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## Mobile learning in the system of new pedagogical technologies

The concept of mobile learning is based on intensive deployment of modern mobile equipment and technologies. The article is to analyze the content of the concept of mobile education features and outline its effective usage in the new educational technologies. Determined three of the four directions of the definition of mobile learning. To determine the priority of each of these areas the place among mobile learning technologies is pointed out.

Considered and analyzed major modern technologies of automated education: distance, electronic and mobile and presented a correlation between them. The possibilities of basic components and principles of mobile learning are underlined. The possibilities of distance learning, which are based on mobile communications, computer and network technologies are analyzed. Investigating mobile learning, mobility and functionality are selected as criteria for technology education division. Its underlined that the main purpose of mobile learning is to improve human knowledge in a particular area if it is necessary. This is a general trend of intensification of life in the informational society. The main challenges have been chosen in the direction of research that are in development methodical bases of effective usage of mobile learning in the system of new educational technologies, introduction of new courses, development of teaching materials and improvement of educational training programs.

***Key words***: mobile learning, distance learning, electronic learning, pedagogical technologies, automated education technologies, informational-communication technologies.

The rapid development of information and communication technologies facilitates the introduction of many new opportunities for education management. Today the full idea of learning can be done at any time and in any place. Active usage of mobile phones and various electronic devices in public life is a feature of the last decade. Modern mobile phone functionality is not inferior to the computer. Prevalence among users of mobile smart phones and personal communicators has a clear upward trend. Providing education institutions modern means of information and communication technologies and their association by means of the Internet creates conditions for distance education.

**Formulation of the problem.** Almost the entire problem is not elaborated mobile learning combined with high interest in it from both the teaching staff and of the students. An important challenge facing modern pedagogical science is teaching and training the younger generation that is able to actively engage in a new stage in the development of modern society, related to computerization [1]. The ability to study wherever and whenever inherent in mobile learning, contributes to solving this problem. This new concept is based on intensive usage of modern mobile equipment and technology. *The aim of the article* is to analyze the content of the concept of mobile learning features and outline its effective usage in the new pedagogical technologies.

**Analysis of studies and publications.** *Mobile learning* (mobile learning, M-Learning) can be seen as the modern direction of development of distance learning using mobile phones, smartphones, electronic books [2].

Technology of mobile learning foresees existence of system for distance learning. Compared to traditional mobile learning is possible to monitor in real-time learning that can be considered not only as a teaching tool, but also as a tool for collaboration, intended to improve the quality of education. The proposed definition of mobile learning is not the only approach to classification. We can distinguish at least another three:

- in relation to the formal (organized special) education. In the literature on mobile learning formal education is often characterized as learning „face to face", but as one of the forms of distance education (i.e., distance course) have existed for over 100 years, which raises a question about the place of mobile learning in relation to all traditional forms of learning (as traditional learning we understand organized and by the teacher managed or guided learning „face to face" in the group at a certain time and a certain place);

- in relation to the subject of learning. This trend is evident in the study of the concept of mobile learning M. Sharpless, John. Taylor, C. O'Malli and their colleagues. In early works of the team, led by M. Sharpless, the concept of mobile learning was closely associated with the device and supportive opportunities for lifelong learning [10]. However, over time the attention of the device was transferred to the student. This led to the consideration of mobile learning of the student and defining it as „any kind of learning that takes place when the student has no fixed, predefined location or education when the student

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uses the learning opportunities offered by mobile technologies" [4, 8]. In the last works of the team the theory of contextual aspect of mobile learning was under development;

• in relation to electronic learning (e - learning). This approach characterizes mobile learning e-learning extension (by such a means, T. Georgiev presents it as „a new stage of development of e-learning" [6, 1]), but the totality of this definition does not help to determine the characteristics of mobile learning. J. Traksler generally states that in definitions of e-learning they are just looking for a place of „mobile learning about a range of e-learning portability" [4, 7].

Thus, in this sense, mobile learning is covering at least three of the four directions of the definition of mobile learning. To determine the weight of each of these areas, let us consider place of mobile learning among other technologies.

**Main content presentation.** Let us review the basic modern technologies of automated learning:

*1. Technology of distance learning.* Distance learning has arisen due to the need for continuous lifelong learning and development opportunities through specific cognitive abilities important in its usage.

Distance learning is not a new form of education: its history goes back more than 150 years of deployment and traditions. Its main feature is the spatial and temporal distance between teacher and student.

Distance learning should not be confused with distance course, where students receive an educational plan and course programs, a number of „face to face" classroom hours, then individually are preparing and are certified. The basic idea of distance learning – „give" knowledge to the student, who is usually far from their storage sources. In the past, when there was no current means of electronic communication, there were used printed materials sent by post, and there was feedback through correspondence (correspondent education).

There is no questions about the benefits of distance learning for society: it frees application activity students so they can study at any time, in any place and in a manner consistent with their employment. Despite these advantages, the first 100 years of distance education have been noted by critics. In the 1970s in Europe there were established open universities (including the Open University of the United Kingdom in Milton Keynes, [8] and the National University of Distance Learning in Madrid), which changed the status of distance learning, making it an internationally recognized university education.

By D. Kigan, distance education has five main forms of its implementation [7]:

1) distance learning – providing education and distance learning through open universities, distance learning institutions and distance education departments of traditional institutions;

2) electronic learning – online Internet learning using LMS;

3) synchronous electronic learning – electronic learning with active feedback;

4) Online lectures – spread video lectures by means of intranet, social networks and WWW;

5) mobile learning – learning through handheld computers, smartphones and mobile phones.

*2. Technology of electronic learning.* In the broadest sense electronic learning training can be viewed as exercised and maintained by electronic means and electronic media. These electronic means may be specialized or universal, such as a computer that belongs to a class of complex electronic devices. Thus, any computer training can be attributed to electronic learning.

In the interpretation proposed by the European Commission under the eLearning they understand the process of building knowledge and skills through or completely through the Internet [5].

According to the interpretation of the European Commission, e-learning can be seen as a form of distance learning. From this perspective, it is distance learning, implemented in the Internet environment to the method of transmission of educational materials electronically. This interpretation includes online learning, Web-oriented learning, virtual classrooms and universities, „digital" cooperation and technological support for distance learning.

However, these components E. M. Smirnov-Trybulska [3] includes to the modern interpretation of distance learning, so in Ukraine is a more common interpretation, electronic learning (e-learning) – a presentation of training materials and learning management using new information and communication technologies. We follow the interpretation of e-learning as learning that is supported and stimulated by the use of ICT.

Elements of electronic learning system common with distance learning are:

• content objects: learning material divided into modules that contain objects of different nature – text, graphics, images, audio, animation, video etc. Typically, they are stored in a database and are available depending on the needs of education. The result is the individualization of learning – students receive only what they need, acquiring knowledge in a desired pace;

- community: students can create online communities for mutual support and messaging;
- expert online support: teachers-experts are present online for consultation, answering the question and initiating discussions;
- possibilities for cooperation: using the appropriate software online conferences can organized, as well as common work on a project of students that are geographically distant from each other;
- multimedia: modern audio and video technologies for presentation of educational materials to stimulate the desire of students for acquiring knowledge and increasing learning efficiency.

The main advantages of electronic learning:
- individualization of learning: learning tools enable students based on their capabilities, to choose the type, tempo and method of getting the materials based on their own preferences;
- decreasing the cost of education: non-formal education system can significantly reduce or even eliminate the cost of education for students - in all other cases the value of e-learning is equal or even higher than traditional full-time study;
- fast and easy access to the training materials, users can access the educational content from any location where an Internet connection is available;
- the possibility of joint training through the exchange and sharing of educational content between linked users;
- reporting: learning, knowledge testing, evaluation and monitoring of the educational process, credit accumulation and passing of educational programs and plans and obtaining a certificate of learning outcomes automated. This saves the different data that can be used for administrative control of the learning process and the formation of various reports.

*3. Technology of mobile learning.* The literature offers various interpretations of mobile learning, which has a common fact that this technology teaching has a physical connection to the cable network is an optional fact [9]. From this perspective, mobile learning can be defined as an approach to learning, where based on mobile electronic devices a mobile learning environment has being created where students can use them as a means of access to educational materials that are on the Internet, anywhere, any when.

Mobile learning is, on the one hand, a kind of distance learning, on the other – electronic learning (*Fig. 1*). Compared with an electronic and distance learning mobile learning provides the subject of learning more „stages of freedom" – higher interactivity, more movement freedom, more technical means, the main ones being UMPC – ultramobile-PC (Intel Classmate, Asus EEE, XO-1 ), Tablet PC - Tablet PC ultraportable laptops, PDA (personal digital assistant), audio recording and listening to lectures, multimedia museums guides, multimedia game consoles, e-books, mobile phones, smart phones and many other [6].
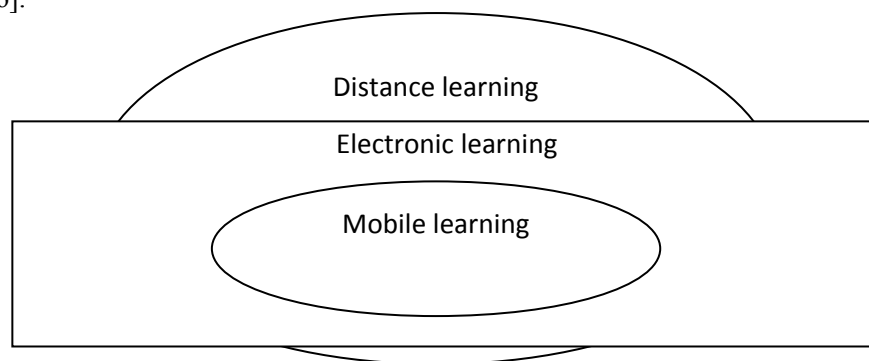


**Fig. 1.** *Correlation of e-learning, distance learning, mobile learning*

D. Keegan, identifying mobile learning, underlines mobility and functionality as the criteria for separation of technology training:

|  *functionality* | | |  *mobility* | |
|---|---|---|---|---|
| *personal computers* | *laptops, tablets* | *personal digital assistant* | *smartphones* | *mobile phones* |
|  *electronic learning* | | |  *mobile learning* | |

To the special features of mobile learning M. Sharpless includes: shared online work on project, moblogging (mobile blogging) personalized teaching, work in groups, online research, equal access to education [10].

J. Traxler identifies several areas of implementation of mobile learning [11]:

- technology-oriented mobile learning – some specific technological innovations introduced into educational process to demonstrate the technical advantages and pedagogical opportunities;
- mini e-learning – mobile, wireless and portable technologies used for re-implementation of solutions and approaches already used in „normal" e-learning tools, there might be a transfer of some technologies of e-learning such as virtual learning environments (VLE), to mobile platform, or usage of mobile technologies as a flexible replacement of static desktop technologies;
- a combination of mobile learning and learning in the classroom – the same technologies used to support collaborative learning in the classroom, possibly in combination with other technologies such as sensor boards;
- informal, personalized, situational mobile learning – the same technologies with additional functionality, for example, depending on the location;
- mobile training – technologies used to improve the productivity and efficiency of mobile workers by providing materials and support „just in time" in the context of their priorities;
- remote (rural) developmental mobile learning – technologies used to address environmental and infrastructure issues and support education where „normal" electronic learning technologies do not work.

Mobile distance learning can be realized by any of these areas depending on the infrastructure (energy, postal services, Internet, etc.), thinness communication space (rare personal contacts, lack of technical support, etc.), development of distance learning etc.

Sometimes separately is allocated virtual learning, which is defined as all forms and approaches to learning using the Internet. This e-learning, by definition of the European Commission, or combination of mobile and e-learning in our definition.

The main purpose of mobile learning is to improve human knowledge in the field where is wished and at the time when it is needed.

Thanks to modern technologies of mobile communication (interaction „student-teacher" conducted in high-speed messaging environment) through mobile training a high degree of interactivity, which is crucial for learning is provided.

Mobile learning offers new means of distance learning based on mobile communications, computer and network technologies. This is achieved through the usage of mobile and portable devices such as PDAs, smart phones, laptops and electronic notebooks. There should be as well possibility to connect a computer to other devices and the Internet for providing training materials and conduction exchange of messages between participants of the educational process (students, teachers, mobile services providers and Internet providers).

As one of the main prerequisites for the development of mobile learning should indicate exponential growth of mobile communications and technologies:

- each quarter the amount of companies developing software for mobile devices, increase by 1000;
- the number of mobile subscribers in Ukraine exceeded the size of its population;
- sales of multifunctional mobile devices exceed the number of personal computers sold.

Along with the development of mobile communications and the need to obtain various knowledge, the great mobility of the population is growing rapidly (over 50% of employees of companies spend 50% of their time outside the office).

**Conclusions.** Mobile learning – new learning technology based on intensive usage of modern mobile equipment and technologies. It is closely connected to educational mobility in the sense that students should be able to participate in educational activities without restrictions in time and space. Usage of mobile technologies opens new opportunities for learning, especially for those living in remote or isolated places or faces learning difficulties. The ability to study wherever and whenever inherent in mobile learning, now is a general trend of intensification of life in the informational society. *Prospects for further investigations in the area of research* are to be found in the development of methodological principles of effective usage of mobile learning in the system of new educational technologies, introduction of new courses, development of teaching materials and improvement of educational training programs.

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***Шевчук Світлана. Мобільне навчання в системі нових педагогічних технологій.*** У статті проаналізовано зміст поняття мобільного навчання та розглянуто особливості його ефективного використання в системі нових педагогічних технологій. Окреслено можливості основних компонентів та принципів мобільного навчання. Запропоновано структуру співвідношення електронного, дистанційного та мобільного навчання.

***Ключові слова:*** мобільне навчання, дистанційне навчання, електронне навчання, педагогічні технології, технології автоматизованого навчання, інформаційно-комунікаційні технології.

***Шевчук Светлана. Мобильное обучения в системе новых педагогических технологий.*** В статье проанализировано содержание понятия мобильного обучения и рассмотрены особенности его эффективного использования в системе новых педагогических технологий. Определены возможности основных компонентов и принципов мобильного обучения. Предложена структура соотношения электронного, дистанционного и мобильного обучения.

***Ключевые слова:*** мобильное обучение, дистанционное обучение, электронное обучение, педагогические технологии, технологии автоматизированного обучения, информационно-коммуникационные технологии.