mobile devices are more convenient, have much more reasonable prices than desktop computers and use a less expensive method of accessing the Internet. In the modern world, the use of mobile systems in the learning process opens up great opportunities. There is even a special concept of mobile learning (m-learning). The introduction of tablet PCs now allows mobile Internet access with equal, if not more, functionality than desktop computers.

The first way is to use a mobile phone as a means of accessing the global network. It is possible to organize access to specialized sites containing electronic training courses, tests, practical assignments and additional training materials (drawings, photographs, sound and video files). It is also possible to exchange e-mail for educational purposes and exchange instant messages in ICQ, QIP programs, versions of which also exist for mobile phones. Thus, at all stages of training, there are many opportunities for the transfer of information materials to the trainee, as well as control over the entire learning process and help in solving emerging problems.

The second possible use of mobile phones for training is the use of special programs for cell phone platforms that are able to open and view files of office

programs such as Office Word, Power point, Excel. Thus, having such files containing training information in the memory of a mobile phone, you can view their versions adapted specifically for the phone screen, with convenient scroll bars, a suitable font and a user-friendly interface. Also, a source of information can be video and audio files, the player programs for which are in every phone of the last years of release. This opportunity is especially valuable for those wishing to study foreign languages - a huge variety of audio courses and audiobooks are available, including files of different formats and lengths.

Another way to use mobile phones for teaching is through the use of specialized e-textbooks and courses that are adapted for viewing and executing on students' mobile phones. Students are encouraged to download Java applications to their phones, containing, for example, tests in certain subjects, as well as information (electronic textbooks, lecture texts) necessary for their successful implementation. Modern technologies make it quite easy to design and programmatically implement such electronic manuals. The ability to place diagrams, drawings and formulas makes writing e-learning courses for mobile phones universal and applicable absolutely to any subject being studied. It is also possible to implement training programs in a game shell, using the graphics capabilities of phones, but the implementation of such applications is a rather complicated and time-consuming process. As a result, writing e-textbooks and subject-testing programs for mobile phones seems to be a more promising avenue. There are a huge number of special applications for mobile phones, such as calculators of varying degrees of complexity (simple, scientific), office programs for mobile phones, applications containing various tests with answers (for example, for psychologists), etc.

Implementation of a mobile learning system in an application to mobile communication systems is possible in the following options:

- JAVA program as an application to a cell phone, PDA, Smartphone;
- creation of a Web interface for a mobile communication facility as a WAP application;

- creation of a client-server system using a database.

Providing access to the mobile user training system for training and testing purposes only would be a one-way approach. Therefore, the structures of two types Client-trainee (trainees) and Client-teaching (training) are most often used, which expands the capabilities of this system.

Client-teaching grants the teacher the right to modify the database on the subject of study, upload new knowledge to the database. Moreover, the teacher does not need any knowledge in the field of programming, the experience of a user of a cell phone or other means of mobile communication is enough.

Client-trainee is very similar to a cell phone game and consists of connecting to the system, a series of replays of the user interface to access the database, and showing the result.

Currently, the majority of university professors use electronic media together with demonstration tools when giving lectures, speeches, presentations. Even today, however, not all audiences are equipped with the means to read, process and design electronically recorded data. In this regard, a contradiction arises between the storage of the overwhelming majority of materials on various subjects on electronic storage devices and the inability to fully use them in all classrooms.

Another problem is the use of full-fledged distance learning. When organizing this form of education in a classical form, the teacher and students use a desktop personal computer connected to the cable Internet network. In this case, each participant in the learning process is rigidly tied to one place for the duration of the entire lesson, which significantly reduces the effectiveness of the very principle of distance learning.

## **RESULT AND DISCUSSION**

Advances in mobile and wireless technologies have influenced the entire society. Mobile technologies are the term that include wireless technologies and mobile devices. The term wireless refers to technologies that enable communication without cables or cords, mainly through use of radio frequency, Bluetooth or infrared

rays. Wireless communications are managed via networks and one of the most available, widespread and known network technology is the Internet. M Learning resources depend on access to the Internet to exchange information and access up-to-date information. There are several standards that enable mobile devices to access network without plugging into a land line connection.

The second technological key component of mobile technologies is mobile devices. According to Peters there are three criteria to determine whether devices should be classified as mobile technology or not:

- small enough to be easily carried,
- capable of providing communication and/or information functions,
- can be used (at least part of the time) without a physical connection to fixed power or telecommunications services.

Using these criteria and for the sake of our research, under the terms of mobile devices we considered smartphones and tablets.

The growth of mobile technologies presents a huge opportunity for the delivery of learning via devices such as smartphones and tablets. The new generation of mobile devices makes it possible for students to learn, collaborate, and share ideas with each other at anytime and anywhere and has become an important educational technology component in higher education. The educational use of digital mobile technology is known as mobile learning or m-learning.

The use of mobile devices will allow solving the following tasks:

- Provide quick access to educational and reference resources of local networks and the Internet. Teachers and students can get the necessary help information at any time without using additional devices. Often during a lecture, a teacher needs not only to answer students' questions, but also to clearly demonstrate the answers, which may contain photo, video and audio data. Students during the implementation of practical and laboratory work can access the reference information necessary to complete the assignments. Mobile devices provide Internet access that is independent of the local network, local servers and gateways.

- To organize the interaction of the teacher with the students in real time. In a large classroom, not every student has the opportunity to ask a question and get an immediate answer. Mobile systems equipped with a special application capable of transmitting a question and receiving a short unambiguous answer in

in real time, will strengthen the feedback in the educational process.

- Provide the opportunity to demonstrate lecture material. Today, far from all classrooms are equipped with modern means for demonstrating educational material: projectors with a connected computer, monitors, interactive whiteboards. Mobile devices allow the presentation of lecture material by transmitting data directly to students' phones or to a projector or TV screen. In the latter case, the teacher does not need to carry a laptop with him or contact the administration of the educational institution with a request to provide a computer.

- Provide the possibility of training without being tied to a specific place, and in some cases, the time of training. The solution to this problem will significantly increase the effectiveness of distance learning.

- Provide an opportunity to perform work using software tools in classrooms that are not equipped with computer equipment. The use of mobile devices in this direction will reduce the dependence of the place and time of classes on the location of computer classes and their workload.

The negative aspects of mobile learning include:

- some trainees lack technical means with the necessary set of functions;  
- poor methodological preparation of teachers for the introduction of mobile devices in the educational process;

- insufficient readiness of training mobile resources and programs for trainees in various areas

educational activities;

- the fact that mobile devices provoke students and schoolchildren into entertainment activities

during the educational process (games, communication, watching video and audio resources);

- small size and low screen resolution.

To date, only the last two points can be classified as difficult to remove.

Currently, there are many positive aspects of the use of modern information technologies in the educational process. This applies not so much to institutions of general and specialized secondary education, but also to universities that widely use achievements in this area. They help students to assimilate the proposed material faster and more efficiently, contribute to the modernization of the educational process, provide an opportunity for distance learning and develop a system of continuous education, make the teaching process more creative, thereby motivating students to work more efficiently and interact with teachers. When organizing the educational process, mobile technologies are most widely used.

Today gadgets are an integral part of our daily life. It is impossible to imagine a student not using mobile devices in the learning process. Preparation of an essay, writing a term paper, communication with classmates, access to lecture and practical materials, participation in seminars and conferences - all this is now possible online thanks to the development of information technology.

Mobile learning has a double benefit: students use it to access books, journals and articles that are difficult enough to collect in one library and have constant access to them. I forgot at home, did not have time to overtake a classmate in the race for the last copy, it is inconvenient to take books of impressive size with me (and, as you know, it is quite difficult for scientists in the field of economic and other sciences to fit all their many years of experience into 7 pages of the report) - now that's it, what is needed to solve the problem fits into a small smartphone with Internet access. The speed, the possible number of users, the capacity of the mobile networks channels is sufficient to implement computer virtualization - a mobile learning opportunity that provides students with remote access to applications from their phones and laptops.

It is customary to call this technology M-learning (from English - mobile learning, which translates as mobile learning) makes it possible to constantly access information, which was previously impossible. This advantage of access is not limited in time and place. However, there is a risk of problems related to the technical aspect of using mobile devices:

- 1) lack of access to the Internet or low transmission speed;
- 2) limited battery life of mobile devices;
- 3) the amount of memory available to the user to save on a specific device;
- 4) insecurity and unreliability of information;
- 5) inconsistency of standards and operating systems;

Computerization of the educational process in general and the independent work of students in particular increases the number of interested and motivated students and allows you to create a single workspace for all participants in the educational process. There is an opinion that for full-time students there is no need for electronic notes. This opinion is erroneous, since it is electronic lectures in a mobile format that are a lifeline for students. Having a mobile course of lectures, students get the opportunity to either prepare in advance and already consciously perceive the knowledge transmitted by the teacher, actively participate in this process, ask questions during the lecture, clarify incomprehensible points, or can correct mistakes in their notes, checking them against the electronic version of the lecture.

Thus, the broad technical and functional capabilities of mobile phones for educational purposes are applied as follows:

- using the possibility of SMS-correspondence or instant messaging with the teacher for consultation;
- the ability to access the global network allows you to visit the necessary sites, exchange e-mail, send the necessary information files;
- passing the test on a mobile phone allows the student to independently control the level of knowledge of the subject;

- electronic textbooks for mobile phones make it possible to receive new information regardless of the time and location of the student;

- the ability to play sound, graphic and video files provide expanded opportunities, especially for teaching language subjects and creative specialties, allows you to use a variety of sources and methods of obtaining knowledge, to interest the student in unusual teaching methods;

- mobile analogs of language dictionaries and reference books, various types of mathematical calculators are convenient to use and can contain more complete and promptly updated information.

## **CONCLUSION**

The use of mobile devices is extremely promising from the point of view of mobility and the possibility of self-learning in situations that were previously unsuitable for this. The use of mobile technologies in full-time education allows not only to effectively organize the independent work of students, but also to increase the motivation of students through the use of new forms and methods of teaching.

For the success of mobile learning, the implementation of pedagogical practices of mobile learning is required as an undoubtedly important direction in the development of the education system; it is necessary to create organizational and methodological conditions for the implementation of mobile learning; we need targeted training of pedagogical personnel for mobile learning: formal (refresher courses, webinars), informal (functioning of networked pedagogical communities). It is necessary to change the attitude towards mobile devices as distracting from educational activities and learn to perceive them as a significant help in the implementation of individual learning paths, in achieving personal, meta-subject and subject educational results, and the student's involvement in creating a learning environment.

Thus, the integration of mobile learning with traditional education is a promising area in the activities of higher educational institutions. The introduction of mobile technologies will increase the efficiency of education, individualize the

learning process, increase the attractiveness of the educational services provided to students, and enhance the competitiveness of the educational institution. With the departure to the mobile sphere, education adapts to the conditions of this environment, becoming more compact, narrowly focused and interactive. The mobile app industry as a whole is profit-driven. This is both the prospect of this market (the application must be effective and interesting in order to be bought) and a number of ethical problems (what behavioral model such programs teach children, should there be some kind of state control in this area).

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### **REFERENCES:**

- [1]. Stevens D., Kitchenham A. (2011). An analysis of mobile learning in education, business, and medicine // Models for interdisciplinary mobile learning: Delivering information to students. Hershey, United States. P. 1-26.
- [2]. Alrasheedi, M., Capretz, L. F., & Raza, A. (2015). A systematic review of the critical factors for success of mobile learning in higher education (university students' perspective). *Journal of Educational Computing Research*, 52(2), 257–276.
- [3]. Al-Emran, M., Elsherif, H. M., & Shaalan, K. (2016). Investigating attitudes towards the use of mobile learning in higher education. *Computers in Human Behavior*, 56, 93-102.
- [4]. Chu, H. C. (2014). Potential Negative Effects of Mobile Learning on Students' Learning Achievement and Cognitive Load--A Format Assessment Perspective. *Journal of Educational Technology & Society*, 17(1).
- [5]. Rakhmatov Dilmurod, Akhatov A., & Rakhmatov D. (2020). Research on Effective Ways to Intelligence Quotient of Perception Through Mobile Games. *The*

American Journal of Applied Sciences, 2(08), 89-95. Retrieved from <https://usajournalshub.com/index.php/tajas/article/view/693>

[6]. Rakhmatov Dilmurod & Nomozova Elmira. (2020). The use of multimedia technologies in the educational system and teaching methodology: problems and prospects. International Journal of Discourse on Innovation, Integration and Education, 1(2), 28-32. Url: <http://summusjournals.com/index.php/ijdiie/article/view/80>

[7]. Rakhmatov Dilmurod & Akhatov Akmal. (2020). Distance learning system in the higher education system of Uzbekistan: hybrid technology. Vol 6 (2020): Conference of Management of Islamic Education Leadership in The Era of Revolution 4.0, 150-153. Retrieved from <https://doi.org/10.21070/icecrs2020575>

[8]. Dilmurod, R., & Fazliddin, A. (2021). Prospects for the introduction of artificial intelligence technologies in higher education. ACADEMICIA: An International Multidisciplinary Research Journal, 11(2), 929-934.

[9]. Kaliisa, R., & Picard, M. (2017). A systematic review on mobile-learning in higher education: The African perspective. The Turkish Online Journal of Educational Technology. 16(1), 1–13.

[10]. Avgoustos T. (2013). State of Mobile Learning Around the World. Global mobile learning and trends. 4-44. China Central Radio & TV University Press.

[11]. Afzalova A. (2012). The use of mobile technologies for the organization of independent work of students. International Electronic Journal “Educational Technology & Society”, 15(4), 497-505.

[12]. Rakhmatov, D. (2021). Til o’rganishda mobil ilovalardan foydalanish imkoniyatlari. Журнал иностранных языков и лингвистики, 2(3).

[13]. Sevillano-Garcia, M. L. and Vazquez-Cano, E. (2015). The impact of digital mobile devices in higher education, Educational Technology & Society, 18(1), p.106-118.

[14]. Wankel, L. A., & Blessinger, P. (2013). New pathways in higher education: An introduction to using mobile technologies. In Increasing student engagement and

retention using mobile applications: Smartphones, Skype and texting technologies (p. 3 17). Emerald Group Publishing Limited.

[15]. Wang, M., Chen, Y. & Khan, M. (2014) Mobile Cloud Learning for Higher Education: A Case Study of Moodle in the Cloud. *The International Review of research in Open and Distance Learning*. Vol 15 (2), pp. 254-26.

[16]. Wu, W., Wu, Y., Chen, C., Kao, H., Lin, C., and Huang, S. (2012). Review of trends from mobile learning studies: A meta-analysis. *Computers & Education* 59, pp. 817–827

[17]. Okazaki, S. (2011). Teaching students while leaking personal information: m-learning and privacy. In *Proceedings of 4th International Conference of Education, Research and Innovations* (pp. 1659-1664). Madrid: IATED.

[18]. Caudill, J. (2007). The growth of m-learning and the growth of mobile computing: Parallel developments. *International Review of Research in Open and Distance Learning*, 8(2), p.1-13

[19]. Wagner, E. (2005). Enabling mobile learning. *EDUCAUSE Review*, 40(3), p. 40–53

[20]. Stanojevic, L., & Rakic, B. (2018). Mobile technology in higher education—a student perspective on learning with mobile computing devices. *Successful Implementation of Information Technology: It, Marketing, Education and Business Working Together for Business Success*. Silver and Smith Publishers, London, 8-27.

[21]. Pillay, F.R., Ramdeyal, P.K. (2012). Student Access to and Use of ICTs and the Implications for Academic Staff: Views from a Developing University of Technology in South Africa. In: *14th Annual Conference on World Wide Web Applications*, Durban.