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The Use of Modern Electronic Gadgets in the Educational Process of the University

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Abstract

Recently, humanity has become a prisoner of electronic technology. Regardless of gender, age, level of education, ethnicity, economic status, modern people actively use gadgets in their life, having quick access to any information, being constantly in touch with their friends, relatives, colleagues, regardless of their location. It is no surprise that, at present, modern electronic technologies have become firmly embedded in education. With the development of the functionality of mobile devices, an increasing number of students cannot imagine their study at the university without gadgets.

This article presents data from the results of a sociological study that reveal the degree of importance of the use of gadgets in the educational process for students. It reveals the advantages and disadvantages of electronic media used in the educational activity.

Keywords: electronic gadgets, higher education institution, Internet, digital technologies, information, educational process, smartphone, students, innovations, electronic information educational environment.

1. Introduction

The modern world is inconceivable without electronic gadgets; they are various small devices whose functions improve and simplify a person's life, make it more pleasant and comfortable. A feature of these devices is their small size, making them easily portable in your pocket, fitted in your wrist, your finger, or connected to a computer or smartphone.

In the modern era of digital devices, the activity of using gadgets in all spheres of human activity is increasing rapidly. The emergence of new technologies in the global arena contributes to the introduction of new technologies in the educational environment (Goloviashkina, 2018).

Possession of modern information technologies and means of communication is a prerequisite for the implementation of educational activities, even in universities.

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Dean Hamer, BrainPop project manager, said that “It is important to understand and realize the significance of the fact that children have gadgets in their hands. Children have the opportunity to learn, wherever they are”. This quote applies not only to children. Many teachers have a negative attitude toward the use of smartphones by students during lectures. However, this phenomenon can be channeled in a different direction and used in the educational process. There are a huge variety of Android and Apple-based applications, which help solve a lot of problems. But the majority of students, as well as teachers, are not aware thereof. Proper use of mobile applications during the lecture allows you to address challenges and direct students' attention to the object being studied (Orlov, 2016).

The use of gadgets by students in the educational process not only opens up great opportunities for the acquisition, transfer, and preservation of knowledge but also has its negative consequences.

Let us turn to the main opportunities the gadgets offer in the educational process. These include the following:

- easy and quick access to information;
- visualization of educational information of a different nature (virtual and natural objects of study);
- a programmed solution of information retrieval and computational problems;
- the possibility of communication with the teacher at the right time and in several different ways;
- simplification of monitoring performance for the teacher and student;
- prompt access to relevant educational materials;
- archival storage of significant amounts of textual and graphical information (Goloviashkina, 2018).

Let us appeal to history in order to understand what kind of disadvantages the gadgets introduce into the educational process. At the end of the XX century, the learning process in higher educational institutions was structured as follows: a student, a teacher, and a teaching tool. The teaching tool at that time was a paper textbook, available either from the library fund of an educational institution or bought, a notebook for lecture notes and a blackboard, which was used to explain the material under study.

Together with the XXI century, mankind entered the information age – the era of computers and the development of electronic devices, digital and telecommunication technologies. Training has been digitalized. Electronic textbooks, e-books, an electronic library, and electronic educational resources have appeared.

“Computers and computer networks actually assumed the function of information storages with additional service capabilities, up to contextual and semantically organized search. At the same time, they “removed” students from traditional data instruments – from the “craft” component of the process of education and self-education using elementary tools of labor – hands, ballpoint pens, and paper: lecture and textbook noting, structuring and reproducing material based on what they heard completely transformed into electronic format.

For example, a lecture can be available in either paper or electronic form, a language exercise can be performed by inserting the missing letters, historical events can be arranged in the correct order by touching a button on the screen, etc. Are there too many powers to the technologies, excluding our own active participation? Is saving the time and physical resources always justified when it comes to the process of memorizing, processing information, developing the skill of applying the knowledge acquired? What kind of work should be entrusted to technical training tools, and what – to a person? This discussion question requires separate consideration. Unfortunately, the “copypaste” technology does not insert information directly into the brain. Just as before, photocopying, which has already become customary, did not do this. While the usual rewriting made us reflex and “pass” information through ourselves (Pankratova, Znatnov, 2018).

The twenty-first century is certainly the century of information technology. To keep up with the times, we are starting to use more and more new, improved technologies; new ample opportunities occur to freely transmit, receive, and accumulate information, as well as instant access to the knowledge gained and to any information.

Currently, the range of gadgets is expanding very rapidly. The emergence of new achievements of science and high technology causes hype, and some time after its presentation,

this gadget seems to us like something ordinary and routine. This is how quickly gadgets fit into our lives and push out our usual pencils, pens, notebooks, printed books, and textbooks.

2. Discussion

The use of modern electronic gadgets by students of higher educational institutions in the educational process is considered in many works by Russian and foreign researchers.

M.Iu. Orlov (2016) cites the problems of providing access to data and applications from mobile devices, as well as the use of information technology in the process of teaching students. M.A. Goloviashkina (2018) in her works considers the main advantages of using gadgets at different stages of students' educational activities and also pays special attention to the negative manifestations of their use during classes. Using mobile devices to organize distance learning, V.K. Kukhareenko (2011), V.A. Kuklev (2009) in their studies analyze the conditions for the implementation of the process of mobile learning in the system of open distance education. I.N. Golitsyna and N.L. Polovnikova (2011) consider the electronic information educational environment as a pedagogical reality. Such authors as S.Iu. Znatnov (2018) and A.V. Kudriavtsev (2016) consider the main directions for using mobile learning in modern education. They note that, despite the widespread availability of mobile phones among students, mobile learning is not common in domestic universities. It is concluded that the majority of modern students are technically and psychologically ready to use mobile technologies in education and it is necessary to consider new opportunities for more efficient use of the potential of mobile learning. A.V. Kudriavtsev (2016) considers mobile devices as one of the means of information and communication technologies in education. Thus, the problem of organizing mobile education in modern society is highly important today.

3. Materials and methods

The empirical base of the study was the results of a sociological study conducted by the authors in September 2018 on the basis of the Federal State Budgetary Educational Institution of Higher Education of the Russian State Social University. The authors interviewed students of the faculty of management of the FSBEI HE Russian State Social University.

The objective of this study is to identify and evaluate the role of the practice of using modern electronic gadgets by students of higher educational institutions in the educational process, their advantages, and disadvantages.

According to a specially designed questionnaire, 100 undergraduate 1st-4th-year students, faculty of management of the Russian State Social University were surveyed, 26 of which were boys and 74 – girls aged 18–22 years (average age – 20 ± 2).

The questionnaire included such questions as whether it is possible to use electronic gadgets in the educational environment of the university, which gadget is most effective for use in the educational process of the university, how often you use the gadget, for what purposes you most often use your gadget during your studies, whether your academic performance depends on using gadgets.

The results of the study were analyzed by analyzing the relationship between the age of students and their gender stereotypes.

Gender stereotypes are understood to mean standardized ideas about behaviors and character traits, corresponding to the concepts of “male” and “female”. Gender stereotypes are opinions about personality traits and behavioral patterns of men and women (Bern, 2001).

4. Results

At different ages, students' attitudes towards using electronic gadgets differ according to gender stereotypes:

- from 18 to 19 years, boys are more likely to use electronic gadgets in the educational process than girls;
- from 19 to 21, there are almost no differences;
- from 21 to 22 years, girls are more likely to use electronic gadgets in the educational process.

Analysis of the results of a sociological survey of students showed that almost all participants (98 %) were in favor of using gadgets in the educational process, that their mobile devices are a valuable helper in achieving educational goals.

Almost every student (95 %) pointed out that a mobile phone is the most effective electronic gadget that can be used in the educational process. 2 % of students prefer using a laptop as a modern device in the course of training. In turn, only 1 % of the respondents preferred the tablet.

The overwhelming majority of respondents (98 %) indicated that they often use an electronic gadget in the educational process and only 2 % of the students do not use it in their studies at all.

Students' answers to the question about the purposes of using gadgets during studies showed that a relatively small proportion of respondents prefer to print lectures using gadgets (12 %), every third respondent (31 %) uses an electronic textbook to study instead of a paper one. 47 % of the surveyed students answered that they often use gadgets during classes in order to quickly find an answer to a certain question or as a cheat sheet.

The fact that 8 % of the students surveyed admit that they use gadgets to communicate in social networks, directly during the classes gives rise to concern. Only 2 % of the students surveyed do not use electronic devices at the university.

The authors used the calculation method for the Pearson chi-square test (Table 1).

Table 1. Analysis of contingency tables using the chi-square test

Factorial feature	Effective feature		Total
	Yes	No	
Use gadgets in the educational process	98	2	100
Phone as the most efficient gadget	95	5	100
Use gadgets to record lectures	12	88	100
Use gadgets to read textbooks	31	69	100
Use gadgets to search for cheat sheets	47	53	100
Use gadgets to communicate in social networks	8	92	100
Often use gadgets	96	4	100
Laptop as a more efficient gadget	2	98	100
Tablet as a more efficient gadget	1	99	100
Total	390	510	900

The number of degrees of freedom is 8. The value of the chi-square test is 583.493. The critical value of the chi-square test at a significance level $p = 0.01$ is 20.09. The relationship between factorial and productive features is statistically significant at a significance level $p < 0.01$.

The reasons for the use of gadgets in the educational process of students of the faculty of management of RSSU are presented in Tables 2, 3, 4, 5.

Table 2. Analysis of the reasons for the use of electronic gadgets in the educational process by the girls of the faculty of management of RSSU (in age 18–20 years, in %)

№	Reasons for the use of electronic gadgets in the educational process (Factorial feature)	Effective feature	
		Yes	No
1	Speed of obtaining information	86	14
2	The simplicity of doing e-learning page	64	36
3	Ease of use and accessibility	58	42
4	Minimizing possible errors during job execution	38	62
5	Ability to store large amounts of data	73	27

The calculation method for Pearson criterion χ^2 was used in the analysis.

Analysis of conjugacy tables using the Chi-square test showed. The number of degrees of freedom is 4. The value of the criterion χ^2 is 55.283. The critical value of χ^2 at significance level $p = 0.01$ is 13.277. The relationship between factorial and resultant features is statistically significant at a significance level of $p < 0.01$. Significance level $p < 0.001$.

Table 3. Analysis of the reasons for the use of electronic gadgets in the educational process by the girls of the faculty of management of RSSU (in age 21–22 years, in %)

№	Reasons for the use of electronic gadgets in the educational process (Factorial feature)	Effective feature	
		Yes	Yes
1	Speed of obtaining information	76	24
2	The simplicity of doing e-learning page	56	44
3	Ease of use and accessibility	60	40
4	Minimizing possible errors during job execution	42	58
5	Ability to store large amounts of data	68	32

The calculation method for Pearson criterion χ^2 was used in the analysis.

Analysis of conjugacy tables using the Chi-square test showed. The number of degrees of freedom is 4. The value of the criterion χ^2 is 27.560. The critical value of χ^2 at significance level $p = 0.01$ is 13.277. The relationship between factorial and resultant features is statistically significant at a significance level of $p < 0.01$. Significance level $p < 0.001$.

Analysis of the reasons for the use of gadgets by girls (Tables 2, 3) shows that the great importance for them is the speed of obtaining data and the ability to store a large array of data, most likely this is due to the psychological differences between the sexes and the influence of the rapidly changing world.

Table 4. Analysis of the reasons for the use of electronic gadgets in the educational process by young men of the faculty of management of RSSU (in age 18–20 years, in %)

№	Reasons for the use of electronic gadgets in the educational process (Factorial feature)	Effective feature	
		Yes	Yes
1	Speed of obtaining information	78	22
2	The simplicity of doing e-learning page	52	48
3	Ease of use and accessibility	66	34
4	Minimizing possible errors during job execution	76	24
5	Ability to store large amounts of data	73	27

The calculation method for Pearson criterion χ^2 was used in the analysis. Analysis of conjugacy tables using the Chi-square test showed. The number of degrees of freedom is 4. The value of the criterion χ^2 is 20.757. The critical value of χ^2 at significance level $p=0.01$ is 13.277. The relationship between factorial and resultant features is statistically significant at a significance level of $p < 0.01$. Significance level $p < 0.001$.

Table 5. Analysis of the reasons for the use of electronic gadgets in the educational process by young men of the faculty of management of RSSU (in age 21–22 years, in %)

№	Reasons for the use of electronic gadgets in the educational process (Factorial feature)	Effective feature	
		Yes	Yes
1	Speed of obtaining information	82	18
2	The simplicity of doing e-learning page	64	36
3	Ease of use and accessibility	46	54
4	Minimizing possible errors during job execution	86	14
5	Ability to store large amounts of data	75	25

The calculation method for Pearson criterion χ^2 was used in the analysis.

Analysis of conjugacy tables using the Chi-square test showed. The number of degrees of freedom is 4. The value of the criterion χ^2 is 49.874. The critical value of χ^2 at significance level $p = 0.01$ is 13.277. The relationship between factorial and resultant features is statistically significant at a significance level of $p < 0.01$. Significance level $p < 0.001$.

Analysis of causes shows (Tables 4, 5) the importance of rapidly obtaining data and minimize the possible errors boys of the faculty of management. Gadgets open up great opportunities for students, providing an opportunity to quickly and accurately calculate mathematical formulas and various dependencies, as well as to minimize possible errors in the educational process.

As we can see from the above data, there is a certain problem in the use of modern electronic gadgets by students of higher educational institutions in the educational process, in particular, their use for the intended purpose.

5. Discussion

The production technology of electronic gadgets is rapidly developing and has become engrained in the life of students. Mobile wireless devices are used as a means of mobile learning.

“Mobile learning gives a new quality to learning, most fully reflects the trends in the education of a modern person, providing constant access to information at any time; it is a new toolkit in the formation of a person of the information society, where a new learning environment, independent of place and time, forms (Kuklev, 2009).

Actual trends and patterns of development of the educational industry predetermine the use of various gadgets (Rogach, 2017). It should be noted that the use of mobile devices solves problems such as:

- Provides quick access to training and reference resources of local networks and the Internet. Teachers and students can get the necessary reference information at any time without the use of additional devices. Often, during the lecture, the teacher must not only answer the students' questions, but also demonstrate the answers that may contain photo, video, and audio data. Students during practical and laboratory work can get access to background information necessary to do tasks. Mobile devices provide Internet access, independent of the local network, local servers, and gateways.

- Organizes real-time interaction of teachers with students. A large audience keeps most students off asking a question and immediately get an answer. Mobile systems equipped with a special application able to ask a question and get a short, unambiguous answer in real time, will improve the feedback in the educational process.

- Provides an opportunity to demonstrate lecture material. Today, not all classes are equipped with modern means for demonstrating educational material: projectors with a connected computer, monitors, interactive whiteboards. Mobile devices allow demonstrating lecture material, transferring data directly to the phones of students or on the screen of the projector or TV. In the latter case, the teacher does not need to carry a laptop or request the administration of the educational institution to provide a computer.

–Provides an opportunity to study everywhere, and in some cases, at any time regardless of the classes. The solution to this problem will significantly improve the efficiency of distance learning.

Thus, the use of gadgets allows you to easily and quickly find the necessary information, save time, develop and progress, fix a certain moment, and organize fast and convenient communication. However, mobile learning can be complicated by such circumstances as:

- lack of technical equipment with the required set of functions;
- low methodological skills of teachers for the introduction of mobile devices in the educational process;
- the incompleteness of mobile resources and programs in various areas of educational activities;
- Small size and low resolution of the screen.

Despite the fact that the use of electronic gadgets simplifies the acquisition of knowledge by university students, and makes their life more comfortable, there are some negative consequences:

1. Escape from reality. Young people in the modern world have internal diffidence, lots of fears and anxieties that literally wrap and force them to escape from reality with the help of electronic gadgets. Constant viewing of social networks, watching videos or listening to music helps them drown out their inner voice and creates the illusion of well-being;

2. Addiction. Most users of electronic gadgets become addicted. They waste their time on social networks, e-mail, news feeds, posting their photos and monitoring “likes” they have collected, and comments. The timing shows hours a day aimlessly wasted due to gadgets.

Moreover, a growing number of students and schoolchildren using gadgets during the educational process for other purposes, in particular, playing, chatting, watching entertaining video and audio resources;

3. Life in the virtual world. Nowadays, electronic gadgets and the Internet has made most of the communication virtual. Communication with friends takes place via Skype and chatting - in the free instant messaging systems such as Viber or WhatsApp. Blogging on YouTube, or pages on social networks: Instagram, Vkontakte, Facebook, etc. Live communication is dying out, giving way to a virtual one.

4. Race for novelties. The developers of electronic gadgets get huge profits, as a result of the release of more and more new, more advanced and functional models. Especially young people are prone to this psychosis, chasing after new gadgets, which cost quite a lot of money and depreciate fairly quickly, as a result of the release of new, more advanced models.

5. Personal degradation. Waste of time on daily “likes” of photos and comments to them on social networks, useless games, correspondence with friends “about nothing”. All these actions on the Internet using a gadget do not develop logic, enrich intelligence but rather promote personal degradation.

Undoubtedly, gadgets have a profound impact on the lives of university students. Is this influence good or bad? It depends on the purpose they are used for. It is necessary now to decide whether they will contribute to the development or degradation of young people. University teachers shall play a certain role in this matter.

The concept of universality is set in the system of basic general education and includes the formation of universal learning activities for students (hereinafter referred to as ULA). ULAs are, in a broad sense, “learning ability”, i.e. the ability of the individual to self-development and self-improvement through the conscious and active acquisition of new social experience, and not only the development of specific subject knowledge and skills within individual school subjects (Asmolov, 2017).

Based on this definition, the universality of educational actions means their inter- and over-disciplinary nature, ensuring the integrity of development, continuity of all levels of education, and underlying any type of students’ activity (Znatnov et. al., 2018). Throughout the history of social development, the institute of education has been the main instrument for educating the younger generation, the most significant factor in the development of human potential. The essence of this function is to transfer to the younger generation through the institution of education cultural values, interpreted in the broadest sense: scientific knowledge, achievements in literature and art,

norms of behavior and moral values, knowledge, and skills inherent in various types of professional activity (Rogach, 2018).

The teacher builds the environment and is the "center of crystallization" of the educational process. The actual result depends on the activity of the student and can be obtained after the completion of the course (Kukharensko, 2011).

American psychiatrist Dale Archer believes that nomophobia, or the syndrome of permanently being online, can be soon included in the official list of mental disorders (Morozova, 2016). A fuss over smartphones or their absence only confirms these concerns. People can be addicted to everything, even to gadgets. Our generation, more tech-savvy, experiences "high tech hunger" – a constant need for new technologies that will facilitate our lives. It should be noted that more and more areas appear where the use of telephones is prohibited. Signs appear in some cafes asking not to use a mobile phone when staying there: "No free wi-fi", "No cell phone use", but that's all (Schwenk, 2015). This is because the generally accepted rules of courtesy simply lose their meaning when we start talking or chatting with someone during a friendly, personal, or business meeting. We don't want to listen, it's easier for us to hide behind an invisible wall.

The above examples prove that gadgets and the like have become an integral part of the daily practice of a modern person. All this is like a social campaign. The problem of the influence of gadgets is relevant around the world. And Russia is not an exception (Morozova, 2016).

"It is worth pointing out that, despite the active use of gadgets in the learning process, some students consider them as good assistants and ultimately improve their results, while for others they perform the role of "disservice" and negatively affect their learning outcomes. It is interesting to understand why some do a quantum leap in their learning efficiency, and others only degrade and make poor progress in the curriculum" (Protopopova, Makarenko, 2017).

6. Conclusion

Summing up, it is worth noting that "modern gadgets play an important role both in the field of communication at different levels and in the process of education at the university, as shown by the results of the study.

They help students acquire new information, record lectures, prepare for classes, and use mobile learning applications that positively affect the quality of their learning. Mobile technology, however, has both positive and negative effects on the learning process (communication in social networks during lectures and cheating during the tests and examines). Nevertheless, considering the results of the student survey and our own experience, we decided that the assessment of the identified advantages and disadvantages of using gadgets in the educational process suggests that they have a greater positive effect on the educational process and the development of modern youth" (Goloviashkina, 2018).

Given the above, it becomes obvious that the use of modern electronic gadgets by students in the educational process of higher educational institutions is relevant and promising. Thus, in modern conditions of active development of information technologies, higher educational institutions need to create an information and communication environment (Vetrova et. al., 2019).

The growing diversity of gadgets offers great opportunities for students. It should be noted that the use of electronic gadgets in the educational process allows students to significantly save their time to study the material, and also increases the online supervision efficiency of teachers.

At the same time, a higher educational institution can assume the provision of students with information to their electronic gadgets from a registered account; the university will be able to post schedules, tasks for students, and connect students to a scientific library.

The results of the study showed that students of the faculty of management of the Russian state social University often use gadgets in the educational process, and often it is the phone as the most popular and effective gadget. The main reason for the use of the gadget is the use of the gadget as a search for the necessary information to answer the lesson, but for recording lecture material or reading a textbook phone as a gadget is practically not used, because it is quite complex in this field of application. Use gadgets in the educational process, both girls and boys, and the reasons for their use are almost the same age and gender.

The use of modern electronic gadgets by students of higher educational institutions in the educational process is a positive or negative experience can not be said unequivocally. However,

it is necessary to build a process of teaching students subject to new opportunities of the age of information technology.

The learning process must be built subject to new opportunities, in order to ensure the innovative development of the education sector based on the challenges of modern society and, therefore, it is necessary to introduce the practice of applying modern electronic gadgets to students in the educational process of higher educational institutions.

In order to achieve a high quality standard of higher education, a prerequisite is the introduction of electronic gadgets into the educational process, which allow students to form competences in accordance with set standards, modern views on life in the context of universal accessibility of information, understanding of information technologies as an integral part of everyday life.

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