

THE USE OF MOBILE TECHNOLOGY IN PROFESSIONAL EDUCATION OF STUDENTS

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Abstract

Purpose: The goal of the article is that to demonstrate the results of the research of the level of students, who belong to various higher educational establishments, in preparation for introduction of mobile technology into educational process. Therefore it permits to diagnose the status of the theme.

Design/methodology/approaches: The applied methodology consists of the theoretical analysis of scientific literature on problems of mobile learning of students. The concept «mobile learning» was categorically characterized as a component of more general category – «educational technology». The sociological research among students of higher educational institutions was conducted and recommendations were made.

Findings: During the theoretical analysis and the practical research it has been revealed that students use the mobile device to educational process insufficiently, considering the high level of its technical facilities. Nevertheless, almost all of the students are ready to introduction of mobile learning as the main form of education. The received results show that mobile learning effectively takes root into educational life of students.

Originality / Value: According to the opinion of the authors, the use of smartphones and laptops in the educational process will begin to increase year by year in the nearest future and give to student an opportunity of a choice of technology of education.

Keywords: *information technology, mobile learning, mobile technology, mobile devices, education, blended learning, students.*

INTRODUCTION

Today the system of blended learning widely takes root into the education system of the higher school, which combines different types of teaching that make modern education more effective and interesting. Blended learning combines advantages of various forms of teaching, and best of all it approaches an educational context in the interactive educational environment.

Mobile learning (m – learning – Mobile Learning) – learning implemented using mobile portable devices such as mobile phones, laptops, and tablets. M-learning technology is closely related to e-learning and distance learning technologies, it is expected that in the near future mobile learning will become an integral part of most educational technologies. (Paskova, 2018; Courtney, 2018). This learning is possible to combine with other types of learning, providing interactive conditions of students' preparation. In spite of the widespread of this type of learning it puts a number of questions, which requires the solution, before teachers and students because of the insufficient familiarization in the accepted and approved education system (Abilgazyeva et al, 2018). Under these conditions the main objective of state programs – providing Russian education with high quality according to the changing requirements of the population and perspective objectives of development of the Russian society and economy – is formed.

THEORETICAL FRAMEWORK

The introduction of information technology

The introduction of the information technology into education and its conjunction with classical methods of learning makes students confront the fact that the form of education changes, therefore all of them should be ready to perception of improved elements of content.

The attention of students to studying a subject has decreased, first of all, because of the application of standard and outdated means of learning. It is the use of the same textbooks, tables, and charts. Modern information technologies, namely mobile devices, have been introduced at different stages of educational process to increase interest in the subjects of study and to gain knowledge in the disciplines.

The main cognitive importance of information technologies consists in that they give the various and remarkable saturated environment of learning with endless opportunities, to which either a student or a teacher has access. Computer information technologies in comparison with regular methods of education have a number of advantages. They can be as addition to a possibility of more illustrative representation of material or as an effective examination; also they can be classified as a variety of organizational forms in work of student or methodical acceptances in work of the teacher.

Information technology in comparison with traditional methods of education can give a lot of knowledge to students, but moreover, it can help them to expand their mental and creative abilities and their abilities to obtain new knowledge independently and to work with different sources of information.

According to a way of the use of information technologies, there are several types of classes. The first one is the type when the computer is used in the separate mode – classes in the computer class which has no access to the Internet. The second type is the type when the computer is used in a separate procedure – a lesson in the computer class with Internet connection. And the third type is the type when the computer is used in a visual mode – there is a computer on a table of a teacher and a widescreen to demonstrate some information to students.

The third type of class has become the most suitable one after introduction of information technologies in educational process.

More sophisticated equipment is used during classes in some subjects. Therefore it has become very important to use special computer programs for learning a subject, first of all, because of the possibility of observation of processes and phenomena which cannot be conducted in a classroom or cannot be entirely understood because there is no opportunity to present it graphically.

It is complicated to study production engineering for the students who have visual perception because such students are incapable to understand and to carry out work on the subject without the visual perception of this process in general. There is a variety of computer programs with advertisements and the right to «control» the process by moving graphs and charts for such students. All of that works effectively in combination with classical academic classes. Education through information and communication technologies is not only a transfer of knowledge to student, but also it is a developmental process and creative approach to the point. Such techniques of learning develop independence of students and expand their knowledge and skills which can be applied in practice subsequently.

Nowadays classes cannot be limited only to a training manual on a subject, a blackboard in a classroom and a teacher. It is known that such traditional classes, in comparison with classes with the use of information technologies, cannot give a lot of information to students. Students are not interested in reading literature or visiting library, therefore the implementation of individual work of students does not conform to certain requirements. Today individual work of student is closely related to information and communication technologies, which let student organize their work the way they want, in order to motivate students to gain new knowledge, student has to want to get and learn new information. Students become more motivated to be insisted and interested by dint of information technologies that are used during classes.

Many various programs have been created and published recently: preparing and checking programs, and moreover, a lot of e-books, textbooks, educational and methodical complexes have been created. The teacher gives a new educational material to their students using computer technology and applying the following programs: presentations, e-books, virtual practical works in laboratories, tests, exercises, and many other things. And traditional forms of education in mobile learning change because of these innovations: seminar becomes an electronic forum, communication process turns into an interactive forum or a chat room, multimedia materials begin to be extensively used on lectures, and a practical work becomes an obligatory component of forming of professional competence ([Kuklev, 2009](#)).

Today the use of mobile devices in higher educational institutions is still considered by teachers as help for the teacher during traditional contact classes. According to the opinion of students, mobile technologies are indispensable devices by means of which they can look through their schedule, use e-books and reference books on their classes, and moreover it gives the opportunity to work in text redactors, etc.

The use of computer technologies allows students to choose an interesting type of work by themselves. For example, the students with mathematical skills, as a rule, choose preparation of presentations, and the students, who are inclined to the humanities, prefer reports and essays. Therefore it is possible to draw a conclusion that the use of computer technologies gives great interest to students; amount of useful information, you can learn, increases; classes become more interesting and fascinating; quality of education improves.

Thus, information technologies give a lot of opportunities for us:

- To use the computer for self-education;
- To create an open education system;
- To change the main processes of education of students;
- To rationally arrange cognitive activity for students.

Mobile learning

Mobile learning is closely connected to electronic devices and distance learning, the difference is presented in the form of the use of mobile devices. The educational process takes place freely with the use of portable technologies and does not depend on location. In other words, mobile learning reduces restrictions for education by means of portable devices in the country.

It is almost impossible to imagine our nowadays life without mobile devices, and then mobility will be one of the most important conditions for the educational process in the future. Information technology opens new huge opportunities up in such fields as personal control over health status, active citizenship or learning of foreign languages.

Many different active approaches, such as crowdsourcing, will be extended in the nearest future. Such processes give an opportunity to collect and keep a huge amount of information due to a large number of mobile users. Providing with universal and convenient network connection will facilitate remote control of personnel and allow dividing educational resources. Some teachers of educational institutions do not allow using of mobile phones and other similar devices, but it is doubtful whether such approach will last long. Nevertheless, perhaps there still will be purposeful use of mobile technologies, for example, in order to raise the level of literacy and knowledge of arithmetic, or reaction to other global issues when they occur.

The future of mobile learning includes the development of context-sensitive technology that can use the movement, routes, and preferences of students in order to improve access to the necessary resources where they are most needed.

Mobile learning is not innovation: it has appeared in 1901 when the Linguaphone Group released lessons of a foreign language on wax cylinders. There are five main directions where mobile devices can be used widely: self-education, school and higher education, distance and corporate education.

A mobile training consortium was created in 2002 in Canada. It included several large companies, Seneca College and Northern Alberta Institute of Technology. There is a large community of creators of World Academy Online – Digital and Mobile Learning Community on LinkedIn, where you can find out about an information resource such as My University. It is an extremely useful resource where you can listen to and watch lectures and courses of major universities and business schools on mobile devices ([Kearney, M., & Maher, D. \(2013\)](#)).

Let's consider the types of e-learning used in the educational system of Russian higher schools. According to GOST-R52653-2006, we have (GOST52653-2006, 2007):

- *Electronic distance learning* (it is the education of students with the use of information and communication technologies);
- *Online-learning* (it is the education with the use of information and telecommunication networks);
- *Offline-learning* (it is the education with the use of the computer without having a connection to the information and telecommunication networks);
- *Collaborative learning* (it is the educational process, in which numerous participants cooperate to achieve a common goal);
- *Mobile learning* (it is a variant of e-learning with the use of mobile devices that do not depend on location of student).

Advantages and disadvantages of mobile learning

Advantages of mobile learning

Capacity building and ensuring equal access to education: Prices of mobile phones are going down day by day, more and more people, even in the poorest regions have the opportunity to buy and use these devices. Today there are many projects based on the use of mobile technologies that provide everyone with modern educational materials through mobile communication([Chen, B., & Denoyelles, A. \(2013\)](#)).

Personalization of education. Mobile devices are the property of certain owners, there are many opportunities for settings at their disposal. That is why mobile technologies in comparison with fixed technologies provide greater opportunities for personalization (recommendations 2015).

Instant feedback and evaluation of the results of studies: Mobile technology increases the speed of evaluation of results of studies and gives the opportunity to fast track their achievements to students and teachers.

Anywhere and anytime learning: Today the process of learning can be carried out anytime and anywhere because the most part of the time the mobile device is with its owner. People have not could even dream of it before. Mobile applications for learning give a choice to users: they can do some exercises, which take them several minutes, or they can completely focus on work for several hours. Students can learn something during breaks between classes or during a bus trip due to the flexibility of mobile learning.

Support for situational learning: In comparison with the traditional process of learning in classrooms, the mobile device lets students move to the environment which facilitates the process of understanding a subject as much as possible by using various mobile applications. For example, mobile applications, which perform the function of city guides, contain information about the most important architectural sites, their composition, structure, and value; mobile applications that provide information about plants and many others.

The development of continuing education: You can increase the effectiveness of your studies due to online data storage (cloud storage). Educational resources and other information can be stored in the cloud storage instead of the hard disk of a personal computer; therefore students can work with the same information using different devices. Today, the software allows you to synchronize data between several devices; therefore you can continue to work on your mobile phone at the point where it was stopped on the PC, and vice versa.

Ensuring links between formal and informal education: Mobile devices are blurring the boundaries between formal and informal learning, contributing new knowledge. With the use of mobile devices students can easily find additional resources for better understanding of educational material which has been discussed in the classroom. For example, there are many applications for studying languages, which «speak» with the students and «listen» to them through the phone's built-in speakers and a microphone.

Help for mentally or physically challenged students: Due to the technologies which can change the scale of the text, voice transcription, geolocation and change the text-to-speech, mobile devices greatly improve the quality of education for people with mental and physical challenges ([DiLullo, C., McGee, P., & Kriebel, R. M. \(2011\).](#))

Disadvantages of mobile learning

Cost of technologies: Discounts and subsidies may make mobile learning accessible to many people, but not to everyone who wants. Most people cannot afford to use these technologies for various reasons.

Accessibility: Students, who commit to using the method of mobile learning, think that technology has opened up new possibilities for people with different features. But in some cases, it gives a bad effect. Therefore before using mobile technologies you have to make sure that such type of work will be good for these people, considering their mental and physical health.

Source of power: Educational programs on mobile devices consume battery faster than standard applications. Battery life is one of the most significant drawbacks.

The need to prevent leakage of information and safety of information: The use of any devices requires the formation of moral and safe relations with other users. Unfortunately, a universal method, that would help prevent users from molestation, threats, and theft of personal data has not been invented. There are only strategies how to minimize risk.

Screen: Small touch screens, as a rule, are the standard for smartphones and tablets, and that creates some problems in the process of learning. In some cases, they are inaccurate and cannot accurately respond to the requests of user, while others, on the contrary, are too sensitive to any action ([DiLullo, C., McGee, P., & Kriebel, R. M. \(2011\).](#))

Loss or theft: Mobile devices (usual smartphones) are often lost or stolen because of their compact size. And it is the loss of important information in both cases.

Compatibility: Compatibility or rather incompatibility of mobile devices is another minus, on which programmers scratching their head. There is no universal software for mobile devices, so synchronization of projects seems very complicated.

Lock: A lot of organizations actively block sites such as Facebook, Twitter, and other social networks. In this regard, there is a problem when it comes to the use of their educational potential ([Chen, B., & Denoyelles, A. \(2013\).](#))

And the last point is **outdated models**. Technologies change at a very high speed, and it is often not affordable to keep up with them. Also, new functions and programs appear day by day and it is hard to chase novelties.

Information technologies have many other advantages in the educational process, besides the advantages and disadvantages which have been already mentioned (Table 1):

Table 1: Mobile technologies in the educational process of higher school

Aspect	Advantages
<i>Pedagogic</i>	Personalization and individualization of learning (personalized pedagogy)
<i>Social</i>	1. Possibility of a team approach to the solution of a particular issue; 2. The corporate educational system focused on advisory support to students
<i>Physiological</i>	1. Mentally and physically challenged people have an opportunity to get an education; 2. The educational process does not depend on the location of students.
<i>Technical</i>	1. The student uses their own devices; 2. Instant access to the internet connection; 3. The transfer of information between users by wired / wireless technologies; 4. The use of supporting applications; 5. Information is easier to digest in a multimedia format.

To sum up, mobile learning in the system of high professional education has a high didactic potential. It makes easier for students to learn new material and mobile learning technologies, taking root in the educational process, create a new model of professional education.

METHODOLOGY

The methodology, which the authors have used, is a sociological poll in the form of a survey based on a representative sample. The poll was attended by 1600 students of Tyumen higher education institutions.

RESULTS

In the labor of Karpenko O.M. and other authors, it was determined the number of students with mobile phones at the University for 2012 – 96%, 80% of students have a Smartphone, 60% of students have laptops. The most commonly used mobile phone functions are: information search on the internet and instant messaging; the use of dictionaries and translators, calculator, listening to music and watching movies; more than 70% of the least used functions include reading e-books, writing text in redactors and checking the mailbox – from 20 to 30% ([Karpenko, 2015](#)).

A group of authors (Martínez-Argüelles, M. -J, Plana, D., Hintzmann, C., Batalla-Busquets, J.-M., Badia M.) examined the opinions of students in the semantic aspect of the feedback in a virtual learning environment. They concluded that most of the students recognize the great importance of receiving feedback from their teachers. The process of personal feedback between teacher and student motivate students to communicate with teacher-advisor and facilitate the educational process ([Martínez-Argüelles, 2015](#)).

In the 2017-2018 academic year, sociological research was conducted among students of Tyumen higher education institutions to determine how much students are prepared for introduction of mobile technology in the educational process. The poll was attended by students of technical colleges (73%) and humanitarian colleges (27%). It was revealed that 94.4% of respondents have a Smartphone, and 64% have laptops besides smartphones. Students enjoy a certain operating system, which is used on a particular mobile device; 65,8% of students use Android, 36,5% - IOS; 0,7% – Symbian.

Analyzing the responses of students, it can be claimed that the most widely used mobile phone functions are: searching for information on the Internet 92.4%; social networks (vk, classmates) – 90.2%; Messaging – 86.1%; viewing of photos and videos (YouTube, Instagram) –85,2%; software (applications) – 66.6%; reading books – 25%; other (dictionaries, translators, reading news) of 19.5%.

As we can see, such aspects as reading e-books, dictionaries, translators are used slightly. As a result, the authors believe that students do not use the mobile device sufficiently in the educational process, considering the high level of its technical abilities.

Nevertheless, 88,4% of students of the Tyumen region support the introduction of mobile technologies in the educational process, 8.9% – strongly opposed, 2.7% of students just do not care.

When students were asked what programs would they use for learning on mobile devices, the most part of respondents (45%) would like to view the educational materials (lectures, tutorials, laboratory work to do) by their mobile device, 38% of students would like to receive online tutorials, 32% would like to have access to special programs that were designed and implemented by an educational institution, 22% would like to have access to the information about their progress.

The practice of the use of mobile devices and the survey showed that mobile learning effectively took roots in the educational life of students. Almost all students are ready for the introduction of mobile learning as a basic form of education. According to the opinion of the authors, the use of smartphones, laptops for educational purposes will become more popular and will provide students with a choice of learning technologies ([Bahremand, 2015](#); [Suleri & Cavagnaro, 2016](#); [Mambile & Machuve, 2018](#)).

Considering all the information, the authors offer the following recommendations:

1. To create an application for the control over the educational process on the basis of a higher educational institution in order to give students more mobile access to information sources at any time and in any place;
2. To create a channel on the video-sharing website «YouTube» to download video lectures;
3. To ensure information and methodological support for practical lessons;
4. To organize online consultations on different subjects on certain days and hours.

CONCLUSIONS

The following results were obtained during theoretical analysis and practical research. Students, using mobile technology, can:

- a) Freely move during the educational process;

- b) Thanks to mobile technologies, students have the opportunity to adjust the content of educational content, they can ask questions and conduct research, and not just listen to lectures;
- c) Learners can learn at their own pace using multimedia content on their mobile devices;
- d) Open the scopes of the educational process outside the educational institution;
- e) Reduce material costs because it does not require to buy a personal computer and traditional textbooks;
- f) Easy to share educational material with each other by modern wireless technologies (GPRS, Bluetooth, Wi-Fi);
- g) To receive information in a multimedia format, which promotes better digestion and memorization of the material, increasing interest in the educational process.

To sum up, the expediency of the introduction and use of modern technology in the educational process becomes obvious. In the future, teachers can plan the work and students can study any subject outside the walls of the educational institution. Mobile and wireless technologies will be a part of daily learning, both inside and outside the classrooms in the near future (Golitsyna, 2011; Razavi et al, 2015).

Most students and teachers are ready for blended learning because it is very important to combine several types of activities today. Another major advantage of education with using portable mobile technology is an opportunity not only to bring education to the masses, but also to improve the quality and accelerate the process of acquiring knowledge, but also to make education more affordable in the material aspect, that much important nowadays.

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