

Always Online: Mobile Technology and Social Media Usage by Modern Teenagers at Home and at School

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Abstract. Students of Moscow schools and other educational institutions between the ages of 16 and 18 years old were surveyed to assess how Russian schools use modern methods of e-learning, mobile technologies, and social media in the learning process. The sample covered 3,194 respondents. The study describes three waves of Russian school informatization and the challenges the system has been facing over the last five years: the extensive use of mobile phones and PDAs with high-speed access to the Internet by students and the active use of social media services for

communication, search, and the storage of information. The article demonstrates the obvious progress of the schooling system: present-day teachers communicate with their students via email and social networks and occasionally give homework assignments to be done online or using Internet services. Yet, the school remains an extremely conservative institution. The education system is insensitive to the rapid development of technologies, and the process of modernization is essentially inhibited by sticking to conventional teaching practices and ignoring innovative ones.

Keywords: school, innovation in education, social media, teenagers, e-learning, informatization of education, ICT, digital technologies.

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According to an OECD report, Russia is ranked 5th among 29 countries in the overall level of innovation in school education [OECD, 2014]. The list of nine innovations in Russian school education includes, among other things, encouraging a more active use of computers as a source of information in the learning process and providing access to the Internet in class. The OECD data does not reflect the existing situation; instead, it focuses on the progress the education system made in 1999–2011. This suggests that the government's programs for computerizing and later informatizing school education, which were launched in the mid-1980s, have achieved their goals at least in part. Meanwhile, computer and Internet services have made much progress over the last five years. Education has been witnessing such trends as using PDAs, mobile apps, social media, and other types of e-learning. The efficiency of using these innovative practic-

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es is discussed online, in innovative teacher communities¹ and research articles [Boyd, 2014, Stockwell et al., 2015; Newhouse, Cooper, Pagram, 2015]. Such educational technologies are also new to the West, where it has been adopted only occasionally and not on a massive scale.

There are virtually no published studies analyzing e-learning practices in Russian schools, except for describing isolated cases. This research was aimed to see from the perspective of students how state-of-the-art technologies are being accepted by the modern school and applied by teachers.

1. Three Waves of Russian School Informatization

The first wave of mass computerization in educational institutions dates back to the 1980s. Federal reforms equipped schools with basic computers. This was later undertaken at a regional level. Including informatics in the learning process was a key component of the 1984 education reform. It only took one year to elaborate the curriculum and retrain teachers of the new subject; student and teacher guides were promptly developed, too. The Ministry of Enlightenment arranged regular advanced teacher training courses, and teacher-training universities established departments of programming and computational mathematics. Lessons in informatics were introduced in general education schools on 1 September 1985. The curriculum was rather narrow, designed not to develop computer-using skills, but to teach programming language and algorithms.

The second wave of informatization began in the 1990s. The authors of the report entitled *Information Technology as a Means of School Transformation* stress that informatization is not just equipping schools with computers, but providing convenient resources for learning in the first place [Froumin, Avdeeva, Vasilyev, 2005]. The authors also contend that the immediate objective of informatization is to achieve specific educational outcomes:

- development of IT literacy in a broad sense;
- development of certain skills and key competencies, such as the interactive use of existing operating tools and working in teams;
- transit from absorbing information to producing knowledge;
- creative application of knowledge in practice.

In her *25 Years of Russian School Informatization*, Marina Tsvetkova describes the progress made by the Russian education system

¹ Facebook page for eLearningIndustry (171,000 users): <https://www.facebook.com/eLearningIndustry>; forum on Pedsovet.org entitled Blended Learning: <http://pedsovet.org/forum/topic11274.html>; Facebook group entitled Innovators of Education (2500 users): <https://www.facebook.com/groups/edinovators/?fref=ts>

as a transfer from computerization to creating a unified information learning environment [Tsvetkova, 2010]. The goals of informatization evolved along with the development of hardware. At the very beginning, informatization was mostly aimed at computerizing schools, especially rural ones, and there was on average 1 computer for every 70 students in the country [Boldov et al., 2002]. However, it was only in 2010 that the modern student working place was described as having one computer for each student (model 1:1) [Asmolov, Semenov, Uvarov, 2010]. The main federal informatization programs—the Education System Informatization Project sponsored by the World Bank, stages I and II of the Federal Education Development Dedicated Program², the Education National Priority Project³, the Federal Dedicated Program “Development of a Unified Information Learning Environment for 2011–2005”,⁴ and the Federal Dedicated Program “Development of Informatization in Russia for the Period up to 2010”—were completed by 2010. Several large-scale school informatization-related projects have been implemented over the last five years (2010–2015), such as the introduction of electronic student notebooks⁵ and electronic textbooks⁶, but no integrated initiatives have been introduced so far. The top priorities of informatization are determined today at the regional level, meaning that programs differ depending on the regional policies.

Meanwhile, computer and Internet technologies are developing rapidly, with 2010–2015 witnessing a major progress in access to the Internet, information transmission rates, accessibility of the Internet, and the range of Internet devices.

The third wave of informatization, which consisted of the appearance of student PDAs in the school environment, was not initiated by the state but instigated by mobile device users, i. e. students themselves. The most significant changes to the modern school IT land-

² Resolution of the Government of the Russian Federation No. 803 “On the Federal Education Development Dedicated Program for 2006–2010” from 23 December 2005.

³ Education National Priority Project. Official website of the Presidential Council for Implementation of National Priority Projects and Demographic Policy: http://www.rost.ru/projects/education/education_main.shtml

⁴ Resolution of the Government of the Russian Federation No. 630 “On the Federal Dedicated Program “Development of a Unified Information Learning Environment (2001–2005)” from 28 August 2001.

⁵ Letter of the Ministry of Education and Science of the Russian Federation No. АБ-147/07 “On Methodical Recommendations for Introduction of Electronic Gradebook Keeping Systems” from 15 February 2012. Letter of the Ministry of Education and Science of the Russian Federation No. АК-3358/08 “On Adjustments to the Methodical Recommendations for Introduction of Electronic Gradebook Keeping Systems” from 21 October 2014.

⁶ Proceedings of the working meeting between the managers of the Ministry of Education and Science of the Russian Federation and major Russian publishing houses: <http://минобрнауки.рф/с/новости/4298>

scape include, firstly, the mass distribution of smartphones—understood as mobile phones featuring PC functions⁷—meaning that students often have more advanced devices than those offered by schools, and, secondly, the active use by students of online resources from mobile or desktop devices, particularly social media, for communication, search, and storage of information [EU Kids Online, 2009; Tsymbalenko, 2013; Pew Internet Research Center, 2015].

At this stage of informatization, Russian schools faced a number of challenges and changes they were not prepared for: the outdated computer fleet formed during the second wave on the one hand and PDAs in every student's pocket on the other hand. This is typical not only of the Russian education system, as the extensive use of mobile technology by students can be found in all developed countries. A different question is how schools and the system as a whole respond to these changes.

2. Information Technology and Innovation in Education

The world has been seeing more and more educational innovations that take into account the increasing use of the Internet and mobile devices by modern school students. For instance, the BYOD (Bring your own device) policy suggests that students use their own gadgets in the class to find information, watch videos, etc. It has been empirically proven that BYOD has a positive effect on student motivation, creating a supportive learning environment and thus improving education outcomes [Rau, Gao, Wu, 2008; Hwang, Chang, 2011]. Researchers from Singapore University also believe that mobile technology in the classroom helps students enrich their experience significantly and apply their knowledge in practice [Menkhoff, Bengtsson, 2012]. By using PDAs, school students learn to manage their out-of-class learning more efficiently and obtain necessary information in digestible formats (from video resources, articles, chats, etc.), which is particularly important for students with learning disabilities [Ibid.]. UNESCO Policy Guidelines for Mobile Learning say, "In a world that is increasingly reliant on connectivity and access to information, mobile devices are not a passing fad. As mobile technologies continue to grow in power and functionality, their utility as educational tools is likely to expand and, with it, their centrality to formal as well as informal education" [UNESCO, 2013]. Naturally, BYOD has its limitations, in particular those related to the problem of equal access: the proportion of middle and high school students who do not have mo-

⁷ According to the Teenager Research Unlimited (TRU) international research conducted by the TNS research group, 90% of Russian teenagers aged between 12 and 19 have their own mobile devices to access the Internet. The research in Russia represents 12–19-aged teenagers living in cities with a population over 100,000. The data was gathered from 1,500 online interviews and a 40-minute questionnaire.

mobile devices is pretty small, but still not zero in most developed and developing countries.

Another example of using modern technologies in the learning process is the flipped classroom format, which reverses instructional and homework elements of the traditional educational arrangement. Students study theory (lectures) at home using online resources, often in form of multimedia, thereby devoting in-class time to dealing with practical tasks. Researchers identify the following advantages of this method:

- the opportunity to catch up for students who missed one or more lessons (detailed description videos as a special kind of lectures have an absolute advantage over textbooks);
- more time for teacher-student interaction and teamwork in the classroom;
- the possibility to refer back to previously covered material or source files, e. g. when preparing for a test or exam [Estes, Ingram, Liu, 2014].

The authors believe that the flipped classroom strategy allows students to better absorb theoretical and practical knowledge and engage in the learning process more actively, which improves their education outcomes.

In many developed countries, the new stage of informatization began with the acceptance of e-learning, which includes distance, mobile, and virtual learning, and represents a major trend in the innovative development of education.

The UNESCO website borrows the definition of e-learning⁸ from several sources. In simple terms, e-learning comprises learning activities carried out with the use of Internet technologies. It is not only about using desktop computers at school, but also about mobile learning (m-learning), web-based training (WBT), working with e-materials independently using one's own PC, portable PC devices, and other products. In terms of problem solving, e-learning is an opportunity to receive advice and grades remotely; a possibility of interacting remotely with teachers or other users doing a common task, including with the help of communities (social media); and a source of self-education.

Therefore, e-learning is about creating a specific environment that differs from conventional in-class learning in the very methods of learning and serves to attain new educational outcomes.

⁸ UNESCO (2015) E-learning: <http://www.unesco.org/new/en/unesco/themes/icts/e-learning/>

E-learning considerably expands the range of tools applied, going far beyond school desk computers. Teachers have not yet familiarized themselves enough with the existing computer equipment, let alone the latest educational technologies that imply thinking at the level of using Internet services available on various types of devices. This problem is not a unique feature of Russian schools. Although most European schools are equipped with state-of-the-art hardware and connected to the Internet, digital technologies are exploited very sporadically in the learning process and their use depends largely on the teacher and school administrators, according to the European Commission report *Benchmarking Access, Use and Attitudes to Technology in Europe's Schools* [European Commission, 2013]. The OECD survey shows that the introduction of ICT in educational institutions is lagging behind the technologies used by school and university students at home. The fact that most students who have access to school computers use ICT very little at school is most probably explained by the incomplete integration of modern technologies in teaching [OECD, 2012]. According to PISA, the correlation between academic performance and using a PC at home is stronger than that between academic performance and using a PC at school [OECD, 2009].

The reluctance of teachers to use modern technologies in their everyday teaching practices can be explained by a number of factors, such as the existing “digital gap” between teachers and students and the lack of motivation for using innovative methods. Yet, a key role is played by the lack of a single integrated e-learning policy pursued by the education system as such.

In the National Education Technology Plan, the U. S. Department of Education recommends applying services used in everyday life and at work to the learning process in order to enhance the quality of education [United States Department of Education, 2010]. The recommendations mostly concern using social media, notably Facebook. South Korea's SMART Education Strategy implies using e-learning tools to do over 50% of school homework assignments. Korean schools engage actively in modern education programs, such as blended learning, m-learning, etc. [Hwang, Yang, Kim, 2010]. According to the data of PISA-2009, Korean 15-year-olds topped the digital literacy ranking⁹. Under the conception developed by the European Commission, teacher training in ICT involves not only training teachers to use school computers so as to organize the learning process or develop courses and educational software, but also teaching them the basics of e-learning. Thus, teachers should be able to learn new software quickly, assess the prospects

⁹ Participation in the additional PISA-2009 IT literacy survey was optional. Russia participated in the PISA-2009 reading literacy test.

of its usage, and manage independent and distance learning, etc. [European Commission, 2013].

The present-day Russian education policy in e-learning is full of contradictions. The Ministry of Education and Science of the Russian Federation issued an order on applying e-learning by educational institutions in 2014¹⁰. The recommendations include content filtering by Internet service providers. Not just computer games and social media are banned, but other resources as well¹¹. As a rule, websites are blocked for all computers in an institution, i. e. for both students and educators. Meanwhile, it is a widespread practice for schools to have a social media profile of their own; the ministry and many education departments even have two or more accounts in different networks¹². More and more teaching practices suggest that teachers use social media to communicate with students, evaluate assignments, and supervise projects [Koroleva, 2015; Klimenko, 2012; Feshchenko, 2011]. However, if a teacher is unable to access social media from a work computer, they will have to use their home PCs or personal mobile devices. The procedure for calculating the teaching load remains unclear in this case. As for students, most of them have their own mobile devices with access to the Internet, so they do not need to use school computers. Access restrictions for students devolve into hurdles for teachers working with online services.

Every school principal and teacher searches for their own solutions in this situation, which means that the introduction of innovation depends on the personal attitudes of teachers or principals. While some teachers try to adopt the BYOD strategy, others collect mobile devices at the beginning of each lesson. This means that the technology that saturates the modern school environment remains unexploited. Western schools are adapting to the extensive use of mobile devices by students and trying to use the potential of technologies for educational purposes, while Russian schools are missing out on this opportunity.

This empirical study seeks to assess how Russian schools use modern e-learning technologies through the eyes of students. From the wide variety of e-learning tools, we focus on using mobile technology and social media in education.

¹⁰ Order No. 2 of the Ministry of Education and Science of the Russian Federation “On Approving the Procedure for Applying E-Learning and Remote Teaching Technologies in Education Programs by Educational Institutions” from 9 January 2014.

¹¹ Federal Law No. 436-ФЗ “On Protecting Children from Information Affecting Their Health and Development” from 29 December 2010.

¹² Moscow Department of Education: <https://www.facebook.com/obrazovaniya.department>

4. How Modern Teenagers Use Mobile Technology and Social Media at Home and at School

The research was conducted as part of the panel longitudinal project “Monitoring Educational and Labor Trajectories” in 2014¹³. The data was gathered by surveying 16–18-year-old school students in Moscow. The sample covered 3,194 respondents: 1,444 boys (45.2%) and 1,750 girls (54.8%). Stratified random sampling by administrative districts in Moscow was used to ensure representativity. The questionnaire consisted of sets of questions about using e-learning tools in the classroom, when doing homework, and in self-education.

4.1 Research design

The questionnaire was designed to find answers to the two main questions.

1. How teenagers use modern digital technologies in everyday life:
 - availability and types of personal devices to access the Internet;
 - incidence of using gadgets at home and at school;
 - using Internet services for communication.
2. How modern digital technologies are used in the classroom, for homework assignments, individual studies, etc:
 - using school desk computers (problems solved with their help);
 - school policy regarding the use of mobile devices (rules and restrictions);
 - making use of personal mobile devices in lessons;
 - using Internet services for student-teacher communication;
 - doing homework online or using the Internet.

4.2. Survey results

At the moment of the survey, 2,491 respondents (77.9%) were high school students, 637 (19.9%) were obtaining a secondary vocational education, and 34 (1.1%) were university students. All respondents had lived and studied in Moscow: most (64%) since birth, 15% for over 11 years, 8% for 6 to 10 years, and 8% for less than 6 years.

4.2.1. Use of modern digital technologies by teenagers in everyday life

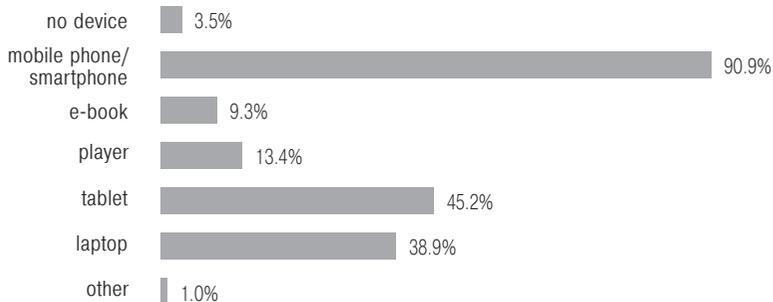
Only 3.5% of respondents gave a negative answer to the question “Do you have mobile devices or gadgets that allow you to access the Internet using a wireless or cellular connection outside your home?” Most students named mobile phones (91%), and the next most popular answers were tablets (45%), laptops (39%), and other devices. Students were allowed to choose multiples answers from the list, and most of them (74%) named two types of devices (Fig. 1).

While at home, 50% of young people keep using their mobile devices or other personal gadgets to access the Internet, 25% of teenagers use desktop as well as mobile devices equally, and 22% of respondents prefer using desktop PCs.

Vkontakte is the most popular social network among teenagers, being named by 91% of respondents, and followed by Instagram (50%) and Facebook (28.5%). Only 3% of students do not have any

¹³ The project has been implemented since 2009 by the Center for Cultural Sociology and Anthropology of Education at HSE’s Institute of Education.

Figure 1. Availability of mobile devices or gadgets allowing teenagers to access the Internet using a wireless or cellular connection outside their homes (N = 3,194)



social media account. 86% of respondents regard their Vkontakte accounts as primary accounts for communication¹⁴, with 73% reporting to have one account in the network and 23% claiming to have two or more. Most students signed up at the age of 12 and became active users within 2 years on average (at age 14). About one third of the surveyed teenagers (33%) are friends with their parents in social media, while 28% say their parents have no social network accounts. 25% of respondents are not friends with their parents even though the latter are also on Vkontakte. A small proportion of students (6%) do not know whether their parents have social media accounts, the majority of such students being boys.

Most respondents (70%) answered positively to the question whether they used mobile phones or other gadgets in the classroom to find learning-related information (except when asked to do so by teachers). 25% of respondents gave a negative answer, and less than 5% found it difficult to answer the question.

The same 70% of respondents use mobile phones or other devices in the classroom for non-learning related purposes (e.g. to play games, surf social networks, listen to music, etc.). 28% of them chose the option “Yes, I do, but only in some classes/courses”, 8% opted for “Yes, I do so in almost all classes/courses”, and 34% answered “Yes, I do, but very rarely.” “No, I never do that” was chosen by 27% of students (Fig. 2).

Only 10% of respondents reported that their schools allowed students to use gadgets in the classroom. Using mobile devices in the learning process is banned for most students (85%). Also, 55% believe that “this is forbidden, but some still do it”, 20% answered that

4.2.2. Using modern digital technologies in the classroom and in independent studies

¹⁴ “The account that contains the maximum of personal information about you, the one you use for messaging, etc.”

Figure 2. **Using mobile phones and other gadgets in the classroom for non-learning related purposes** ($N = 3,194$)

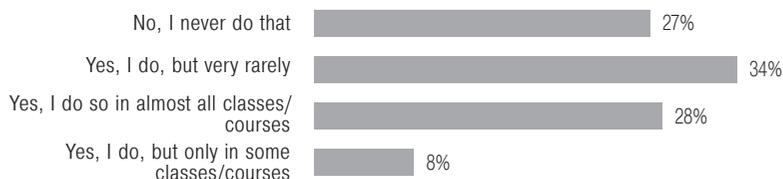
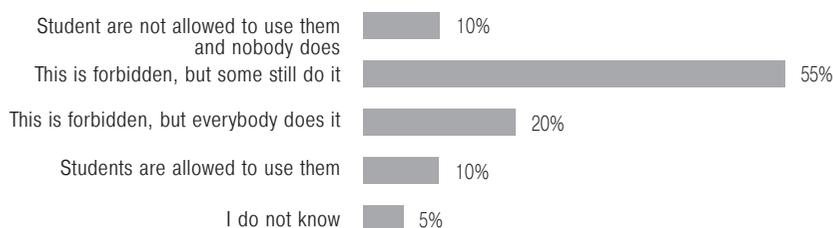


Figure 3. **Overall possibility of using personal mobile devices or gadgets in the classroom** ($N = 3,194$)



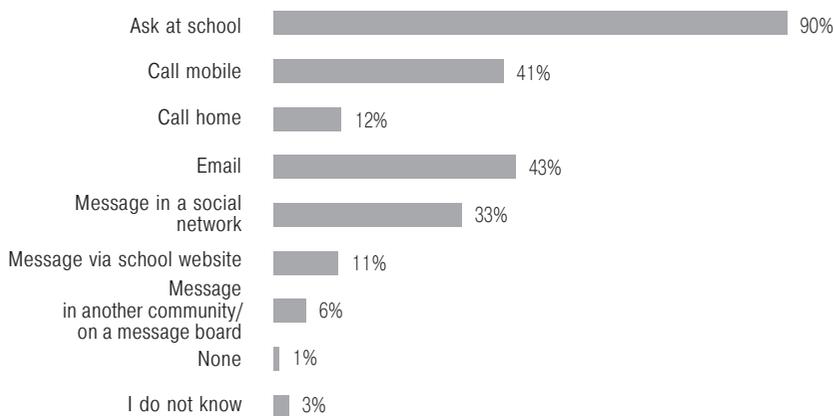
“this is forbidden, but everybody does it”, and 10% said that students were not allowed to use their own devices in the classroom and everybody followed the rule (Fig. 3).

Concerning the use of personal mobile devices in the classroom for learning-related purposes, the answers were distributed as follows: most students (44%) said they were rarely given tasks implying the use of their own gadgets in the lesson, 27% said they were never given such tasks, and 18% said they used their own devices to help teachers find information quickly.

No differences in the frequency of using gadgets for entertainment or learning purposes were found between students of different types of educational institutions (general education school, specialized general education school, gymnasium, lyceum, etc.), except for cadets who use their mobile devices more often for entertainment than for searching for learning-related information. The only group we managed to identify in the total sample based on the gadget using parameters includes students taking part in academic competitions, who demonstrate a lower incidence of using mobile phones or other gadgets in the classroom. Boys tend to use gadgets for entertainment slightly more often than girls.

An analysis of the relationship between academic performance and the incidence of using gadgets in the lesson without teacher permission produced no statistically significant correlations, regardless of whether devices were used for entertainment or for learning-related purposes.

Figure 4. Means of teenager-teacher out-of-class communication
(N = 3,194)



More than half of the respondents (56%) reported that computers and other devices (laptops, tablets, etc.) could only be accessed in informatics classes to solve relevant problems. 16% of respondents believe that hardware is accessible in many classes but only to perform assignments given by the teacher. 4% (201 students) reported to have no computer equipment at school (mostly in the Cadet Corps).

Access restrictions on school computers and other devices were reported by most teenagers: 44% pointed to restrictions on using social media, 35% on playing online games, and 33% on accessing other Internet resources. 14% of respondents stated that they had no such restrictions at school and thus could browse any websites. A tangible proportion of students (11.4%, or 365 respondents) chose the option “I do not know”.

The question “What are ways to ask most of your teachers questions out of class?” produced the following distribution of answers: the most popular answer was “Ask at school” (90%), followed by “Email” (43%), then “Call mobile” (41%), “Message in a social network” (33%), with minor options being “Call home”, “Message via school website”, “Message in another community/on a message board”, and “None” (1%) (Fig. 4).

The questionnaire also asked students whether their teachers had social media accounts, whether students added their teachers as friends, and whether they were ready to show their personal pages and information to teachers. 45% of teenagers answered “Yes, some teachers have social media accounts and I am friends with some of them.” 27% chose the answer “Yes, some teachers have social media accounts, but I never add them as friends or accept their friend requests.” 10% of students believe that “most of my teachers have no social media accounts.” 18% of respondents answered “I do not know if any of my teachers has a social media account.” 6% of teenagers

confirmed “Yes, they do, and I am friends with some of them on my other account.” Participants of academic competitions also stand out here, adding their teachers as friends much more often.

Answers to the question “Do you use social media to search for learning-related information?” were distributed as follows: “Yes, often” (44%), “Yes, but not often” (37%), “No, never” (17%), and “I do not know” (2%). Homework assignments are performed online or using the Internet “about once per week” by 21% of respondents, “two or three times per week” by 17%, “about once per month” by 16%, “never or almost never” by 14%, and “less often than once per month” by 13%, with 7% of students finding it difficult to answer the question.

4.3 Findings

Our research demonstrates that the majority of Moscow teenagers are totally mobile and autonomous in using electronic devices. They have their own gadgets to access the Internet and prefer using mobile devices even with a PC at home. This may simply be due to convenience and unwillingness to switch between devices or to the pursuit of independence, self-sufficiency, and avoiding parental control. By the age of 12–14, students start using social media actively for communication and learning, with the most popular network being Vkontakte. Respondents report that they use social networks not only for communication and entertainment, but also for finding and working with educational content. Despite an ubiquitous banning of mobile phones in educational institutions, young people continue to use their portable devices. The questionnaire used in the survey did not ask students about the punishment for using gadgets at school, monitoring strategies used by teachers, or ways of getting around those bans. Meanwhile, the survey shows that over half of teenagers use mobile phones in lessons to surf social media, listen to music, etc. However, the same proportion of students said that they used personal mobile devices in the classroom to access educational content. Teenagers participating in academic competitions use mobile phones and other gadgets in the classroom less often. Perhaps the reason is the higher motivation for learning and involvement in the learning process of students preparing for subject-specific competitions. The academic performance of school students is not affected by the incidence of using mobile devices in classes without teacher permission, whether for entertainment or learning-related purposes.

What are schools offering students in this situation? School computers can only be accessed in informatics classes and only to perform relevant tasks. The possibility of accessing the Internet from school computers is restricted. Homework assignments to be done online or using Internet resources are a rare thing. Meanwhile, emailing and social media are some of the ways to contact teachers out of class. Slightly less than half of teenagers said that their teachers had social media accounts and that they were friends with them. Despite the ban on using personal mobile devices in lessons, there are

situations when it is the teachers who ask students to use personal gadgets, but this is more rare. These findings are virtually the same across different types of educational institutions and are thus characteristic of the education system as a whole.

Modern teenagers represent the Net generation: the Internet, mobile devices, and social media are their habitat of comfort. The present-day market of mobile devices, with its diverse selection and relatively low prices, allows almost every student to have a personal gadget. Teenagers report using mobile devices not only for entertainment and communication, but also for learning purposes. Today, the average class of school students is a community of advanced Internet users who are perennially online and switch easily among studies, communication, and entertainment. How is the system responding? Schools artificially create an alien environment for students by denying them opportunities to use mobile technology. School computers are inaccessible for students; computer use is subject to a number of restrictions, in turn making them useless. The survey results show that teenagers continue using their own mobile devices even at home, so it is unlikely that they have much interest for school computers, which are often outdated. At the same time, access restrictions become obstacles for innovative teachers who exploit social media to communicate with their students and try to involve and motivate them by allowing the use of mobile gadgets in the classroom. Yet, the system has also made some progress. Modern teachers communicate with students by email and via social networks, and occasionally give homework assignments to be completed online or using Internet services.

We can thus see a lot of controversy in the attitude of the education system towards using modern electronic technologies. The system survived the first and second waves of computerization, overcoming the resistance of teachers and administrators. However, it has not yet developed a tactic for the new wave of informatization, which has been initiated not by the state, but by students in the context of vast distribution of mobile technology. Conflicting decisions are often taken at different levels, and there is still no consensus about or reasonable regulations for using mobile and Internet technologies in school. These contradictions greatly inhibit the development of e-learning, which has become the new stage of education informatization in most developed countries.

5. Conclusion

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