

# READINESS FOR MOBILE LEARNING: MULTIDISCIPLINARY CASES FROM YAROSLAVL STATE UNIVERSITY

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## ABSTRACT

The survey data suggest a high technical and sufficient psychological readiness of Yaroslavl State University students to use mobile devices in learning. The results of the research prove that students have an above the average level of interest and motivation in learning with the help of mobile devices. Nevertheless, it is obvious that there is a need for popularizing mobile learning among students through organization of explanatory talks and encouragement on the part of the teaching staff. Two multidisciplinary cases with using modern IT-technologies in university educational process are presented.

## KEYWORDS

Mobile application, multidisciplinary cases, blended learning, cross-platform development.

## 1. INTRODUCTION

The organization of mobile learning in a classical university is a very complicated process requiring serious planning and coordinated actions of the educational establishment administration and teaching staff. The educational process organizers face the following challenges while implementing mobile technologies (Golizyuna, 2011):

- choosing the mobile technology's role and place in learning. Mobile devices can be used in different ways in educational process: both in the classroom and outside it, as an obligatory element of a course or as an additional one.

- assessing students' readiness for mobile learning. It is advisable to assess the level of students' technical facilities and competence as well as their psychological readiness before implementing mobile technologies in the educational process. It is reasonable to make a survey (questionnaire), the results of which will help make a deliberate decision about the necessity of using mobile devices in teaching and learning.

- choosing the strategy for providing students with portable devices:

- 1) BYOD (bring your own device) strategy – each student uses their own portable device. This strategy answers the purpose of mobile learning – to gain knowledge at any time and place – most of all. It is useful when students are technically well-equipped, thus avoiding considerable material costs.

- 2) providing the group with the devices belonging to the educational establishment – the supporters of this strategy mention such advantages as unified technical features of all the devices, the possibility to control learning activity and other such things that are impossible to do when students use their own devices.

The research concerning the level of Russian students' mobile devices facilities, which is a key factor in implementing BYOD strategy, shows that 100% of students have mobile phones and use them every day, while about 90% have smartphones with the Internet access and application installation facilities (Eremin, 2014; Son, 2013; Titova, 2013). Thus, the data, collected by different researchers, corroborate the students' mobile competence. Nevertheless, I.S. Son has pointed out that both students and teachers are ill-informed about the effective use of mobile devices in educational process (Son, 2013). Students in U.V. Eremin and E.F. Krylova's study expressed the same opinion: 75% of students voice fears that they might not be able to

cope with such activities without the teacher's advice and supervision because they "don't know where to start" (Eremin, 2014). These findings demonstrate the importance of the organizational factor in mobile learning as well as the necessity to give proper attention to the mobile learning organization issues in higher educational establishments.

Apart from the importance of having a mobile device with a necessary set of functions, it is essential for students to be psychologically ready to make their learning efficient. Psychological readiness for any activity indicates a psychological state when a person mobilizes resources to carry out some specific short-term or long-term activities or tasks (Titova, 2013).

Nevertheless, mobile learning, as any other type of learning, is based on the students-and-teacher interaction, taking place both in virtual setting and physical environment. Only one in six studies analyzed the problem of teachers' readiness for mobile learning. The survey (questionnaire) made by I.S. Son showed that only 15 out of 38 teachers approved of using mobile technologies in English language learning, while some teachers demonstrated skepticism and even disapproval of such learning (Son, 2013).

Besides analyzing students' technical and psychological readiness it is important to find out the advantages and disadvantages of using mobile technologies in learning activities. In the study devoted to students' foreign languages mobile learning, U.V. Eremin and E.F. Krylova pointed out the following positive features: a smartphone is always close at hand; one can get information at any place and time; one can devote time spent in public transport, queues and traffic jams to learning a foreign language; there is access to video and audio content in a foreign language (Eremin, 2014). Accumulator discharge and instability of the Internet access were mentioned among mobile technologies shortcomings (Titova, 2014). Such a project, devoted to foreign languages learning, was implemented in Yaroslavl State University (YSU) (Laure, 2016).

## **2. ANALYSIS OF MOBILE TECHNOLOGIES APPLICATION IN YSU**

Below we analyze the results of the students' survey at YSU revealing their readiness for using mobile technologies in learning.

### **2.1 Student Initial Testing**

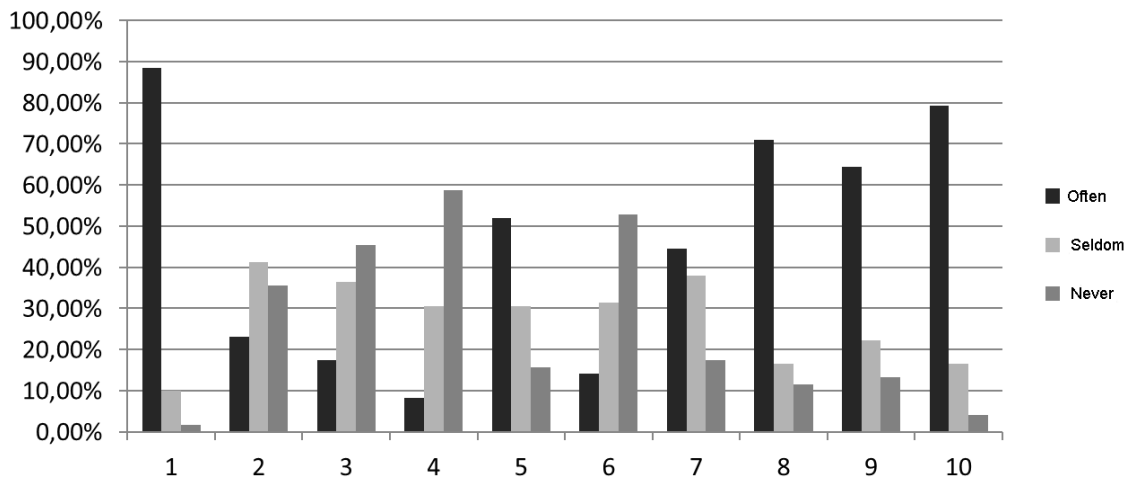
The students' survey (questionnaire) at Yaroslavl State University was based on a scheme of assessing students' readiness for mobile learning, which is described in different literary works. The first- and second-year students of the Law Faculty, the Faculty of Philology and Communication and the Faculty of Information and Computer Science took part in this survey. There were 121 respondents. According to the questionnaire data, all students have at least one type of portable device; 94,2% have smartphones, 26,5% - mobile phones, 43,8% - tablets, 30,6% - netbooks. In accordance with the presented data we can state that almost all participants are fully equipped with portable technical devices.

The next step after assessing the level of students' technical facilities is analyzing their skills to use different technical devices' functions, work with applications and employ mobile devices while learning. All these skills form the concept "competence in using mobile devices" or "mobile competence". Students were asked to estimate the frequency with which they use different functions and applications in learning. The results of the survey are presented in Figure 1.

The results of the survey show that students almost fully exploit the potential of their portable devices both in everyday life and in learning. While learning, students use Internet access, search engines, e-reference books/ e-dictionaries and applications for reading e-books. The frequency with which students use specific functions and applications corroborates their mobile competence.

The results of the research prove that students have an above the average level of interest and motivation in learning with the help of mobile devices. Nevertheless, it is obvious that there is a need for popularizing mobile learning among students through organization of explanatory talks and encouragement on the part of the teaching staff.

The survey also showed that about 17% of students have mobile learning experience. In general, portable devices were employed while preparing for the Unified State Examinations in Russia, learning foreign languages and other school subjects. The students' responses about such experiences are mostly positive, but many students mention inconveniences in using mobile devices in learning concerning the screen size, low quality of the teaching material and its design and the lack of timely consultations on the topic under study.



Explanation: 1 – Internet access; 2 – watching video files; 3 – listening to audio files; 4 – SMS/MMS messengers; 5 – applications for social networks (VK, Facebook, etc.); 6 – messenger-applications (WhatsApp, Viber, Telegram, etc.); 7 – e-mail; 8 – e-reference books/e-dictionaries; 9 – applications for reading e-books; 10 – search engines (Google, Yandex).

Figure 1. The frequency of using different applications on portable devices in educational process.

Let's look at two pilot projects for employing mobile technologies in the current educational process at YSU.

## 2.2 City Guide Application

The purpose of this multidisciplinary project is the development of the "City Guide" application, including a set of excursions around Yaroslavl for a specific user. The teachers and students of the Faculty of Information and Computer Science, the History Faculty, the Faculty of Philology and Communication took part in this process. The main stages of the project designing presented in the 'Project Activity' section for each group of students are shown in Table 1.

While developing the project, the client's role was played both by the teachers and students. It was an iterative application development: after critical analysis, the developers had to make a lot of improvement to the seemingly finished program with consideration for the defects detected during the previous cycle.

During the work on the project, the following training targets and learning tasks were achieved:

- reconstructing the specialist's future activities context: the students of the Faculty of Information and Computer Science went through the full mobile application development cycle, the students of the History Faculty planned a real excursion, the students of the Faculty of Philology and Communication translated the presented material.

- reconstructing the future professional activity sociocultural context: the students worked in a real professional team adopting particular roles, interacting with each other.

- learning the specific features of other students' future professions and professional activities.

- developing personal qualities and professional skills while developing a high-technology product.

- working on a real, topical present-day problem: unlike classical laboratory and practical work where the test subject is mostly trivial and outdated and the task is artificially created, the students worked with real material in natural working conditions fulfilling an actual task to develop a product which is in a high demand on the market.

The result of the project is a completely developed application, City Guide, which can be useful both for the citizens of Yaroslavl and its guests.

Table 1. The main stages of the project designing for different groups of students.

	The students of the Faculty of Information and Computer Science	The students of the History Faculty	The students of the Faculty of Philology and Communication
Needs assessment	Assessing social and educational significance of the product under development.		
	Examining the existing products in application stores for portable devices.	Accumulating information about the existing excursion routes, discovering 'blank spaces' on the tourist map of the city.	Gathering information about the tourist services market, including the necessity of creating a bilingual version of the application.
Planning	Joint analysis of the data, accumulated during the first stage. Evaluating resources and costs necessary for the application development. Initial schematic introduction of the application structure and interface that ensures the tasks understanding by each group of students.		
	Modelling of application domain, choosing the platform, defining objectives, developing software architecture.	Collecting material for the excursion.	Collecting material for the excursion.
Implementation	Joint selection of the specific logical implementation model, subsequent assessment of the work coordination of the implemented components set		
	Developing an application with a definite set of functions and a user-friendly interface, inputting the content, created by humanitarian students for the application	Developing several excursions, gathering visual and audio content for each part of the excursion.	Translating the texts of the excursions, created by history students into English. Recording audio files in English.
Critical analysis	Assessing final application functionality and functioning correctness, evaluating learning significance of the work performed		
	Elimination of defects, code optimization.	"Full-scale testing" of the application on relatives and acquaintances; completeness analysis of the submitted information.	"Full-scale testing" of the application on students with a good level of English; assessing the quality of the translation and pronunciation on the record.

### 2.3 Study24Seven Application

This project is aimed at developing and testing the system of a blended educational project for pursuing a Masters in technical and computer sciences (Horn, 2014). The humanitarian course "The history and methodology of science" for YSU postgraduate students, specializing in "Information and communication technologies and communication systems", was chosen as a pilot project (Kovarik, 2011).

The choice of the pilot project is based on the following factors:

- students with the technical specialization have an extremely low level of humanitarian knowledge (the existing methods of giving lectures and presentations don't work properly);
- a very low percentage of technical students go to the library;
- such students demonstrate low activity during the term;
- there is an immense body of high-quality materials on the history of science (e.g. films by Leonid Parfenov "Zworykin-Muromets", films about Nicola Tesla, video materials devoted to the invention of radio, the Silicon Valley and other innovation clusters), which are publicly available.

To work out the cloud system of blended learning, it was decided to choose the cross-platform mobile and web-development (Corral, 2012; Xanthopoulos, 2013). The most popular today are the mobile iOS and Android platforms. The advantage of this product is that one can use this app on several initially incompatible platforms using one code. This minimizes the product costs as it is enough to have only one software developer create the mobile application suitable for all platforms. The shortcomings of the product are the limited apps characteristics in comparison with native apps. The second drawback, the general design

of the interface, is, to some extent, an advantage as well. No matter which platform is used it will have the same interface and screen logic. The complete application is compiled in the form of installation packages for every mobile operating system. The developers created a system with 4 quick login options: via e-mail, facebook, vk and twitter.

### **3. CONCLUSION**

The survey data suggest a high technical and sufficient psychological readiness of Demidov Yaroslavl State University students to use mobile devices in learning. The City Guide project creates the interaction of students of humanitarian and technical specialties: having the experience of collaboration with colleagues with a different mentality is useful for both the students of humanities (it increases their competence in the field of ICT), and for technical students (it raises their level of culture, language knowledge, etc.).

The developed mobile application Study24Seven is cross-platform and is suitable for modern versions of the iOS and Android operating systems. This result is achieved both through the application architecture and the use of PhoneGap/iOnic technology. The development of appropriate methods of the blended learning system will increase the efficiency of teaching the Humanities to students of technical specialties.

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### **REFERENCES**

- Corral, L. et al, 2012. Potential advantages and disadvantages of multiplatform development frameworks – a vision on mobile environments. *Procedia Computer Science*, vol. 10, pp. 1202–1207.
- Eremin, Yu. and Kryulova E., 2014. The use of mobile technology in the students tasks in a foreign language study. In *Izvestia: Herzen University Journal of Humanities & Science*. No. 167, pp. 158-166.
- Golizyuna, I. and Polovnikova N., 2011. Mobile Education as a new Education Technologies. In *Education technology and Society*, No. 1, pp.205-211.
- Horn, M. et al., 2014. *Blended: Using Disruptive Innovation to Improve Schools*. Jossey-Bass, Wiley.
- Kovarik, B., 2011. *Revolutions in Communication: Media History from Gutenberg to the Digital Age*. Bloomsbury Academic.
- Laure, D. et al, 2016. Cross-platform Development for Sailfish OS and Android: Architectural Patterns and "Dictionary Trainer" Application Case Study. *Proceedings of 19th Conference of Open Innovations Association (FRUCT)*. Jyväskylä, Finland, pp. 145-150.
- Son, I., 2013. Mobile Education for foreign language study. *Proceedings of International Conference "Education in modern world: theory and practice*. Sankt-Peterburg, Russia, pp. 164-167.
- Titova, S. and Avramenko A., 2013. The evolution of learning tools in teaching foreign languages: from the personal computer to smartphones. In *Vestnik of Moscow State University (Linguistics and Intercultural Communication Series)*, No. 1, pp. 4-12.
- Xanthopoulos, S. and Xinogalos, S., 2013. A comparative analysis of crossplatform development approaches for mobile applications. *Proceedings of the 6th Balkan Conference in Informatics*. Thessaloniki, Greece, pp. 213–220.