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Necessity to Research Risks of Education Digitalization for Successful Training of Future Teachers

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Abstract

The relevance of the research resulting from the widespread introduction information space and computer technology into the educational process, which, along with indisputable advantages, is accompanied by risks, the least studied in terms of prediction. Due to the fact that by 2025, according to the project "Modern Digital Educational Environment in the Russian Federation", a digital educational space should be created, the aim of this research is to study the digital competence of future teachers and the attitude of parents to the implementation of this trend. During the research were used methods of surveys and interview: 258 first-year students (future teachers) and 365 parents of elementary school pupils were interviewed. The article substantiates necessity to study the behavior of the children using devices and gadgets, which should be taken into account designing the educational process of future teachers, as both teachers and students must have a reliable and objective notion about a degree of children immersion in the information space, digitalization risks and the degree of compliance of information and communication skills of pupils and future teachers by the time of their meeting at school. The article presents data on the degree of immersion in the Internet space of future teachers, children who have begun systematic training in rural and urban schools, as well as their parents. The article reflects the attitude of parents to online learning and the control of their children' behavior in the Internet space. The results of the research can be used by teachers and researchers to design and monitor the digitalization of the educational process.

Key words: teacher training, digitalization of education, educational process.

Introduction

Relevance of the research

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Nowadays reality is the primitive using of the information space that is typical for the majority of participants in the educational process: for information retrieval, network communications and entertainment. A significant part of teachers, being "digital migrants", are already experiencing difficulties in working with the generation of "digital aborigines" and "digital generation" (Prensky, 2001). Until now, the problem in training teachers for the conditions of social and educational digitalization remains the features of thinking, attention, and communication of Z – generation children, described in the scientific works of many researchers (Johnson, 2010; Melikova, 2015; Verbitskiy, 2016; Danby, Fleer, Davidson, & Hatzigianni, 2018) are not fully reflected in the technologies and methods of school education. Features of the educational process organization in the digital space are also not reflected in the content of academic disciplines of higher educational institutions which are training school teachers and psychologists. Cognitive and personal changes also do not find their reflection and understanding, do not investigate properly and do not consider in the construction of the educational process at school and universities. So, researches concerning the phenomena of multitasking, features of clip thinking, problems preventing Facebook depression, nomophobia, addictions and addictive behavior, changes in communications are only evaluative and not tracked in monitoring studies (Sokolova, 2015). At the same time, only an understanding of the direction of development identified on the basis of monitoring studies of the situation can lead to risk prediction and should be taken into account during organization of the educational process for future teachers.

The current state of the problem according to the literature

According to the Russian (Soldatova, Rasskazova, & Nestik, 2017) and foreign (Danby, Fleer, Davidson, & Hatzigianni, 2018) authors over the past 5 years, the number of children with a high level of Internet activity has increased more than twice: 32% of children spend about a 1/3 of the day online (Soldatova & Rasskazova, 2016). Modern children for the first time enter the virtual space at 3-4 years old, some of them (Melikova, 2015) are taking their first steps in the network at 1,5 years old. Future graduates of pedagogical specialties, who are studying today at the 1st course, will meet exactly this generation of children (Generation Z).

It should be noted that their meeting will coincide with the completion of the program "Modern digital educational environment in the Russian Federation", which should lead to the creation of a digital educational space, accessibility and mass online learning involving up to 6 million students and 10 000 teachers and tutors. It is believed that in 5 years the role of the school teacher should change radically: he or she must become a guide in the world of digital information, must have the skills to use digital technology, programming, communication, information analysis, building individual educational routes (Nikulina & Starichenko, 2018).

It should be noted that the education informatization is accompanied by numerous risks of a different nature including methodological, technological, personal (Manahova, 2012). However, among the risks of the project, questions about the possible lack of competence of teachers and the negative attitude of the parents to the implementation of this trend are practically not considered. However, today the education system already has a problem situation; neither a psychological-pedagogical theory nor an educational practice is ready for a scientifically grounded way out of which (Verbitskiy, 2016). In many ways, this problem is due to the "digital divide" of generations (according to the concept of Hove and Strauss, 2007). In the modern school (Soldatova & Shlyapnikov, 2015), representatives of 4 generations interact with each other: the last soviet (15 % of teachers), generation X (74 %); digital generation У (young teachers – 11 %)

and generation Z - it is students (perhaps they will come to school as teachers or tutors in 5-15 years). It should be noted that according to surveys in schools (Soldatova, Rasskazova, & Nestik, 2017) the majority of teachers and students (95%) are Internet users, over the last 5 years, the time spent in the network and the percentage of users has doubled. Research authors (Soldatova & Shlyapnikov, 2015) note the illusiveness of the digital competence of children, as well as the low competence of parents. However, we should understand that in order to educate children in 5 years, teachers must fully possess digital competence, and parents must fully control the child's network.

Today, the concept of digital competence includes the willingness and ability of a person to apply communication technologies confidently, efficiently, critically and safely in various spheres of life (information environment, communications, consumption, techno sphere) on the basis of mastering relevant competencies, as a system of knowledge, skills, responsibility and motivation (Neborskiy, 2015).

Materials and Methods

Methods of research

In the research were used theoretical and diagnostic methods. As theoretical methods were used analysis, synthesis; generalization; as diagnostic methods were used questioning and survey. The results of the questioning and survey were analyzed using the methods of mathematical statistics.

Experimental base of research

The survey of students at the 1st and 2nd courses in the direction of "Pedagogical Education" was held in "Vyatka State University" (Kirov, Russia). The survey of parents of elementary school pupils was conducted based on secondary schools and gymnasiums from the regional center and districts of the Kirov region.

Stages of research

The study was conducted in four stages. At the first stage, theoretical analysis of the problem according to the literature and analysis of diagnostic techniques and methods for identifying problems and risks of digitalization were carried out. At the second stage, selected questions for the survey based on the modification of the questionnaire "Screening diagnosis of computer dependence" (Yurieva & Bolbot, 2006). For parents, a questionnaire was compiled from 15 questions aimed at studying the child's behavior on the Internet (including duration of using, goals, level of using gadgets, possible dependency formation), as well as parental attitudes towards digitalization of the educational process and the ability to control whether the child is online now and in the future.

At the third stage, 258 students and parents of 365 primary school pupils from urban and rural schools in the city and districts were surveyed.

At the fourth stage, the analysis and interpretation of the results were performed.

Results of the research

Students survey results

A survey showed that 54,6% of 1st and 2nd year students in the direction of "Pedagogical Education" are online more than 5 hours a day, at the same time, every fifth spends more than 50% of time communicating on social networks and instant messengers. At the same time, regardless of gender and place of residence, 19% of respondents use the Internet mainly for watching movies and listening to music, for self-education – 16,5%, others combine entertainment with communications in the social network. Also, the survey showed that 45,46% of boys and 88,74% of girls stayed on the network longer than

planned, and 28.17% of them do it all the time. At the same time, respondents noted that being online often distracts them from household duties (15,38% of boys and 40,85% of girls), have a negative influence on education (15,38% of boys and 47,88% of girls), takes time away from sleep (23,08% of boys and 59,15% of girls). It should be noted that on the question about the substitution of activities to the network communications, 36,8% of girls answered "always".

It should be noted that, judging by the data from the questionnaires, girls have a network attachment and anxiety more pronounced: in 33,11% of cases they have a serious impact of the Internet on their lives (12,5% cases with boys), and in a few cases (1,03%) – dependence with a high probability.

It is gratifying to note that only 7,69% of boys and 15,49% of girls prefer real communication to online, while 38,58% of boys and 47,07% of girls prefer the opposite. We believe that this feature of future teachers has a positive effect on the development of their professional communicative competences, acquiring constructive skills of interpersonal communication.

Parents survey results

Survey results showed that regardless of where children live (city or countryside) most children (76,7% и 74,1% accordingly) used smart devices to stay online. Children who are denied access to the Internet because of the age in the city less than in rural areas (5,6% against 10,3%). Figure 1 shows that the majority of children 7-8 years old are on the Internet 1-2 hours a day, while 15,68% of rural children are online for more than 3 hours, which is 2 times more than children from cities (6,7%).
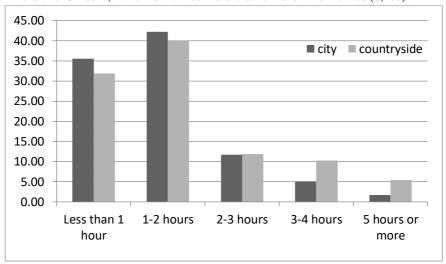

Fig. 1. Percentage of children living in the city and in the countryside, using smart devices with Internet access with different duration per day

Most kids use gadgets to entertain and search for information. As shown in Figure 2, the Internet used for games (1); communications (2); preparing homework (3); listening to music (4) and internet surfing (5). Moreover, every fourth parent (28,3% of urban residents and 24,9% of rural residents) believe that their children gain new knowledge and skills.
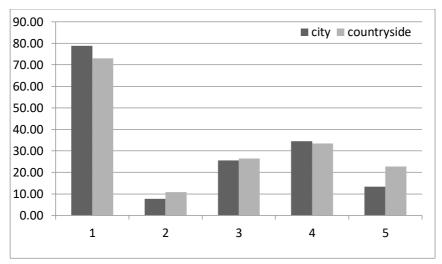
Fig. 2. Activities of pupils using the Internet resources

Most parents (76,7% of urban residents and 68,7% of rural residents) believe that playing sports and creative work reduce the time children spend on the Internet, however, 7,2% and 17,3%, accordingly, believe that the child will still find time to stay in the network. According to respondents, the use of gadgets occurs to the detriment of other activities: 15,0% and 18,9% pupils from cities and countryside are online to the detriment of preparing for lessons, 5,6% and 18,9% - home duties, 5,6% and 13,0% - walking, 18,3% and 18,9% - reading.

Parents note that children are trying to combine several activities, one of which is to be online: multitasking phenomenon occurs sometimes of 25% of urban and 47,6% of rural children, and in 3,9% and 14,6% of cases - often, what worries and annoys parents. Control the time the child is online 44.4% of urban residents and 67,0% of rural residents; however, 11,7 % - 18,9% of parents believe that the child can control himself or herself. To the restrict of using smart devices 38,9% of urban and 32,4% rural children react calmly, 42,2% and 50,3% accordingly – are exasperated. Every tenth child responds to the exit from the network with a very emotional indignation, which may indicate the formation of a smart addiction.

According to the survey, now 14,4% of urban children and 17,8% of rural children, and soon 22,2% and 64,3% accordingly would be better guided on the Internet than their parents. At the same time, adult citizens and rural residents use digital space mainly to solve work and household problems. (80,6% and 69,2% accordingly), to communicate (58,3% and 73,0%), to play games (7,2% and 24,3%) and to gain knowledge (22,2% and 11,4%). In general, it is shown that in the city, parents more often use network resources to acquire knowledge and solve their needs, controlling their time on the Internet and child.

The study of the parents' opinion on the education digitalization showed that only 26,5% of the respondents consider it possible when a child will gain knowledge online, as it will be useful in the future. At the same time, mainly parents of rural children consider that learning via the Internet is more interesting (30,9% of rural residents against 8,3% of citizens) and it is the future (22,7% of rural residents against 1,7% of citizens). The majority of parents are confident that only direct communication with the teacher can help children gain knowledge and skills.

Discussions

Successful preparation of a future teacher requires an understanding of the state of society,

attitudes of children and their parents to various forms of learning in the digital educational space. Analysis of the scientific literature on the research problem (Ignatova, 2017; Kalimullina & Trocenko, 2018) has shown that currently there is practically no information which could be used to predict the risks of digitization in the educational sphere. Most of the work comes down to the description of problems, ascertains their presence, gives an assessment, but does not consider the problem in development.

Our study of behavior in the Internet space of people involved in the educational environment according to their role and having a difference in age of about 10 years: children (7-8 years old), students (17-18 years old), parents (28-32 years old) did not reveal categorical differences of their behavior in the Internet.

Comparison of our data with previously published by other authors (Pecherskaya & Merkulova, 2013; Soldatova & Rasskazova, 2016; Verbitskiy, 2016) shows that significant changes over the past 5 years has not happened. There is still a difference in the spatial-temporal configuration of using the Internet by children and their parents. As 3-5 years ago pronounced digital divide appears in the absence of "leading" in the digital competence of parents, which does not allow them to control using of digital technology. According to our data, this difference is more pronounced among rural residents.

We have shown that representatives of the Z-generation have signs of a smart-dependence, which are already forming by the beginning of school. Studies (Alwagait, Shahzad, & Alim, 2015; Shen & Kuo, 2015; Smith, Hewitt, & Skrbiš, 2015; Stornaiuolo, 2017) which were conducted among students also showed that the use of Internet space in learning, along with the expansion of the information field, contributes to the demotivation of the acquisition and using of basic knowledge, reduces the overall motivation to learn, contributes to the formation of dependence, which is compounded by the widespread use of portable (smart) devices. Obtained data raises the question of understanding and developing safe standards for the duration of work by students of different ages with gadgets, the age of first contact and the development of the Internet by a child. It should also be noted that modern sanitary norms and rules of organization of education are based on the idea of a traditional (non-digital) school. In this regard, future teachers may face the question - to immerse further or take the children out of the Internet?

We believe that the preparation of future teachers for work in the conditions of the educational space digitalization should be coupled with the development of methodological approaches and comprehensive studies in the field of pedagogy, age psychology, physiology, hygiene, and studying the "digital generation" children's characteristics. The results of the research should be the basis of the digitalization methodology of education, should be monitoring and prognostic in nature, quickly enough to be introduced into the educational process and raising the qualifications of teachers due to the high speed of technological changes in the IT industry

We believe that in order to solve this problem, future teachers of all levels of education should be involved in research activities. These studies should be systemic, monitoring and prognostic. In this case, they will allow for the timely adjustment of the process of future teachers training, to form with them comprehension about the features of their future pupils and their role in the safe using of the digital educational space.

Conclusion

Training future teachers is impossible without a comprehensive study on the problems of the educational space digitalization. Research should be monitored and prognostic in nature, their results should be considered in a timely manner when designing and correcting educational programs. Data about

the degree of immersion in the Internet space of future teachers, students of rural and urban schools, as well as their parents can be the basis for further monitoring studies, in which future teachers of all levels of education can be involved. This will allow having objective and reliable knowledge about the peculiarities of pupils and their parents in the digital educational space, and quickly introducing them into the educational process.

References

Alwagait, E., Shahzad, B., & Alim, S. (2015). Impact of social media usage on students' academic performance in Saudi Arabia. *Computers in Human Behavior, 51*(B), 1092-1097.

Danby, S. J., Fleer, M., Davidson, C., & Hatzigianni, M. (2018). *Digital Childhoods: Technologies and Children's Everyday Lives*. Singapore: Springer.

Hove, N., & Strauss, W. (2007). *Millennials go to college: strategies for a new generation on campus: recruiting and admissions, campus life, and the classroom* (2nd ed.). Great Falls, VA: LifeCourse Associates.

Ignatova, N. Yu. (2017). *Education in the digital age*. Nizhniy Tagil.

Johnson, G. M. (2010). Internet use and child development: Validation of the ecological techno-subsystem. *Journal of Educational Technology & Society*, *13*(1), 176-185.

Kalimullina, O. V., & Trocenko, I. V. (2018). Modern digital educational tools and digital competence: analysis of existing problems and trends. *Open education, 22*(3), 61–73.

Manahova, I. V. (2012). Risks of education informatization. *Regional Information Security, 2,* 47-51.

Melikova, N. D. (2015). The impact of the Internet on the psyche of children. *Universum: psychology and education*, *11*, 12-20.

Neborskiy, E. V. (2015). Education of the future: key pedagogical innovations and trends in the development of the educational environment. *Internet-zhurnal Naukovedeniye*, *2*(27), 1-10. http://dx.doi.org/10.15862/166PVN215

Nikulina, T. V., & Starichenko, E. B. (2018). Informatization and digitalization of education: concepts, technologies, management. *Pedagogicheskoye obrazovaniye v Rossii, 8*, 107-113.

Pecherskaya, E. P., & Merkulova, D. Yu. (2013). Preschoolers on the Internet. *Theory and practice of social development, 10*, 76-77.

Prensky, M. (2001). Digital Natives, Digital immigrants. *On the Horizon, 9*(5), 1-6.

Shen, C. W., & Kuo C. J. (2015). Learning in massive open online courses: Evidence from social media mining. *Computers in Human Behavior, 51*, 568-577.

Smith, J., Hewitt, B., & Skrbiš, Z. (2015). Digital socialization: young people' changing value orientations towards internet use between adolescence and early adulthood. *Information, Communication & Society, 18*(9), 1022-1038.

Sokolova, A. A. (2015). Analysis of the state of development of the problem of the risks of Internet space for the health of adolescents on the materials of foreign literature. *Obrazovaniye lichnosti, 3*, 42–47.

Soldatova, G. U., & Shlyapnikov, V. N. (2015). Digital competence of Russian teachers. *Psikhologicheskaya nauka i obrazovaniye*, *20*(4), 5-18. doi: 10.17759/pse.2015200401.

Soldatova, G. U., & Rasskazova, E. I. (2016). Digital competence models and online activities of Russian teenagers. *Natsional'nyy psikhologicheskiy zhurnal, 2*(22), 50-60. doi: 10.11621/npj.2016.0205

Soldatova, G. U., Rasskazova, E. I., & Nestik, T. A. (2017). *Digital generation of Russia: competence and security.* Moscow: Smysl.

Stornaiuolo, A. (2017). Contexts of Digital Socialization: Studying Adolescents' Interactions on Social Network Sites. *Human Development*, *60*(5), 233-238.

Verbitskiy, A. A. (2016). «Digital generation»: education problems. *Professional'noye obrazovaniy*e, *7*, 10-13.

Yurieva, L.N., & Bolbot, T. Yu. (2006). *Computer addiction: the formation, diagnosis, correction and prevention.* Dnepropetrovsk: Porogi.