

The Third Wave of Informatization

Mobile Learning and Social Networks in the Modern School for Upgrading the Educational Process

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1 RESEARCH PROBLEM

Since the mid of 1980s Russia is going through series of educational reforms related to a number of initiatives on computerisation and informatization of secondary schools. The first wave of informatization of educational institutions started in the 1980s, when as part of the federal reforms, and then at the regional level, Russian schools were equipped with computers and basic information technologies. In addition, a new course - “Informatics” was introduced and included into curriculum. It also involved training for teachers and school administrators. At the same time the reforms were challenged by a number of problems due to a huge gap between urban and rural schools.

The second wave of informatization started in the 1990s and aimed to increase the accessibility to computers through the provision of schools and their administrative units with the modern IT computing technologies, audio-visual equipment as well as access to Internet. In order to advance and integrate modern technologies into the learning process teachers were provided with a series of trainings courses. Despite the initial resistance from teachers, the implementation of the initiative was successful and had a significant impact on the educational process (OECD, 2015). The federal program of informatization of the Russian schools has been completed in 2010, and from that moment all responsibilities regarding informatization of schools were transferred from federal to the regional level.

Meanwhile, computer and Internet technologies are developing very dynamically in Russia. Between 2010 and 2015 there were major changes in Internet access technologies, the speed of information transmission, and the range of devices to interact with the web. Currently 97 percent of Russian adolescents have their own mobile devices (D.Koroleva, 2016). Despite an official ban, K-12 students still use their cellular phones or tablets at

school. Social network sites are most popular resource among adolescents; they use the service for communication, information distribution and its consumption. Thus, the observation shows that the educational landscape changes rapidly because of several reasons:

- Schools are filled with students’ mobile devices;
- The access to high – speed Internet in classrooms;
- The availability of information;
- The communication mediated by social networks.

Despite of the extensive usage of the web in Russian schools there are no concrete recommendations for mobile learnings or social networks for educational use. Moreover, education legislative framework is full of contradictions: some official documents envision Internet as a resource which is full of risks and dangers, and it is necessary to prohibit its usage in the schools. At the same time other government paper gives a recommendation to use E-learning at schools; however, it does not specify how and why it should be used for educational practices. Thus, this research will attempt to investigate the peculiarities of schools’ reactions to these changes, which implied not by the federal government, but brought by students themselves as main users of the web and mobile devices.

The following research questions will guide this study:

- How do mobile technologies and social networks change the educational space in Russian schools?
- How the use of mobile phones and social networks in schools is described in official documents?
- How do instructors incorporate the Mobile learning and social networks into their instructional strategies within their

courses?

- What kind of administrative and psychological difficulties teachers experience while using the modern technology?
- What are the technical and psychological readiness of students for using the modern technologies in the learning process, including the involvement of mobile devices and social networks in the educational process at school?

2 OUTLINE OF OBJECTIVES

This research project will attempt to investigate the peculiarities of schools' reactions to changes related to the use of mobile technologies and social networks, which implied not by the federal government, but brought by students themselves as main users of the web and mobile devices.

Objectives:

- To describe the existing and most promising educational practices of mobile phones and social networks usage in education for making learning more active, increase students motivation, update curricula without needing to change their nature, etc. (Russian and international experience).
- To examine the actual stage of mobile phone and social networks usage for educational purposes among high and middle school Russian teachers.
- To analyze students attitudes and desire to use their own mobile phone and social networks due to the teacher instructions.
- To identify the administrative and technical terms of use mobile phones and social networks in the modern Russian schools.

3 STATE OF THE ART

Many notions were created to describe the modern adolescents generation and their high interest to Internet and modern technologies: it is "net generation" (Tapscott, 1998), "digital natives" (Prensky 2001), "generation digital" (Montgomery, 2007), "generation Z" etc. Social media becomes one of the most used types of websites by adolescents. According to statistics on social networks 90% of U.S. teenagers (Perrin, 2015), 63% European students from 9 to 16 year olds (EU Kids Online, 2013) and 97% of Russian adolescents (Koroleva, 2016) use social networking sites as a

platform for interaction and communication. The phenomenon of social media emerged in the 1990s and received the mass distribution over the past 10 years. The interface of the majority of social media has been adapted for touch screen displays and social networks become available on mobile devices. This proved to be an important factor in social media diffusion among teenagers. Nowadays, aided by the convenience and constant access provided by mobile devices, especially smartphones, 92% of teens report going online daily - including 24% who say they go online "almost constantly," according to Pew Research Center study (Lenhart, 2015). This raises the question of schools' reactions to social situation of child's development change according to Vygotsky's social constructivism theory (Vygotsky, 1978).

The use of mobile technologies as a unique element of education reform is discussed in Shuler's work (Shuler, 2009). This report draws on interviews with a cross-section of research, policy, and industry experts to illustrate how mobile technologies such as smartphones, iPods, and portable gaming platforms might be widely used for learning. The idea of personal mobile systems for life-long learning was given by Educational Technology Research Group from UK (Sharpley, Corlett, Westmancott, 2002). According to the authors, the re-conceptualisation of learning is that the environments where contextual life-long learning occurs cannot be pre-specified, but are created through the activity of learning: how schools designed curriculum for mobile technology implementation, as well as how students and teachers responded to this innovation afford a case in point (Looi, Chee-Kit, et al., 2016). A constructivist manner study realized by Bielaczyc and Collins describes "Learning-communities" approach to education (Bielaczyc & Collins, 1999). According to authors, in a learning community the main goal is to advance the collective knowledge and in that way to support the growth of individual knowledge. An opportunity to transform the rules and processes relevant to face-to-face communication in the context of web-based e-learning described in Hung and Chen paper (Hung & Chen, 2001). Hung and Yuen claim that a sense of community appearing in a social network is an essential element for successful e-learning (Hung & Yuen, 2010). Social networks in schools as a barrier or facilitator for educational reforms is a key issue discussed in the book "Social Network Theory and Educational Change" (Daly, 2010).

4 METHODOLOGY

The mixed methods design was chosen to conduct this research. According to Creswell, research strategy consists of two stages. First stage includes the process of quantitative data collection, and the second step implies on qualitative data in order to explain or elaborate on the quantitative results (Creswell, 2005).

The following quantitative research tools are used in this study:

- Document Analysis;
- Meta-analysis (Analytical review of empirical studies);
- Survey among High school students (Stratified random sampling);
- Survey among public schools principals (Random sampling);
- Survey among public and private schools teachers (Random sampling).

Qualitative Research Tools included:

- Middle and High school students interview;
- School teachers interview;
- Public schools principals interview;
- Workshops and focus group discussions for teachers.

5 EXPECTED OUTCOME

In order to provide a general picture of the research problem the initial data was obtained through meta-analysis, state documents analysis and surveys.

On the second stage, qualitative data such as semi-structured interviews with adolescents and teachers, as well as focus group discussions for educators were used to gain additional information that further enriches the research base.

Meta-analysis

First the meta-analysis of foreign studies (publications in English) on the use of social networks in teaching practice was prepared. Russian articles have not been taken for analyses because this problem is not articulated in Russian publications (the lack of empirical data).

The review of the literature provided descriptions of social media as a potential new resource, which provides the organization of teacher-student interaction, students' group communication, and increases student's involvement in the learning process. For meta-analysis I have selected

publications about social networking in education over the past 3 years, which satisfies the criteria of describing the details of empirical research. Literature search was organised in the following databases: ProQuest Dissertations & Theses Global, ProQuest Education, Dissertation Abstracts Online, Google Scholar. In total, 205 English language publications was obtained, and 8 studies were selected for compliance with the specified criteria.

The obtained literature had to provide with information on which social networks are mostly used for educational purposes and what kind of services are involved, as well as what kind of social media is used in education. The received data are presented in Table 1.

Another step included finding data about positive and negative aspects of social networks in education.

The analysis showed that social media is used in two main ways: 1) as service for support and operationalization of existing forms of learning, and 2) for upgrading the educational process. It also confirmed the presence of the «digital gap» between students and teachers. Positive aspects of the use of social networks for education are associated with a variety of activities of students, and negative aspect included low ICT literacy and higher workload of teachers. These data are presented in Table 2.

High school student survey

The survey included 16–18-year-old students of Moscow schools was conducted in order to assess how the Russian schools use mobile technologies and social media in the learning process. Stratified random sampling was chosen for the study, the sample covered 3,194 respondents with percentage 45.2% of males and 54.8% females. Data was collected in 2014 and analyzed in 2015. The results showed that 97 % of urban teenagers have their own mobile devices. Social network sites are most popular web-sites, and they use them for communication, information distribution and its consumption. Despite official school bans students use their cell phones or tablets while at school both for the entertainment (70%) and self-education purposes (70%). While technologies such as BYOD (Bring Your Own Device) are not welcomed by teachers, analysis of intensity and scope of unauthorized Internet usage during the learning process among adolescent and their academic performance did not give statistically significant correlations. Speaking about school computer equipment, more than half of respondents (56%) noted that access to school computers or other devices (laptop, tablet, etc.) is limited. Students can visit computer class only in special hours and

usually during the “Informatics” course. At the same time, even at home, teens prefer to use their personal mobile devices than desktop computers. Simultaneously, survey data shows the obvious progress of the schooling system: present-day teachers communicate with their students by email and via social networks and occasionally give homework assignments online or using internet services. Thus, survey data shows that school institution suddenly found itself in a situation when the auditorium began to represent itself as a community of advanced Internet users who are constantly online and switch easily between education, communication, and entertainment. On one hand the school system is trying to control the situation through bans on the use of mobile telephones, and the limitation of Internet access. On the other hand, teachers use innovative practices, but it depends only from teacher’s willing and interests. It was assumed that usage of modern technologies in schools and availability of personal devices for schoolchildren in Moscow and other big cities are ahead with respect to small towns in the province. For this reason in the parallel with the key study was conducted the study with smaller sample to examine the actual stage of modern technologies usage for educational purposes in different contexts. The survey included 16–18-year-old students who live and study in Moscow (population 10 m), Krasnoyarsk (population 1m), Achisk (population 0,1 m) and Bolshaya Murta (0,07 m). The study covered 252 respondents. Collected data showed small differences in availability of personal devices for school children, at the same time according to the responses the usage of modern technologies in schools in the region and province is significantly lower than in Moscow. This once again underlines the existing deficit of existing educational practices of mobile phones and social networks usage in education against the background of social situation of child’s development change.

Document Analysis

About 100 documents of the school’s and regional and state level have been analyzed. Data obtained through document analysis highlighted the contradictions regarding usage of mobile technology and social network in education. As mentioned above, the analysis shows two waves of informatization programs in Russian schools. The first wave of informatization of educational institutions started in the 1980s, when as part of the federal reforms, and then at the regional level, Russian schools were equipped with computers and basic information technologies. During the second

wave, which started in the 1990s, the goal of the federal government was to increase the accessibility to school computers and to provide them with modern IT computing technologies and audio-visual equipment as well as to provide access to Internet. Described waves were accompanied by teachers and school principals training programs; however, initial resistance was observed from teachers to incorporate new practices into their work. The described initiative of informatization of Russian schools has been completed in 2010 and from that moment all responsibilities regarding technologies was transferred from the federal government to the regional level. A number of policy documents indicate some E-learning in education, but general policy in this field is not observed. In addition, policy documents contain many contradictions regarding usage of mobile technology and social networks in education. For example, in some program documents indicate that in the modernization of the education system educators should use new forms of learning and communication, including online network forms of interaction with students; others speak about responsibility of schools for the student network activity and that schools should limit their access to Internet and social media.

Middle and High school students interview

The aim of the interview was to find out how modern teenagers use mobile phones and social networks while at school, how they switch between online and offline activities, and if there any resources associated with education in the social networks. In total, 15 semi-structured interviews were conducted. The interviews confirmed the data obtained in the previous survey. Students say that they use mobile phones while at school almost all the time, usually when they experience emotional or psychological state as boredom (when the subject is not interesting, when there is a lecture material, and when they are not required to participate). At the same time adolescents go online to find educational information too; sometimes this kind of task is given by teachers. Many students noted that they are glad to add their teachers as “friends” in social networks and often turn to them with questions or get a feedback. Teens also claimed that usually there are younger teachers in social networks. In social networks teenagers find all needed learning materials, even to prepare for state exams, but none of these resources are established by representatives of the education system. Social network sites also contain opportunities for cheating and plagiarism, obsolete forms of knowledge testing

question-answer students solved quickly and easily.

Interview with school teachers

10 semi-structured interviews were taken between 2014 and 2015. The average age of participants is 35 years old; respondents are mostly teaching in public schools (90%). The questionnaire included 30 questions about teacher attitudes regarding usage of modern technology in education, such as BOYD (bring your own device); applying social networks in educational practices for communication with students; and organizing school projects on internet.

Responding to general interview questions, all respondents have stated that modern technologies are the indispensable part of the educational process. At the same time, on specific questions about how they personally use modern technologies and whether they consider them as useful, majority of respondents said that they do not know how to do it and find it useless. One of the identified barriers to the usage of mobile phones during the learning process for educators is a lack of understanding on what are the possible functions and services to use. We assume that it is due to the fact that teachers themselves do not use smart phones to access the web. According to interview data teachers face limitation of Internet access in schools and social network sites usually are blocked there. So they usually have to connect from home computers. In this case it is not clear how this work should be taken into account in their workload. The analysis of interviews shows that teachers also experience psychological difficulties in using of modern technology. Students use unknown/unclear terms for teachers – ‘emoticons’ (:), :(,), ‘likes’, and different tones for conversation (more informal). Teachers said that they do not know how to react to ‘this language’ used in the social network. There is a fear of saying something ‘wrong’ or to be misunderstood and recorded in the space of the social network.

Workshops and focus group discussions for teachers

Workshops and focus group were organized for the teachers team (collective) work for development of new practices for modern technologies such as m-learning and social network implementation into educational practice. One day training included 35 teachers who mostly teach in public schools (94%). The average age of participants is 37 years old. Communication during focus group discussions with teachers revealed that many of them do not have smartphones and social networks account.

Teachers were divided into 4 groups of 7-9 people and discussed where exactly there is a need for

communication with students in the educational process, and how it can be organized with the use of modern technologies. At the second stage, educators developed concrete tasks such as the usage of gadgets and social networks incorporation into the learning process. During discussions, educators were enthusiastic and showed interests in this subject; however, at the final part of the seminar, the analysis of answers on the question about their readiness to use some of the tools developed in the workshop in everyday practices shows their extra willingness to communicate with students outside the classroom; and unavailability to spend extra time on additional preparation as well as their fear of doing something “wrong” on social networks.

6 CONCLUSIONS

It is too early to make final conclusions. It is necessary to complete the planned research, but the preliminary data shows that usage of mobile technology is the indistinguishable process for adolescents due to face-to-face and online communication, which happen simultaneously. Penetration of the online communication in everyday lives of school children is ignored by the compulsory education, and the educational potential of social networks is not considered. The study identified a new — third wave of education informatization, which is coming not from the state as the previous two waves — the '80s and 1990s, but provoked by users — students as owners of the mobile devices.

7 STAGE OF THE RESEARCH

At this stage of the research quantitative and qualitative data obtained. On the first stage of the project the meta-analysis of foreign studies (publications in English) on the use of social networks in teaching practice was prepared, state documents analysis was done and high school student survey (Stratified random sampling, N=3194 respondents, men (45.2%) and women (54.8%), 16-18 years old students) were completed. It is still necessary to conduct principals’ survey in public schools.

The series of semi structured interviews of adolescents and teachers have been conducted (10 teachers and 15 adolescents), workshops and focus group discussions for teachers were organized (35

respondents who are mostly teaching in public schools). It is necessary to increase the number of respondents for both groups as well as to conduct public schools principals interview and schools teachers survey in 2016.

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APPENDIX

Table 1: Ways to use social media in education.

Category	Number of observations
Social network	
Facebook	9
StudiVZ	1
Twitter	3
Blog	1
Using service	
Group	6
Newsline	2
User wall	2
Page	3
Forms of use of social networks	
Aggregation data, images and information (8)	
Previous lessons materials publishing	2
Additional learning materials publishing (by teacher)	3
Additional learning materials publishing (by students)	3
Classified ads (1)	
Extracurricular activities information publishing	1
The platform for the interaction (14)	
Teacher-student interaction (the opportunity to ask a question)	5
Peer interaction (student discussion)	3
Peer interaction (Students' Project activities)	4
Student – community interaction	2
Learning management space (4)	
School assignments publication	1
Student research and class assignment publication	3

Table 2: Positive and negative aspects of using social networks in education.

Category	Number of observations
Technical features of social network use for education	
The positive aspects	
The positive aspects	12
Free access	5
Technical simplicity of use (for students)	2
Convenient aggregating of data and information	1
A wide range of services	4
The negative aspects	
Absence of access to social networks from classroom	
	3
Pedagogical features of social network use for education	
The positive aspects	
Lifelong learning (for students)	
	4
Completing school assignments at any convenient time (for students)	
	3
Easy feedback (for teacher and students)	
	2
New forms of work (for teacher and students)	
	2
Involving Parents in the Education	
	1
Creative thinking development	
	2
Self-education (using aggregate resources for students)	
	4
Engagement increase (for students)	
	3
The negative aspects	
Teachers low ICT competence	
	4
Psychological features of social network use for education	
The positive aspects	
Consolidation of the class	
	1
Destruction of hierarchical forms of interaction (the appearance of horizontal communication)	
	2
Social integration	
	1
The negative aspects	
Distractions when studying (for students)	
	3
Management features of social network use for education	
The positive aspects	
Students high interest in sites	
	3
Absence of necessity for training in the use of social network (for students)	
	1
The negative aspects	
Teacher time and resources investment (higher workload of teachers)	
	2

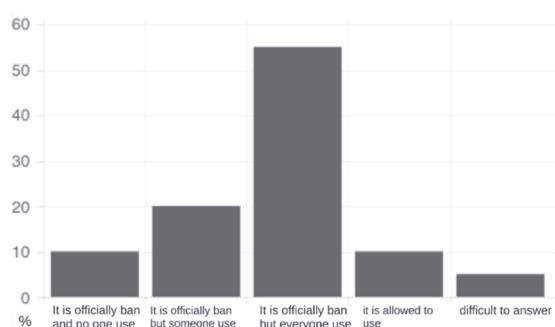


Figure 1: Possibility to use personal mobile device during class (N = 3194)%.

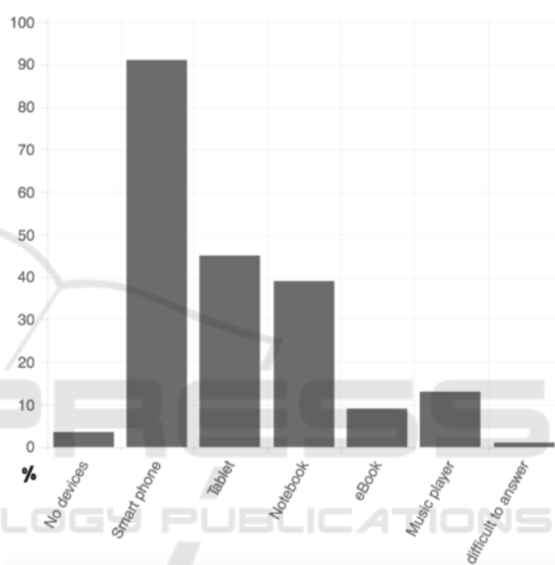


Figure 2: Availability and types of student's personal mobile devices (N = 3194) %.