The Use of Mobile Technologies in the Educational Process

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Abstract. Improving the learning process using information technologies is becoming increasingly popular. The fast development of mobile technologies ensures their further involvement in the educational process. Many educational institutions in the world and in Latvia use mobile technologies to play educational multimedia web resources, to provide quick access to educational sites, and to organize communication between lecturers and students. This paper provides insights on problems and prospects of m-learning, benefits and practical application of mobile education, and also the paper shows the results of a student survey, which assesses whether students are technically and psychologically ready for the use of mobile technologies in education.

Keywords: Educational Process, Mobile Technologies.

1 Introduction

Due to the rapid development of scientific and technical progress, nowadays the amount of knowledge and skills necessary for specialists is constantly increasing, thus increasing demands for the quality of their preparation are set. Computer-aided learning issues are of interest to many scholars: pedagogues and IT specialists. The competitiveness of specialists in an economy market largely depends on the quality of their knowledge. The introduction of information technology in almost all areas of human activity set new requirements for the acquisition of modern knowledge and skills for professionals of various profiles. At the moment, computers have become a necessary tool not only for science and professional activities, but are increasingly being used for education and/ or improvement of professional skills. In higher education institutions, various computerized systems and programs for the organization of students' training and knowledge testing are used in the study process: computerized learning systems (e.g. Atutor, Claroline, Moodle); computerized knowledge testing systems (e.g. Automated Task Control System, WebTest); modelling systems [1]; educational games [2].

Mobile learning (m-learning) plays an important role in the education and professional training of specialists. The rapid development of mobile technologies ensures their further integration in the learning process in order to improve the quality of edu-

cation. Several educational institutions in the world and in Latvia are already using mobile technologies to play multimedia learning web resources (audio and video files, maps, images) and provide quick access to learning sites, resources and dictionaries.

2 Problems and prospects of M-learning

M-learning gives the ability to reliably access information, which was previously impossible. This advantage of access is not limited by time and place. The devices necessary for mobile connection are relatively inexpensive compared to desktop computers or laptops [3], which leads to lower education costs, and makes it available to people who otherwise could not afford it. The European Commission finances large multinational m-learning projects [4]. Companies that specialize in three main areas of mobile learning were formed: Development and publication; Delivery and tracking; Content development. Many conferences and exhibitions about mobile learning were held, including a series of international conferences: mLearn [5], WMUTE [6] and IADIS Mobile [7], ICML in Jordan, mobile training in Malaysia, learning with portable devices in London, Mobile in the USA. Also many projects are devoted to the practice and theory of teaching using mobile devices: mobile learning system The Mobile Learning Network Project (MoLeNET) (Great Britain), Mobile Learning Environment Project (The MoLE) (USA), Mobile Technologies in Lifelong Learning: best practices (MOTILL) (EU), MLearning Consortium (Canada) [8].

Mobile training comes with its own set of problems. Technical problems: connection access; short battery life of mobile devices; the size of the screen and keyboard; information throughput; the number of file formats supported by a particular device; content protection; several standards and operating systems; conversion of existing education training materials for mobile platforms. Social and educational problems: availability and cost of mobile devices for end users; content security or piracy issues; frequent changes in device models, technologies and functionality; development of an appropriate learning theory for mobile age; conceptual differences between e-learning and m-learning; designing technology to support lifelong learning.

3 Benefits and application of mobile education

In this section, the benefits and practical application of mobile education will be discussed.

3.1 Expanding opportunities and ensuring equal access to education

Nowadays, mobile technologies are universally used even where there are not enough schools, books and computers. The prices for mobile phones are constantly decreasing, so an increasing number of people, even in the poorest regions, have the opportunity to purchase such devices and know how to use them. A growing number of projects indicate that mobile technology is an excellent learning tool for students who

are deprived of the opportunity to receive quality education. Thus, the BridgeIT project for Latin America and Asia, which is based on the research approach to learning, provides modern teaching materials. The project is aimed at geographically isolated educational institutions and is implemented through mobile communication. With its help, even educational institutions that are not connected to a fixed telephone network receive Internet access [9].

3.2 Learning personalization

Mobile devices usually are a property of their owners, are at their disposal throughout the day and have many customization features. That is why mobile technologies provide more opportunities for personalization comparing with stationary and information exchange technologies. Depending on the skills and knowledge of the user, applications for mobile phones and tablets allow to choose texts that are more difficult or easier to read. This approach allows to eliminate the constraints faced by students with a higher or, conversely, lower level of knowledge compared to the rest of the class. Although these capabilities were implemented on personal computers several years ago, their use had serious limitations. Students did not have the opportunity to freely bring a personal computer to the classroom or take it home, many could not even afford to buy such a device, so this technology, even if available in computer centers and specialized laboratories, did not become truly personalized. Due to its exceptional portability and relative cheapness, mobile technologies have greatly expanded the potential and opportunities for personalized learning [10]. With the help of mobile devices education becomes informal, personalized and situated [9].

3.3 Instant feedback and evaluation of learning results

Mobile technology accelerates the process of evaluating learning results and gives students and teachers the opportunity to track progress quickly. Previously, students had to wait days or even weeks for recommendations based on their knowledge. Now, thanks to interactive functions of mobile devices, the answer can be obtained almost instantly. This allows students to quickly identify problems in learning process and repeat the key concepts. The use of mobile technologies increases the efficiency of teachers work - through automation of the processes of distribution, collection, analysis and documentation of the evaluation data. So, there are mobile applications, which allow teachers to quickly assess the knowledge of students, checking their fulfilled tasks for reading texts. Usually, these applications work with different operating systems, so that the student can answer control questions from his mobile device, rather than from the device provided by the educational institution. Evaluation of control works is done instantly and, if necessary, reflected in a journal, diary or record-book. So paper diaries or painstaking data input by hand gradually fade into the past [9].

3.4 Learning at anytime and anywhere

Since most of the time the mobile device is close to its owner, it allows to conduct the learning process at any time and in any place. Mobile learning applications give the user a choice: user can perform an exercise that requires several minutes, or completely concentrate on the task for several hours. As an example, there is the UNESCO project, which was implemented to increase literacy using mobile technologies. The usual full-time learning course, which was attended by 250 teenage girls from remote areas of Pakistan, was supplemented by the capabilities of mobile technologies. The problem of literacy is quite acute in Pakistan, especially among women and girls. The level of literacy of men is 69%, while literate women in the country - only 40%. UNESCO specialists decided to provide the girls with remote support after the completion of the course. The only way to communicate with students from villages where there were no computers or reliable fixed communications were mobile phones. Teachers sent text messages to students, reminding them that they need to perform a written assignment or to read the text from the textbook again. Until mobile phones were used in the UNESCO project, only 28% of the girls who received literacy received an excellent mark on the exam. The use of mobile communication increased the number of students who received the highest mark, more than 60% [9]. M-learning can deliver information from anywhere in the world for the student. It can be supplied anywhere in the world ensuring that students are satisfied in their learning, and that any problems arising from their study can be dealt effectively [10].

4 Survey on the usage of mobile technologies in the learning process

Among Riga Technical University first year students in the Faculty of Computer Science and Information Technology which includes four study programs Computer Systems, Automation and Computer Engineering, Information Technology and Intelligent robotic systems a survey was conducted, which purpose was to determine whether it is appropriate to use mobile technology in the learning process. The survey was conducted in 2018 and 161 students took part in it.

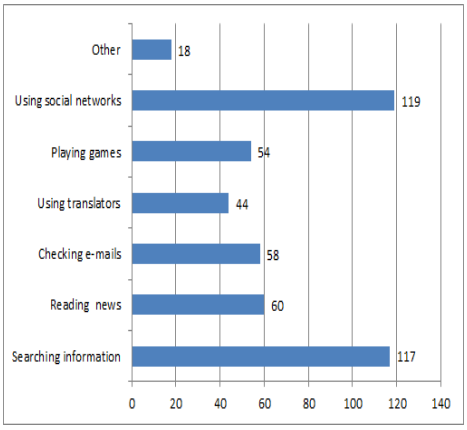

Fig. 1. Most used mobile device features

Quantitative results revealed that 96% of student participants reported using their mobile devices for academic purposes. 97% of students reported using mobile devices more than 90 minutes per day. Mobile device features used by students are represented in Fig. 1.

Survey results revealed that majority of students evaluate higher mobile learning benefits such as "Free access to educational materials", "Ability to interact with other students" and "Portability".

64% student participants agreed with the statement that having course materials (e.g. slides, lecture notes, tests) available on the mobile device would be beneficial to study process (see Fig. 2).

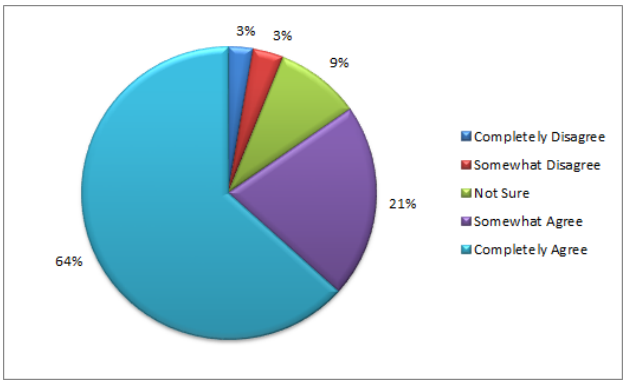

Fig. 2. Course materials availability on mobile devices is beneficial to study process

40% of student participants agreed with the statement that the use of mobile learning technologies would improve overall accomplishments in study courses and another 41% stated that it will "probably" improve (see Fig. 3).

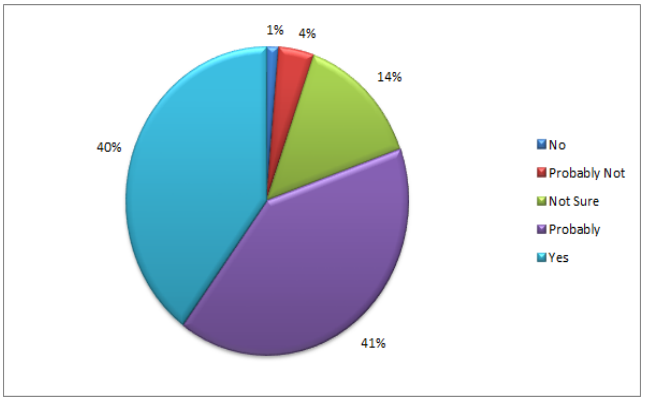

Fig. 3. Mobile learning technologies improve overall accomplishments in study course

5 Conclusions

In the future, teachers and students will no longer need to be limited to the ability to teach and to learn at a particular place and time. Mobile devices and wireless technologies will become an everyday part of learning, both inside and outside the classroom. Most students are technically and psychologically ready for the use of mobile technologies in education, and new opportunities should be considered for more effective use of the potential of mobile learning. The solution of this task requires organizational efforts on the part of the heads of education, research and methodological work of scientists and teachers on the introduction of strategies, forms and methods of mobile learning in the educational process of higher education institutions.

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