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N. Kerimbaev[1], I. Garvanov[2], *G. Tkach[3]
[1,3]Al-Farabi Kazakh National University,
Republic of Kazakhstan, Almaty;
[2]University of Library Studies and Information Technologies,
Bulgaria, Sofia

ROLE OF MOBILE APPLICATIONS IN THE FORMATION OF INFORMATION COMPETENCE OF STUDENTS

This article deals with the topical issue for modern education about the role of mobile technologies in the formation of students' information competence. The aim of the article is to consider the main trends in the formation of students' information competence using mobile technologies in the learning process. The authors of the article give the concept of mobile learning, analyze its advantages and disadvantages. In this paper, mobile applications are considered as a tool for shaping information competence of students. Developed in the study mobile application «TopTaskerGeo» confirms the relevance of introducing mobile technologies in the learning process in order to informatize the educational environment and determines the effectiveness of mobile learning methods in the formation of informational competence of students. According to the survey conducted by the authors, there is an increase in students' interest in mobile learning and information competence. Despite the fact that there is a small proportion of surveyed students who do not accept innovations and prefer traditional teaching methods, lessons using the mobile application «TopTaskerGeo» are interactive and contribute to the rapid development of information and communication skills. The value of this study is the development and implementation of the mobile application «TopTaskerGeo» in the education system in the study of academic disciplines.

Keywords: mobile technology, information competence, learning process, distance learning, education.

Introduction

The global pandemic COVID-19 has brought changes in all spheres of human activity, including education. The transition of educational institutions to a distance

format of classes requires a revision of traditional forms and methods of teaching, and as a consequence, the emergence of new technologies in education. One of the promising areas of research in modern pedagogy is the use of mobile technologies. Currently, the issues of formation of students' information competence come to the fore in the context of the use of Internet technologies. It is necessary to use information and competence technologies (ICTs) to meet the educational needs of modern society and its sustainable socio-economic development. Information competence is one of the priorities of learning. The possibility of its formation is directly related to the active interaction of students with information technology [1–3]. The use of mobile applications to form information competence of students is dictated by the current stage of development of the education system and the level of information technology development.

Analysis of the results of research on mobile learning technologies has shown the versatility of the concept of «mobile learning», the positive and problematic aspects of this direction in pedagogy [4–6]. A team of scientists from the UK believe that mobile devices are effective learning tools, as evidenced by the results of their research. After analyzing the data collected during the scientific experiment, the authors conclude that, given the potential of smartphones in attracting young people to learning, educational institutions should pay due attention to training higher education teachers to use them to form the information competence of students [7]. A study by Taiwanese scholar Jung-Wen Hsia showed that mobile learning characteristics such as utility, ease of use, and perceived behavioral control can provide more cognitive engagement than just using any of them in isolation. Thus, these findings add value to recent research on the use of mobile learning [8]. The results of the Australian scientists' research: Kearney M., Burke P. F. and Schuck S. have provided a model that has emerged from the analysis with respect to each of the primary and secondary dimensions of pedagogical practice of mobile learning applications. This research confirms the relevance of the application of mobile technologies in the development of students' information competence [9]. It should be noted that the process of implementing mobile learning must be consistent with the current stage of development of the economy and society as a whole. It is also necessary to take into account the fact that the introduction of technology is not possible without a clearly developed methodology. The analysis of the application of mobile learning technology in different countries showed that at present the methodology of mobile learning is in the process of formation. At the moment there are a number of problems, one of them was considered by Jordanian scientists: Al-Hamad N. Q., Al-Hamad A. Q., Al-Omari F. A. The article on this study states, «In light of the findings, it is clear that there is still a lack of a culture of understanding among educators about the

importance of using mobile technology in education. Doubts mostly arise from either a lack of necessary skills or reluctance, as well as misuse and distraction in the classroom» [10]. Despite the difficulties encountered, there is a general dynamic of growth in the popularity of mobile learning technology.

Material and methods

The use of distance learning elements in teaching subjects in higher education allows the teacher to expand the ICT communicative sphere, develop students' independent work and self-education skills, and form unified information and competence skills. The use of ICTs at the stage of independent work can take various forms, from searching for electronic textbooks to remote coursework assignments before creating their own projects. Thus, by systematically introducing various ICTs into the teaching of disciplines, we can achieve high results in the study of disciplines by students.

As a tool for mobile learning it was decided to develop a distance learning system in the form of a mobile application «TopTaskerGeo», which performs the following functions: presentation of didactic materials in the most convenient and visual form, stimulating interest in learning and filling gaps in knowledge, review and analysis of training material, testing with choice of answers, monitoring and approval of results.

The implementation of the distance learning system in the mobile version can be carried out by one of the following options:

– as a mobile application written in Java, Kotlin, Swift;

– as a web-interface of the mobile site.

Mobile application «TopTaskerGeo» is developed by AndroidStudio application using Java programming language. The system functions on any device in the environment of Android operating system version 5.1 and higher.

We conducted a survey among the students of Al-Farabi Kazakh National University, majoring in Informatics. The data collection was conducted in online format using the online questionnaire voting.virtualedu.kaznu.kz. Since in the conditions of self-isolation it is not possible to conduct a survey at a personal meeting with the target audience of the study. Voting.virtualedu.kaznu.kz is a web-service, which was developed in the course of scientific research by scientists of the department «Informatics» of Al-Farabi Kazakh National University and is used at the university to conduct interactive feedback. The online survey is necessary for comparative analysis and allows easy and quick interpretation of the data obtained for analysis. We have developed a questionnaire to determine the effectiveness of mobile learning using the mobile application developed during this study. During the three-week experimental period, students were asked a series of questions aimed at determining the effectiveness of mobile learning and the effectiveness

of implementing mobile technology in the educational process. There are many ways to design questionnaires for pedagogical research. In accordance with the problem was designed questionnaire, which consisted of four questions: two closed alternatives (yes or no) and two open-ended questions. The questionnaire includes the following questions and answer options:

1. Do you want to use mobile devices in class?

A. Yes B. No

2. Why?

3. Do you think it is necessary to use mobile learning methods when studying disciplines?

A. Yes B. No

4. Why?

Thirty-three students and five faculty members participated in the study. The survey was conducted anonymously at the end of each week.

Results and discussion

In the course of the study, we developed the mobile application «TopTaskerGeo». The application is a distance learning system that is able to implement different types of exercises in the classroom, providing the active use of ICT. Students can perform interactive exercises using «TopTaskerGeo» application materials on mobile devices. The online service «TopTaskerGeo» is designed to support the learning process through interactive modules (apps, exercises). This service allows teachers to create, maintain and use educational modules, share experience between colleagues, optimize students' work (including the creation of new modules).

In «TopTaskerGeo» users are divided into the roles of administrator, teacher and student. Depending on the competence of the administrator role, the application can be used by a student or a teacher. When adding a new user, the administrator creates a login and password for it. After entering the login and password, if there is one in the database, the user data is saved on the device, and after saving the user data is redirected to the main service, which checks the type of user (Figure 1).

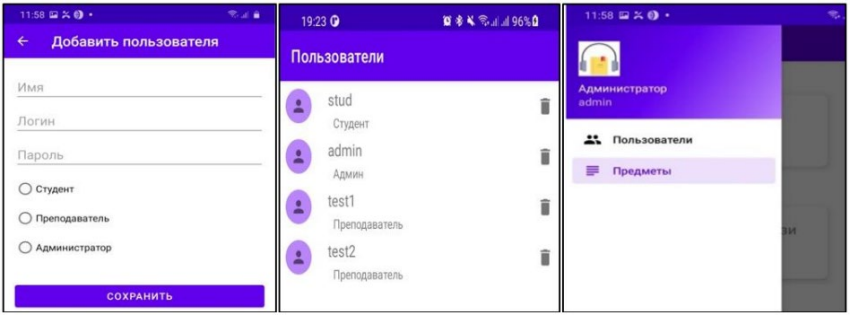

Figure 1 – Selection and assignment of users in the mobile application «TopTaskerGeo»

In the «TopTaskerGeo» mobile app, teachers can pre-create classes for students and track their progress and results using their smartphone. Students enter the class by applying code. In the «TopTaskerGeo» app, the student user can work in three modes: theoretical studies, exercises, e-teacher-led classes or assignments from the exam program.

The use of mobile technology in the goal-setting phase can encourage students to conduct small learning experiments. This is achieved by organizing simple lesson modules with different tasks and questions on different subjects. The program is freely available and users can use it in Russian and Kazakh. The advantage of the distance learning system developed by us is the ability to work online and offline. At the stage of presentation of new material oral explanations can be made in the form of a special video or live lessons through an interactive poster, presentation, electronic textbook. The presence of animated or video content allows students to become more interested in the topic. Innovative, unique learning materials not only immediately arouse students' interest, but also contribute to the desire to read the material in more depth and contribute to the stability of interest. Also keep in mind that interest in learning about a topic depends largely on the teacher's inspiration.

The use of ICT in education is not only useful for students, for the development of necessary skills, but also convenient for the teacher because assessment is carried out objectively. The most common variant of knowledge control in the subject is testing with closed and open test tasks. Teachers added by the administrator can log in to the application with their usernames and passwords, create groups of students and create subjects for them. Once subjects are added, teachers have the ability to add tasks. Tasks can be in the form of text or a report. Accessible and easy-to-use service «TopTaskerGeo» allows to create distance learning courses,

easily publish, comment and evaluate tasks, organizes effective interaction of all participants of the educational process. Teachers can create tests to check their knowledge.

Let's consider the advantages and disadvantages of the developed system of distance learning. The advantages of the mobile application «TopTaskerGeo» are: the student's ability to move freely while being online learning (no matter where the student is, he is always in touch); less need for books and papers; students can communicate with each other and with the teacher, which provides access to education for people with disabilities; mobile devices are very convenient for students, which can increase interest in learning for students with low motivation. The disadvantages include the fact that at any time the battery can run out and all unsaved data will be deleted from the device; the small screen of the cell phone limits the amount of information viewed; the amount of memory of the mobile device is much less than the computer memory; it is inconvenient to perform complex tasks using mobile applications, such as holding equipment in the hand on a mobile device, do a lot of laboratory work in chemistry, medicine or physics. For the most part, the disadvantages are technical in nature and can be easily remedied. By using a centralized database, when the app is reinstalled, all courses and student work are restored after logging into the account.

We conducted a questionnaire survey of students, the methodology of testing is discussed in the section «Materials and methods» of this article. According to the analysis of the answers of the online survey on the first question in the first week only 11 respondents answered affirmatively and expressed their desire to use mobile technology in the learning process. At the same time, some students responded that it was uncomfortable to work with and read from an additional interface on the phone. Students expressed that the use of devices was disturbing and interfered with concentration. However, it should be noted that in the second and third week, there was a positive trend in interest in mobile learning. In the second week , the majority of students responded positively to the first question on the survey. The online survey in the third week showed only 10 % negative responses from the total number of respondents. The main evidence of interest in mobile learning is that students have mastered the subjects because the learning process using mobile technology is interactive and modern. The dynamics of the growth of positive answers to the first question is shown in Figure 2.

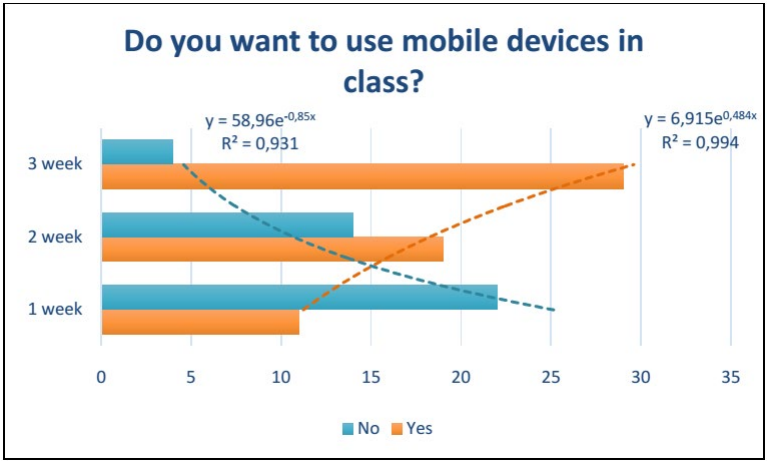

Figure 2 – Statistics of answers to the first question of the online survey

In the first week only 14 out of 33 students answered «Yes» to the third question. The analysis of the answers to the open fourth question of the questionnaire showed that, according to the respondents, traditional classes help to develop all the necessary skills and the use of mobile technology interferes with the learning of new material. Answering the third question in the third week of the experiment, most respondents noted the effectiveness of mobile learning methods. There was feedback that the use of mobile devices improves the development of information competencies, presentation skills, comprehension of learning material and effectiveness of information retrieval, as well as the speed of thinking and overall readiness of higher-education students to self-education. The dynamics of growth of positive responses to the third question is shown in Figure 3.

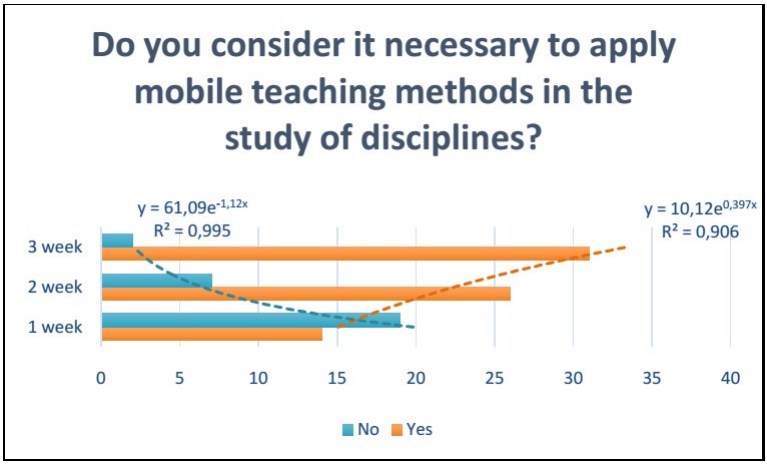

Figure 3 – Statistics of answers to the third question of the online survey

Conclusions

As a result of our research we have developed and tested the distance learning system «TopTaskerGeo», implemented as a mobile application. The system allows you to create learning subjects, assign certain teachers to a learning subject, publish courses for students, add attachments of common document formats to the course, evaluate the work of students of higher education institutions, create «question-answer» tests, displays notifications about new courses or assignments. The app allows distance learning for students online via smartphone. An online survey based on the results of the implementation of the mobile application «TopTaskerGeo» showed a positive dynamics of growth in the use of mobile technology and an increase in the level of information competence of students. This confirms the effectiveness of the use of mobile technology in the educational process. The results of the study can be used in developing curricula and transforming traditional lessons using interactive forms. The study has a high practical and scientific significance.

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*Н. Н. Керимбаев[1], И. Гарванов[2], *Г. М. Ткач[3]*
[1,3]әл-Фараби атындағы Қазақ ұлттық университеті,
Қазақстан Республикасы, Алматы қ.;
[2]Кітапханатану және ақпараттық технологиялар университеті,
София қ., Болгария.
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СТУДЕНТТЕРДІҢ АҚПАРАТТЫҚ ҚҰЗІРЕТТІЛІГІН ҚАЛЫПТАСТЫРУДАҒЫ МОБИЛЬДІ ҚОСЫМШАЛАРДЫҢ РӨЛІ

Бұл мақалада білім алушылардың ақпараттық құзыреттілігін қалыптастырудағы мобильді технологиялардың рөлі туралы қазіргі білім беру үшін өзекті мәселе қарастырылады. Мақаланың мақсаты-оқу процесінде мобильді технологияларды қолдана отырып, студенттердің ақпараттық құзіреттілігін қалыптастырудың негізгі тенденцияларын қарастыру. Мақала авторлары мобильді оқыту тұжырымдамасын берді, оның артықшылықтары мен кемшіліктерін талдады. Бұл жұмыста мобильді қосымшалар білім алушылардың ақпараттық құзыреттілігін қалыптастыру құралы ретінде қарастырылады. Зерттеу барысында әзірленген «TopTaskerGeo» мобильді қосымшасы білім беру ортасын ақпараттандыру мақсатында оқу процесіне мобильді технологияларды енгізудің өзектілігін растайды және студенттердің ақпараттық құзыреттілігін қалыптастыруда мобильді оқыту әдістерінің тиімділігін анықтайды. Авторлар жүргізген сауалнамаға сәйкес студенттердің мобильді оқытуға және ақпараттық құзыреттілікке қызығушылығының өсуі байқалады. Жаңалықтарды қабылдамайтын және дәстүрлі оқыту әдістерін ұнататын сауалнамаға қатысқан студенттердің біраз бөлігі болғанына қарамастан, «TopTaskerGeo» мобильді қосымшасын қолданатын сабақтар интерактивті және ақпараттық және коммуникациялық дағдылардың тез дамуына ықпал етеді. Зерттеудің құндылығы оқу пәндерін оқыту шеңберінде білім беру жүйесіне «TopTaskerGeo» мобильді қосымшасын әзірлеу және енгізу болып табылады.

Кілтті сөздер: мобильді технологиялар, ақпараттық құзыреттілік, оқыту процесі, қашықтықтан оқыту, білім беру.

*Н. Н. Керимбаев[1], И. Гарванов[2], *Г. М. Ткач[3]*
[1,3]Казахский национальный университет имени аль-Фараби,
Республика Казакстан, г. Алматы;
[2]Университет библиотековедения и информационных технологий,
г. София, Болгария.
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РОЛЬ МОБИЛЬНЫХ ПРИЛОЖЕНИЙ В ФОРМИРОВАНИИ ИНФОРМАЦИОННОЙ КОМПЕТЕНТНОСТИ СТУДЕНТОВ

В данной статье рассматривается актуальный для современного образования вопрос о роли мобильных технологий в формировании информационной компетентности обучающихся. Целью статьи является рассмотрение основных тенденций в формировании информационной компетентности студентов с применением мобильных технологий в процессе обучения. Авторами статьи дано понятие мобильного обучения, проанализированы его достоинства и недостатки. В данной работе мобильные приложения рассматриваются как инструмент формирования информационной компетенции обучающихся. Разработанное в ходе исследования мобильное приложение «TopTaskerGeo» подтверждает актуальность внедрения мобильных технологий в учебный процесс в целях информатизации образовательной среды и определяет эффективность методов мобильного обучения в формировании информационной компетентности студентов. Согласно проведенному авторами опросу, наблюдается рост интереса студентов к мобильному обучению и информационной компетентности. Несмотря на то, что существует небольшая доля опрошенных студентов, которые не приемлют нововведений и предпочитают традиционные методы обучения, занятия с применением мобильного приложения «TopTaskerGeo» интерактивны и способствуют быстрому развитию информационных и коммуникативных навыков. Ценность проведенного исследования заключается в разработке и внедрении мобильного приложения «TopTaskerGeo» в систему образования в рамках изучения учебных дисциплин.

Ключевые слова: мобильные технологии, информационная компетентность, процесс обучения, дистанционное обучение, образование.

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Торайғыров университеті
140008, Павлодар қ., Ломов к., 64, 137 каб.
8 (7182) 67-36-69
e-mail: kereku@tou.edu.kz
pedagogic-vestnik.tou.edu.kz