Mobile learning in forestry education

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Abstract. In the article the experience of using mobile learning in forest education is considered. It examines the phenomenon of mobile pedagogy, mobile learning, describes structure of mobile teaching. The application of mobile pedagogy in learning in forest education is described. The attitude to the using of mobile pedagogic in forest high education of teachers and students is shown. Different mobile applications that can be used in the educational process are described. The experience of implementation of methods of mobile pedagogic in forest higher education in Saint-Petersburg State Forest Technical University is shown. The importance of using mobile pedagogic in nowadays education is stressed, because such innovational approaches may allow raising the students’ motivation for learning. Possibilities for the development of mobile pedagogic in forest high education are shown.

1. Introduction

According to statistics, sales of mobile devices in Russia are growing from year to year [1]. The use of compact mobile devices such as mobile telephones, tablets, etc. is becoming more convenient and popular than desktop computers. Modern students cannot imagine their life without a mobile phone, with which they can work on the Internet, communicate through social networks, listen to music, read e-books, see films and find necessary information.

Very often teachers criticize contemporary students for using mobile phones in lectures because they feel it distracts them from the learning process. Modern gadgets are not a punishment for a teacher, but a way to open the door to a new educational space, a way to effectively organize their professional activities. Modern mobile applications are able to help teachers create lesson plans, track attendance, take notes on student behavior, keep in touch with students outside the classroom.

Today’s situation requires teachers to find ways to maximize the potential of mobile devices in order to optimize the learning process. Teachers often try to prohibit or even punish students for using mobile phones during lessons. However, progressive university workers believe that the use of mobile applications can make learning more effective. Virtually all teachers who are active supporters of mobile learning in Russia agree that a unique feature of mobile learning is its ability not only to modernize distance and mixed education, but also to optimize traditional education while maintaining all the basic principles.

Nowadays, the term mobile learning or M-learning has appeared which means learning with the help of mobile devices-phones, mobile telephones, tablets [2]. The distinguishing aspect is that M-learning applies for portable small technology tools while e-learning uses all learning and teaching
technologies, including mobile learning ones. M-learning applications generally reach to the learner via e-learning means [3]. M-learning has moved the education space from the classroom to the mobile screen.

According to UNESCO information, the tools enabling mobile learning and teaching are mobile phones, tablet computers, electronic readers, portable audio players and portable game consoles as well as notebooks and laptops [4].

Mobile learning (m-Learning) has a relatively long history. Already with the advent of the first mobile phones, and this is the beginning of the 90s, foreign teachers started talking about their didactic capabilities. And since 2002, the first international conferences have been held on the use of wireless mobile devices in teaching practice. This led to the creation of the m-Learning Consortium in Canada, bringing people together in learning communities such as, for example, World Academy Online (Digital and Mobile Learning Community), My Mobile University and others. In Russia, mobile learning has only started to develop in the last few years; in fact, it is a continuation of the process of integrating Web 2.0 tools into the educational process. That’s why the theme of implementation of the methods of mobile pedagogic in educational process in Russia and especially in forest high education is not nowadays investigated. It is interesting to understand pro and contra in using methods of mobile pedagogic in forest high education in Russia.

2. Methods and materials
The purpose of our research is to study the system of application of mobile learning in universities, as well as the status and prospects of mobile learning in forest higher education institutions. In the article the experiences of using mobile pedagogic in teaching of students in Saint-Petersburg State Forest Technical University (SPbSFTU) is examined.

At the time of the research, the principle of the set of research methods was used, which means that for solving the task of the investigation several methods, rather than one, are used. Among the methods that were used are: questionnaire, test method, conversation, description, method of summarizing the results obtained, analysis of scientific and methodological literature, Internet search, as well as a survey aimed at studying the attitude to using of mobile pedagogic in educational process in forest higher education in Russia from the point of view of teachers and students.

Performance analysis is a method of indirect study of pedagogical phenomena based on the results of training and education of people. Questionnaire - study of the results of education and training with the help of questionnaires containing written questions.

The materials that were analyzed in the article were received in the questionnaires that were given for the students after using the methods of mobile pedagogic. The number of students that gave their feedback for using Kahoot in the frame of the innovational week in Saint-Petersburg State Forest Technical University was about 100 persons per year. The questionnaire was given to the students for three years from 2017 to 2019. Totally about 300 questionnaires were analyzed.

The information the attitude to the using of methods of mobile pedagogic was received from 29 teachers, who are using these methods in the educational process. 20 teachers who do not use methods of mobile pedagogic were also interviewed. The received results were analyzed and conclusions about opportunity to use these methods in forest high education were made. The efficiency of such methods was also estimated based on the teachers’ and students’ opinion.

The information for the research was also taken from Russian and foreign sources of literature, from reports about the experiences of using methods of mobile pedagogic in different universities and in a studying programs for study in forest related companies.

The results of the analysis of student and teacher feedback questionnaires were the basis for developing proposals on the possibility and effectiveness of introducing mobile pedagogy methods in forest higher education.
3. Results and Discussion

Mobile learning is a part of e-learning activities. The distinguishing aspect is that m-learning applies for portable small technology tools while e-learning uses all learning and teaching technologies, including mobile learning ones. M-learning applications generally reach to the learner via e-learning means [5]. M-learning has moved the education space from the classroom to the mobile screen.

The main advantages of mobile learning are:
1. Mobile devices can be used anywhere and anytime.
2. Mobile learning is personalized. Each student can choose topics for study that require extra time and extra help.
3. Mobile learning is open and versatile as it allows students to participate in various learning activities. The student can choose the format, venue, method and organizer of the course.
4. Mobile learning increases the student's motivation to learn.
5. Mobile learning saves money and time as students can study at home and even during the holidays.
6. Mobile learning improves the digital skills of graduates and their competitiveness in the labor markets.

There are different mobile applications that can be used in the educational process. Among them are: the Kahoot app, the Google Classroom app, Seesaw, Teach Learn Lead, Zoom. The Kahoot application helps to prepare lesson materials and use them in a fun way, which is convenient to the students. The Google Classroom application allows sending out assignments, assessing their progress, making announcements for the students and involving them in different types of discussions. Seesaw is a way to create a portfolio of learners and track their learning progress. This application allows students to store upload and share their work with interested persons such as parents and teachers. Teachers may use the material downloaded through the application in the meetings with the students. Teach Learn Lead is designed for teachers who are interested in sharing experiences with colleagues. It is like a Facebook for a teachers’ community, a platform where you can organize discussions, share lesson plans, discuss career prospects or just talk about your students. Zoom has undoubtedly become the important application and communication center with so many people currently working, studying, or simply hanging out at home. Zoom is a powerful cloud video conferencing platform that allows you to host meetings or lecturing for the hundreds of participants. Using Zoom, educators can share lesson plans, give instruction, swap files with students, and communicate directly with the group or individuals via chat, all within the app. The free version of the app supports unlimited 1-to-1 meetings and a 40-minute time limit on group meetings.

The use of mobile pedagogy in forest education is currently insufficient. However, there are positive examples of such activities. At the Saint-Petersburg State Forest Technical University, several areas of mobile pedagogy are implemented in the educational process. The first direction is connected with the possibility of using mobile devices in the framework of practical classes for students. In this case students are given the task to find information on the given theme within the limits of group work for a certain period of time. After search of the information and presentation of results by each group discussion and formation of the correct answer to questions put on practical lesson is carried out. The second direction of using mobile pedagogy is testing students in different directions. Testing with the help of mobile phones allows carrying out the process at any time and in any audience, quickly getting and processing the results. Students do not need to move to the classroom with a desktop computer to perform tasks, it is enough to have personal mobile phones and Internet access.

One of the popular ways to test, didactic games and quizzes (quizzes) that is used in the educational process in forestry education is Kahoot, a free training platform. This application helps to turn a boring lesson to the game and motivate the students for learning. It helps to transform every classroom into the game show. Participants gather around an interactive whiteboard, projector or monitor. Students do not need to download any additional programs and applications to the participants' mobile phones or register an account, as Kahoot is accessible through a web browser. Students can participate in the
game anonymously (using the nickname). Students can play on their own, each with their own mobile phone, or work as a team, which improves communication between students. The test or quiz is created by an instructor and broadcasted from an Internet connected source. Students answer questions using mobile phones as well as tablets and laptops, the correct answers are turned into bonus points and leaders are identified. There are three creation options offered by Kahoot: multiple choice quizzes, discussion questions or surveys. At the beginning of the lesson, the teacher may use a survey or test to gather information about students' level of knowledge and to increase interest in the topic. Real-time feedback gives teachers in different disciplines the opportunity to adapt their teaching, to understand the level of knowledge of a group of students, its characteristics. At the end of the lesson the platform is used to test the learning results. Survey data shows that Kahoot increases the motivation of students by involving them in the learning process and also improves the quality of learning itself [6].

In the educational activities of the Saint-Petersburg State Forest Technical University in the educational activities of the Saint-Petersburg State Forestry Engineering University the platform is actively used by teachers at lectures, practical classes, as well as conferences, international meetings, annual innovation week INNOEVENT FTU. The platform was used for quizzes among students of various specialties in the classroom for more than 100 people, the time of the quiz -10-15 minutes.

Teachers, that are using this application in forestry education point out that Kahoot is easy to use (4.8 out of 5), is a motivating tool for learning for the students (4.7 out of 5), supports teachers' classroom teaching (4.2 out of 5), assesses students' knowledge (4.8 out of 5) and is an exciting tool for students’ learning (4.7 out of 5). Possible disadvantages include the interface in English and the need to organize an Internet channel.

According to the results of the surveys conducted in among students, 88% of the participants consider Kahoot useful, interesting and motivating, 5% are neutral, 7% are not satisfied. Those students who were not satisfied cited as problems unreliable connection to the Internet, difficult reading of questions and answers on the projected screen, impossibility to change the answer after submission, insufficient time for answering, the very competition and stress associated with the "exam". From those students, who were positive in using of Kahoot, 88% mentioned that their interaction and participation in lectures, 76% said they were more active in the classroom when Kahoot was used. 93% of respondents mentioned that Kahoot enhances the classroom environment.82% of students participated in the interview stressed that using of Kahoot helped them to answer to the test suggested by a teacher.

Another application that is used in educational process in Saint-Petersburg State Forest Technical University is Zoom. Zoom is used in an educational process in forest higher education a service for videoconferences, online meetings and distance learning. The program is perfect for individual and group lessons, students can log in from either a computer or a tablet with a phone. Anyone with a link or a conference identifier can connect to a video conference. The event can be scheduled in advance, as well as a recurring link, i.e. the same login link can be used for a regular lesson at a specific time. The advantages that has this application are: video and audio communication with each participant can be established, the screen sharing is possible with a sound, an interactive whiteboard is built into the platform and it is easily and quickly switch from screen sharing to whiteboard, there is a chat room where you can write messages, send files to everyone or select one student, the lesson can be recorded on the computer as well as on the cloud, students can be divided into pairs and groups like in a normal lesson, communication with up to 100 participants in the free version of the application can be established. One of the main problems of using Zoom, that was mentioned by the teachers, who used this application, was that the free account to this application allows having a video conference only for 40 minutes and then it comes a necessity to reconnect.

In the feedback of the students that participated in the lessons that used Zoom application, was showed that 75% consider the online lecture method quite effective, 25% did not have enough personal presence at the lecture.

Other applications are practically not used in high forest education. Also, it should be noted that so far efforts to integrate mobile learning into higher forest education have been sporadic. The main
problems associated with the introduction of mobile learning in higher forest education are: the small size of the screen and keyboard, the need for a wireless network, the risk of data loss due to the device discharging, the lack of teachers' skills and interest in using mobile technologies in educational activities [7]. Among these factors, the main obstacle to the development of mobile learning is the lack of interest among teachers in introducing it into the learning process. In this regard, projects aimed at improving teaching levels, access to education and learning outcomes by integrating mobile learning pedagogy into the learning environment can be an important area for effective implementation of mobile learning. The main goal of such projects should be to improve the skills and motivation of the teaching staff of forest universities in the systematic use of mobile technologies in teaching [8].

4. Conclusion
Global access to mobile devices, especially mobile phones, increases interest in m-learning every day. When the interest of people into the mobile technology is considered, mobile learning, with a blended design of technology, pedagogy and context can change the way of teaching and learning [9].

This gamification of learning enhances student involvement by involving all students, and combines both a common, rapidly developing learning environment and friendly competition [10].

Thus, today we can talk about several directions of application of mobile devices for educational purposes. Firstly, it is self-education; here we will also include the organization of autonomous work. This is made possible by the fact that the technology of mobile learning is based on such general pedagogical principles as accessibility and ease of use of material, interactivity, as well as, thanks to special applications, the possibility of self-control and self-assessment. Secondly, mobile pedagogic ideas can be used both in school and university traditional educational process. Thirdly, mobile learning can be an effective complement to a distance or corporate learning course conducted as for the students or for the company’s specialists.

Today's huge variety of mobile applications for teaching foreign languages undoubtedly provides all participants of the learning process with a useful tool that allows you to build an educational trajectory as effectively and efficiently as possible. It is important that these applications provide a wide range of opportunities not only for self-study, but also for learning within the learning community, not limited by time and space.

Mobile training has several advantages, among which we can highlight the following: usability much easier to place mobile devices than computers, and such devices take up less space, and sensory control makes them much more visible; greater degree of student interaction and teachers, students with each other (students can work together, share tasks in real time, send out information, discuss, seek additional information); high interest of students in working with mobile devices [11]. Attracting students who may have lost interest in learning for some reason is, in our opinion, very important, since the interest is directly related to the motivational aspect of learning, and positive motivation is important for the successful course of educational and cognitive activities of students.

Mobile learning, as an educational activity, can lead to the raising the interest and motivation of the students to learn. It allows them to study their favorite topics, anytime and anywhere, and to share them freely with friends. This is known as participation. Mobile learning focuses on activities that enhance knowledge through interaction. In this sense it can be concluded that mobile pedagogic help for the students to develop the communicational skills that are needed a lot in the era of digital economics.

In fact, the e-learning model is mobile learning through mobile technologies. Moreover, the ability to learn anytime and anywhere, which has the characteristics of e-learning, has become a reality with the development of wireless technology and mobile learning. By taking advantage of mobile learning the concept of life-long learning can be easily implemented on different levels of education, because all ages may be involved in educational process.

As a result of interactive communication with mobile devices and collaborative learning, their interaction increases. Mobile devices, in particular to provide relevant learning content, are presented in a variety of content-based applications. Different concepts for access from mobile devices can
enhance learning activities. Mobile learning, communication and multimedia capabilities of mobile devices can have a major impact on learning activities. Since many students are knowledgeable in information and communication technology, e-mail and short message services can be used with mobile devices. Universities should support students academically in this regard.

Mobile technology can be used to maintain and strengthen contact with students and faculty and, logically, to improve retention, the reasons students leave the course may be: distance from learning centers; insufficient academic support; insufficient information on counseling and laboratory classes; and other related information [11].

It follows from the above that mobile pedagogy offers new opportunities for students and teachers; mobile learning methods, techniques are easily applicable in environments of a modern university, and the use of mobile pedagogy significantly increases students' interest in learning.

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