MOBILE TECHNOLOGIES WITHIN CONTEXTUAL LEARNING

Vera I. Toktarova

Assoc. Prof., PhD, Mari State University, Russia, toktarova@yandex.ru

Abstract

The article studies an acute issue of rampant development of mobile learning irrespective of time and place. Nowadays mobile learning gives a new quality to the educational process, reflects trends in the education of modern people to the fullest extent possible, providing constant access to information. It is a new tool in the formation of information society. The article deals with the issues of using mobile technologies in the process of contextual learning. The subject matter of the research is the description of basic characteristics of training within the context contributing to the development of professional competences of students. A model of contextual learning using mobile technologies in the university e-learning environment is offered. The description of the mobile learning system for developing Java web-applications is given.

Keywords: professional competence, contextual learning, e-learning, electronic educational environment, mobile learning, e-learning systems, programming, educational process, university.

MAIN TEXT

At the present time socio-economic conditions and innovative character of the development of education make new demands to the professional development of HEIs graduates having high qualification and information culture. Professional competence of students has a special place in this process as an important component of success of their future professional activity.

In different sources *professional competence* is understood as:

– an integral characteristic of business and personal qualities of specialists reflecting the level of expertise, knowledge, skills, and experience enough to implement a special type of activity connected with making decisions (Simonenko and Retivykh, 2003);

– worker's ability to implement his/her functions in a good and accurate manner both in normal and emergency conditions, capture new information with success and quickly adapt to the changing conditions (Vesnin, 1998);

– a characteristic of quality of specialist training, labor activity efficiency potential (Pugachev, 2000);

– an ability to act successfully on the basis of best practices, skills and knowledge when solving professional tasks (Blinov et al., 2010).

Professional competences are formed during the process of activity, and their quality and level are determined by the degree of involvement into this activity. At the same time the process of professional competences development shall be flexible, shall be improved at regular intervals depending on external and internal conditions of educational practices, which will allow forming student's abilities to self-development, self-education, creativity, as well as increase a level of graduate's competitiveness at the labor market. There is a big number of profession-oriented learning technologies directed to the development of student's professional competence, one of which being contextual learning.

Contextual learning is learning which allows modelling dynamically subject and social content of professional activity providing conditions for transformation of student's classical learning activity into professional specialist's activity (Daldaeva, 2013). The theory of contextual learning founded by A.A. Verbitsky is based on an activity theory of acquiring social experience as a result of active efforts of an individual (L.S. Vygotsky, A.N. Leontyev, S.L. Rubinshtein et al.). The corresponding methods are widely developed both in Russian and foreign practices. They include brainstorming, analysis and synthesis, discovery and problem-based learning, discussions, role play, team learning, etc. According to the works of A.A. Verbitsky (1991), the organization of contextual learning implicates phased transition of students to the activity of higher level: from lectures and seminars (academic learning activity) to business and didactic games (quasiprofessional activity), then to practices and probations (educational and professional activity). In addition, it is important to note the necessity of complex approach to the use of different methods, means and forms of active learning, naturally combining them with traditional methods. The principle "learning by doing"(DuFour Ri et al., 2010) is the basic one in contextual approach.

As a result of analysis of scientific sources the following basic characteristics of contextual learning were found out:

– modelling in the language of sign means of subject and social content of future professional activity;

– combination of traditional and new learning forms and methods;

– recreation of real professional situations and fragments of productions, relations of people involved;

– the unit of work of a teacher and a student is situation.

Increasingly stringent requirements for HEIs graduates require new approaches to the arrangement of the content of educational process. The application of contextual learning promotes formation of a specialized educational environment directed to the development of students' professional competence and allowing the teacher to arrange pedagogical cooperation in the frames of academic discipline. In the context of e-learning, according to the provisions of acting Federal Law On education in the Russian Federation, great attention is paid to functioning of electronic educational environment (EEE) which includes complex of electronic educational resources, information and telecommunication technologies and means. EEE providing conditions for implementation of educational activity in conditions of contextual learning allows carrying out:

– nonlinearity of educational process promoting personification of learning activity and implementation of split-level learning; adaptability of the environment to students depending on their personal characteristics and abilities;

– access to profession-oriented and tools environments and services supposing modelling and simulation of future professional activity;

– provision of competence-based sources of professional disciplines having intersubject commonality;

– provision of access to educational resources and applications in EEE from any mobile device.

Mobile learning (m-learning) is considered as e-learning using mobile devices (smartphones, tablets, netbooks, communicators, etc.) not limited by student's location. The acute character of m-learning development is determined by many factors: formation of new society demands in relation to technologies of modern education, development of market economy, perfection of teaching forms and methods. Mobile learning devices promoted the development of the concept named BYOD (Bring Your Own Device), main advantages of which are:

– provision of immediate access to the educational resources and web-services independent from the time and the location of the student and the teacher;

– possibility to store personal data and necessary learning materials in mobile devices, immediate Internet connection from the mobile phone;

– increase of efficiency in using IT-resources by means of cost reduction for provision of device mobility and one-user orientation.

The model of contextual learning in EEE conditions together with using mobile technology devices is presented in Figure 1. Main characteristics of such learning are its innovative character and practical orientation, availability and convenience, expansive and massive character. At the same time students could get personalized learning and free training independent from the time and his/her location, rating control and knowledge evaluation.

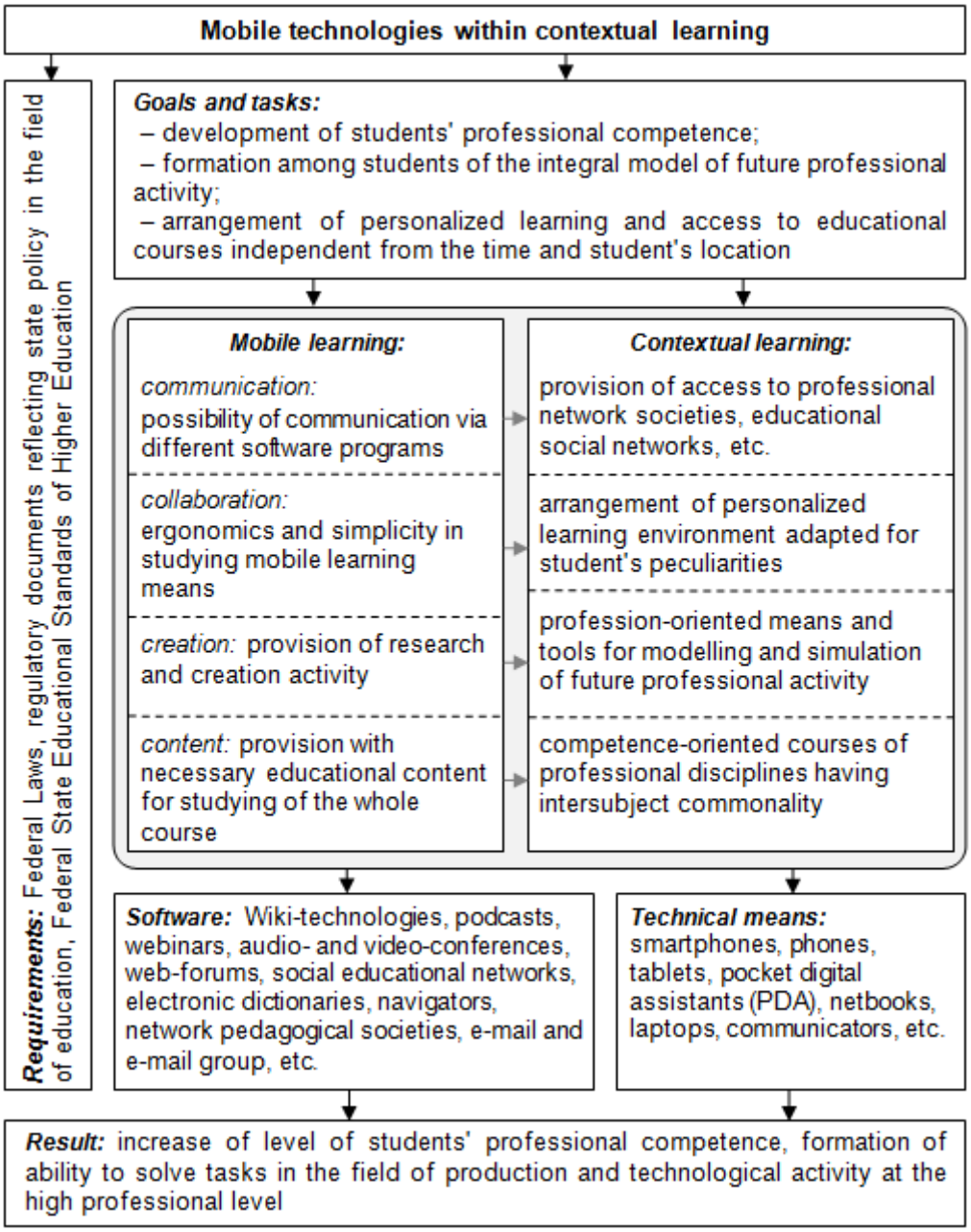

Fig.1. Model of implementation of contextual learning in EEE conditions

The increase of BYOD devices in number supposes the use of qualitative service applications which will be comfortable for work and have functions and productivity similar to those in applications used in office desktop computer. This causes the creation of new requirements to design and development of e-learning systems for mobile applications programming, their efficient introduction into HEI educational process (Toktarova et al., 2015).

In conditions of EEE of Applied Mathematics and Informatics Department mobile educational system "Java Web-applications" was developed and introduced into the educational process; main assignment of the system is to form knowledge and skills of professional level necessary for future programmer to execute successful design and development of Web-applications.

According to Federal State Educational Standards of Higher Education for major “Applied Mathematics and Informatics” objects of professional activity are means, technologies, resources and services of electronic and mobile learning; for major “Fundamental Informatics and Information Technology” the sphere of professional activity of Bachelors includes human-computer interaction, teaching systems and e-learning.

To provide formation and development of professional competence of students-programmers mobile educational system includes the following modules:

– *theoretical*, including learning material structured taking into account learning goals together with professional tasks of future programmer's activity;

– *practical*: laboratory course allowing to acquire programming knowledge and skills in solving professionally important tasks, to develop students' algorithmic thinking; computer simulator supposing work simulation in tool environment for web applications elaboration providing deeper individual learning;

– *control and evaluation* intended for objective evaluation of knowledge and skills quality on the basis of algorithm of automated processing of the results, monitoring and analysis;

– *methodical*: computer reference book intended for storage and presentation to the students information of learning and research character, as well as methodical recommendations and instructions on the work with mobile system and educational material.

As means of development of mobile learning system Java client-server technologies were used allowing to implement versions for computers and different mobile devices, access to web-services of arranging communications (forums, chats, blogs), conducting webinars, audio- and video-conferences, interaction in social educational networks and societies.

The experience of the use of mobile educational system "Java Web-applications" allows drawing a conclusion on the efficiency of the implementation in conditions of contextual learning: enabling student's phased transition from academic learning activity to quasiprofessional and educational and professional activity, and as a consequence formation of student's ability to solve tasks of production and technological activity at high professional level.

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