

# ORGANISATION OF MOBILE LEARNING AT TOMSK STATE UNIVERSITY: STUDENTS' PERSPECTIVE

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## Abstract

The study focuses on the use of mobile devices in learning in TSU students' environment. The paper reveals that TSU students highly appreciate the benefits from using mobile devices in learning. Also the research shows correlation between student's age and frequency of mobile devices usage. Younger students tend to evaluate mobile technologies more than the older ones. All respondents expressed wish of usage specialized mobile applications which helps to access course content. Second part of the research was conducted with content-analysis of open questions. Respondents point out that main disadvantage of mobile technologies is a distraction factor, but overall these technologies are very helpful. In addition respondents mentioned that perfect device for learning should restrict usage of entertaining applications on software level. Authors describe the specifics of the use of mobile technologies depending on the subject area, the year of study and sex.

Keywords: Mobile Learning, distance education, mobile devices, personal learning environment.

## 1 INTRODUCTION

Achievements in the sphere of wireless information and communication technologies have made mobile devices available to a wide audience. It encouraged lecturers and researchers to consider them as a new tool in education. Mobile technologies are becoming more personal. Mobile device can read the physiological state of the learning to detect the learner's emotions. Gamification is playing an increasingly important role in the mobile learning [1] Researchers highlight "a high didactic potential of mobile devices and technologies which can be helpful to the new educational model of higher school in case of their proper integration ([2],[3]). Most studies on m-learning focus on its effectiveness [4], while noting positive effects of the technologies on learning ([5], [6], [7]). The negative effects of mobile learning are also discussed [8].

Lots of studies are devoted to students' expectations [9] and attitudes [10] towards m-learning within one educational institution. Researchers write of generally positive attitude of students [11] and insignificant differences in their answers by sex [12]. Positive attitude can be also revealed in students who have never experienced m-learning [13].

In Russia, m-learning is still developing. Students use mobile devices both during classes and at home preparing for classes. M-learning is not fully integrated into the educational process ([14], [15]). The questions that we have addressed in this paper are:

- which mobile technologies are used by students in education;
- how do students assess the effectiveness of the use of mobile technologies in education;
- how do students assess application of mobile technologies in education?

One of the tasks is to find a correlation between answers and age, sex and subject area of students.

## 2 METHODOLOGY

The research is based on sociological study conducted by the means of questionnaire. TSU students were given survey questionnaires. The respondents were divided into three groups: natural sciences (Physics, Biology, etc.), humanities (Philology, History, Philosophy, etc.), and engineering (Applied Mathematics, Physics and Technology, Information Sciences, etc.). The sample size is 300 people. The survey questionnaire encompasses 14 close questions and 3 open questions [16].

The data were processed using the SPSS package. The research focuses on the analysis of the contingency tables. The open questions are processed using content analysis.

### 3 RESULTS

#### 3.1 Close questions

The results of the analysis demonstrated that most TSU students use smartphones (82%) and tablets (18%). 68% of respondents give “good” and “excellent” marks to the usefulness of their devices in studying at university, thus, recognising the functionality of mobile technologies. Answering the question “Do smartphones and tablets help study or distract from it” the half of respondents (50%) indicated that mobile devices help them, while 19% of respondents said that mobile devices distract them from studying. However, there is a high percentage of respondents (31%) who find it difficult to give a definite answer.

Despite the fact that students highly appreciate the functionality of devices in learning, they also cannot define to what extent these devices help them. When positive feedback on using mobile technologies in education prevailed, lecturers expressed their indifferent or negative attitude towards it. The half of respondents (54%) indicated that lecturers do not care whether they use mobile devices. 21% “prohibit and do not encourage” it. Among the most popular mobile applications used for educational purposes were selected (by frequency): browsers (93%), translators and dictionaries (81%), scheduling (79%), e-reading (67%), e-mails (58%), social media (42%), calendars and PDAs (39%).

The analysis showed that students of bachelor’s and specialist’s programmes (the fifth year students) use mobile technologies more actively than master’s students. Answering the question about the frequency of using smartphone/tablet in education, 64% of bachelor students and specialist students said “always, every day”. While only 35% of master’s students use their devices every day. Most master’s students (38%) use their devices several times a week. Moreover, they accentuate less utility of m-learning: on average, 46% of students from the first to fifth year of study give “excellent” mark to mobile devices for their utility in education. Only 16% of master’s students appreciate it.

Bachelors use e-reading applications and mobile scheduling applications more often than specialists and masters (Tab. 1). However, e-mails and calendars and PDAs are much more popular with master’s students and specialists.

Table 1. Mobile applications popular with: 1- bachelors; 2 – specialists and masters.  
The average for each group (in %)

Applications	Bachelors	Specialists, Masters
Schedule	<b>82</b>	55
e-reading	<b>75</b>	57
e-mail	54	<b>81</b>
Calendars and PDAs	40	<b>56</b>

When comparing the specifics of using mobile applications for educational purposes by subject area, it turned out that students of engineering and natural sciences use applications for working with graphs and images as well as computing applications (mathematical, statistical) more often than students of humanities (Tab. 2). Representatives of engineering areas are leaders in using calendars and PDAs (48%) and educational games (16%). E-mails are popular with humanities (69%). Translators and dictionaries (81%) along with e-reading applications (67%) are popular with all specialties.

Table 2. Specifics of using mobile applications in education by subject area (in %)

	Engineering	Humanities	Natural sciences
Translators and dictionaries	<b>83</b>	<b>83</b>	<b>76</b>
e-reading	<b>72</b>	<b>65</b>	<b>66</b>
e-mails	47	<b>69</b>	43
Calendars and PDAs	<b>48</b>	38	36
Camera	<b>72</b>	57	<b>75</b>
Applications for working with graphs and images	<b>22</b>	12	<b>20</b>
Computing applications	<b>40</b>	15	<b>45</b>
Educational games	<b>16</b>	13	9

Furthermore, teaching staff in natural sciences and engineering feel the need in mastering applications to solve computational tasks. Lecturers of all faculties are interested in working with applications providing the access to materials of the courses, web-sites of faculties and universities, assessment applications. It should be noted that humanities are significantly interested in applications that help work with educational courses.

The sex-based analysis revealed that female-students use mobile technologies for shorter period of time but more frequently than male-students: 10% of men and 21% of women use mobile devices less than a year; 51% of women and 62% of men use smartphones and tablets over two years. 65% of women and 51% of men use mobile devices in learning every day. The interesting fact is that 58% of men and 76% of women keep their smartphones or tablets on the table; while 36% of men and only 8% of women keep them in the pockets. Women also keep their phones in the bag more often than men: 15% and 5% respectively. There is no significant difference in using applications by men and women. Nevertheless, women use e-mails (W:M=62%:50%) and educational games (W:M=22%:14%) much more frequently than men. Translators (M:W=71%:62%) and cloud storages (M:W=30%:16%) are more popular with men.

Of great interest are the results of comparison of the requests for applications that students would like to use in educational process, but do not have them or do not know how to use them. On average, men selected almost all applications more often than women (Tab. 3). We explain it by the lack of interest in women to the applications; otherwise, they already use them in educational processes. Let us note that respondents absolutely agreed on the applications providing the access to materials of the courses and cloud storages.

Table 3. Desire to use applications in education: by sex (in %)

	Men	Women
Browsers	<b>14</b>	7
e-mails	<b>16</b>	10
Cloud storages	<b>18</b>	<b>19</b>
Social media	<b>14</b>	7
Camera	<b>19</b>	8
e-reading	<b>22</b>	12
Computing applications (mathematical, statistical)	<b>29</b>	14
Access to materials of the courses	<b>53</b>	<b>54</b>
Applications for working with educational course	<b>50</b>	32

## 3.2 Open questions

The questionnaire offered three open questions that permit supplementing the results of statistical analysis. The questions were analysed using content analysis. A part of the statement whose semantics is relevant to the categories was considered as a unit.

### 3.2.1 *What do you think, how would your studying change without mobile devices?*

91 respondents answered the question (hereinafter equals to 100%). 98.9% of them are women; there is only 1 man. Most respondents are bachelor students (81.3%) of humanities (63.7%). Among the participants there are also the representatives of engineering (13.2%) and natural sciences (23.1%). The results of content analysis are presented below.

Almost all respondents (90%) admit the importance of mobile devices in changing educational process. 10% of respondents believe that the devices are not too important to education: they almost do not participate in the process/ we write with chalk on the board and make poor presentations three times a year/ on English classes only. It is time-consuming to search the unknown words in dictionaries. Nothing else has changed.

Most respondents think that mobile devices have changed the learning process to the better (69%). Others demonstrate their negative attitudes towards the changes (19%). According to the respondents, among the main advantages of using mobile devices are:

- faster data processing (31%);
- time-saving (23%);
- saving physical resources, i.e. no need to carry heavy books, no calluses caused by writing with a pen (13%).

Less important categories encompass economically sound (7%), higher effectiveness of learning (5%), binding to a specific learning space, home or library (5%), greater interest to learning (4%). Some people also mentioned the categories of saving natural resources and getting in touch with a lecturer.

8% of respondents believe that concentration of attention will increase without mobile devices: People would be more attentive during the class/ I would be more concentrated during boring lectures/ it will also enhance the acquisition of information (5%): the course will take more time, but you will memorise more. It will get into your brain, if you think but do not google. We are always in a hurry: too much information, too little sense. Some respondents indicate the growing interest to reading (2%) and unbiased assessment (1%).

### 3.2.2 *What are negative aspects of using mobile devices in learning?*

141 respondents answered the question (hereinafter equals to 100%). Most of them are women (68.8%). This question was the most discussed open question. Most respondents are bachelor students (83%) of humanities (58.2%). Among the participants there are also the representatives of engineering (20.6%) and natural sciences (21.3%). The results of content analysis are presented below.

Although the question implied some negative aspects of using mobile devices, 10% of respondents answered that there are no any drawbacks. 9 people explained their point of view saying that devices are neutral and everything depends on people's motivation: none, everything depends on people. If people want to study, they do. If they do not want, they will not become more interested in studying even without their mobiles/ As for me, there are no any. Everything depends on people. If a person is addicted to social media and games, it is quite difficult for them to stay concentrated. I do not have such a problem/ If a person is distracted by social media or other stuff, the fault is not in device. Just decide, what is more important for you.

The respondents see the main problem in the fact that mobile devices distract students' attention and switch it to the screen when studying (78%). Social media (34.8%) and games (8.5%) are the first reasons for leaving the real world for virtual reality. The respondents talk about the addiction to mobile devices (6.4%): We cannot control ourselves/ It is difficult to make yourself listen to the lecturer and not play or surf social media/ They distract and make us addicted to mobiles. Some respondents think that using such technologies is harmful to health (8.5%). The respondents believe that information received through mobile devices is acquired and memorised worse (2.8%); there is a decline in mental

abilities (5.7%): I am not trying to memorise anything; I stopped thinking/ I easily forget new information received through mobile devices/ You cannot calculate complex tasks in your head; you memorise less/ You use calculator to solve an easy task. Among the disadvantages the respondents list a chance to copy (4.3%). 3.5% of respondents blame technical characteristics of devices: poor battery life, inconvenience in using the screen.

### 3.2.3 *What is an ideal device for learning purposes?*

114 respondents answered the question (hereinafter equals to 100%). Most of them are women (64.9%). Most respondents are bachelor students (83.3%) of humanities (59.6%). Among the participants there are also the representatives of engineering (16.7%) and natural sciences (23.7%). The results of content analysis are presented below.

Answering the question, 37.7% of respondents indicated the type of device: tablet is ranked first (25.4%); smartphone is close second (8.8%); laptop takes the third position (2.6%); the respondents also named e-book. 10% of respondents gave names of existing models or manufacturers, here belong MacBook, iPad, Nokia Lumia, tablet Nexus 7, tablet Z Canvas and others.

The main feature of a learning device is the presence of numerous learning applications (27%) or event special operating system (1.8%). Although the device must have the Internet connection (14%), it also must have strict limitations on the use of applications irrelevant to the learning process or banning access to irrelevant web-sites (22.8%). The respondents identify some technical parameters of the device: compact (9.6%), screen size (7.9%), battery life (6.1%), fast data processing (6.1%), camera and possibility of projecting images, absence of vibrate mode.

It is worth noting that 18.4% of respondents tend to think that there is no ideal device for learning, since everything depends on people: There are no universal things. Every person makes their own choice. What is better or more useful during the study/ If a person is not interested in this or that subject, the use of device will not have any positive effect on the student.

## 4 CONCLUSIONS

In general, the respondents realize the importance of mobile technologies to learning process. The software component is more important than hardware for students. The study revealed the correlation between age and frequency of using mobile devices: younger students use the technologies more often than the older ones. Despite all the benefits, e.g., data processing, mobile technologies have some negative issues. Many respondents feel lack of control when using devices. Students note indifferent or negative attitude of lectures towards the use of mobile devices during the classes. Currently, mobile educational technologies are rapidly evolving, students' attitudes toward mobile learning is also changing. Researchers need constantly to identify the attitudes of students to analyze changes in the educational process in the mobile learning and evaluate the effectiveness of new educational technologies.

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