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Problems and Prospects of Distance Learning in the Estimates Provided by Teachers and Schoolchildren's Parents

Galina V.
LEONIDOVA
Vologda Research Center of RAS
Vologda, Russian Federation, 56A, Gorky Street, 160014
E-mail: galinaleonidova@mail.ru
ORCID: 0000-0003-0361-2099; ResearcherID: I-7139-2016

Rim M.
VALIAKHMETOV
Bashkir State University
Ufa, Republic of Bashkortostan, Russian Federation, 3/4, Karl Marx Street, 450076
E-mail: rim_m_sifat@inbox.ru
ORCID: 0000-0002-8875-5197; ResearcherID: P-1733-2017

Guzel' R.
BAIMURZINA
Bashkir Branch of the Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences
Ufa, Republic of Bashkortostan, Russian Federation, 20/1, 50-letiya Oktyabrya Street, 450005
E-mail: guzrim@mail.ru
ORCID: 0000-0002-1844-2689; ResearcherID: G-4824-2017

Lyubov V.
BABICH
Vologda Research Center of RAS
Vologda, Russian Federation, 56A, Gorky Street, 160014
E-mail: lvbabich@vscc.ac.ru
ORCID: 0000-0003-1661-4245; ResearcherID: A-4415-2016

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Abstract. Appealing to the problem of distance learning at schools is caused by the urgent transfer of the educational process to a digital format against the background of the pandemic announced in March 2020 due to the spread of a new coronavirus infection (COVID-19) in the world. Almost all national education systems in developed countries have been converted to online format. Despite the available experience and a certain readiness of the educational sphere to use distance learning, such a comprehensive mass transition to the "remote mode" could not but cause a number of problems both for the teaching corps and for students and their parents. The purpose of the research is to analyze the first results of distance learning at school in conditions of self-isolation due to the need to contain the spread of coronavirus infection in the country. Information base of the research are online surveys of teachers of the Vologda Oblast and school students' parents of the Republic of Bashkortostan, conducted in April-May 2020 by the Vologda Research Center of the Russian Academy of Sciences and the Bashkir Branch of the Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences. The problems of distance learning are identified in a number of aspects: technical (lack of necessary equipment in households, quality of the Internet, reliability of educational platforms), organizational (lack of a unified methodology for online learning; increased workload for teachers; difficulties in conducting some creative and laboratory classes) and socio-cultural (reduced educational motivation of school children; high risks of children's health deterioration). The novelty of the research lies in a comprehensive assessment of the situation related to the processes of remote learning of a mass social group of schoolchildren in the context of a pandemic by two key actors of the education system – the teaching corps and parents, as well as in identifying the problems caused by the emergency transition to online learning. The practical significance of the study is in the formation of a knowledge base and grounds for making balanced and adequate management decisions both in the event of such emergency situations, and in the course of further implementation of the national development goals of the Russian Federation until 2030: digital transformation, achieving "digital maturity" of key sectors of the economy and social sphere, including education.

Key words: distance learning, online learning, comprehensive school, teacher, parents, schoolchildren, coronavirus infection, pandemic.

Introduction

Nowadays, digital technologies deeper penetrate into all spheres of social and economic life. The sphere of education is also included in the new technological (digital) revolution of global meaning. It [the revolution] "poses new challenges for education ... and provides digital technologies helping to solve it" [1, p. 13].

The issues of introducing digital technologies into the Russian education system were raised and resolved in several stages.

The beginning of the general process of school informatization was laid by the Decree of the Central Committee of the Communist Party of the USSR and the Council of Ministers of the USSR no. 271 "On measures to ensure computer literacy of students and the widespread introduction of electronic computing in the educational process", dated March 28, 1985. The above-mentioned task was carried out from the mid-80s to the end of the 90s of the 20th century[1]. A new subject "Basics of information and computer science" was introduced into the teaching practice of educational institutions. As the result of taken measures, "more than a quarter of educational organizations" were provided with equipped computer rooms [1, p. 13]. More ambitious tasks were being solved in the process of implementing the target integrated program "Informatization of national education"

[1] *Program of education informatization of the Russian Federation for the period of 1994–1995.* Moscow: Ministry of Education of the Russian Federation, 1993. 34 p.

(1994–1995) such as development and justification of the theory and methodology of education informatization, methods, and means of its practical application. The introduction of information technologies was considered a mechanism for ensuring comprehensive education and development of a person, preparing him or her for full-fledged activity within society informatization [2, p.57]. Since the late 90s of the 20th century, regional and local education informatization programs have been developed and implemented with the shift of responsibility for processes in the education system from the federal level to the regional one.

At the second stage (2000–2010), information and communication technologies began to be widely introduced into the educational process. In 2001, the federal target program "Development of a unified educational information environment"[2] addressed the problem of "creating conditions for a gradual transition to a new level of education based on information technologies". A number of schools equipped with personal computers by the end of the Program increased by more than 10 times [3, p. 17]. Further implementation of information technologies in the educational process was carried out within the National Priority Project "Education" (PNPE), adopted for the period of 2005–2010. It was implemented in accordance with a new educational ideology "aimed at development of a new society focused on the realization of the potential of a human personality" [4, p. 12]. Among 14 target areas, PNPO included school internetization, which was completed quite successfully. By the 2007/08 academic year, 74.3% of state and municipal full-time educational institutions had Internet connection as fast as 128 Kbit/s[3].

Promotion of IT in the practice of the educational sphere has become the main focus of the National Education Initiative "Our new school" (2010–2015) as part of a task of digital equipment of schools with multimedia devices and interactive whiteboards. By the 2013/14 academic year, when implementing the third stage of education informatization, the share of schools with Internet access increased to 95%[4]. The implementation of the program targets laid the foundation for the subsequent wider application of digital technologies in the educational process.

In 2017, speaking at the St. Petersburg International Economic Forum (SPIEF-2017), Russian President Vladimir Putin set the task of "multiplying the output of specialists in the field of digital economy", thereby defining the strategic goal of ensuring "universal digital literacy". To do this, he said, the education system should be "seriously improved at all levels – from schools to institutions of higher education"[5]. Already in 2018, in accordance with the decree of the President of the Russian Federation no. 204 "On national goals and strategic objectives of the Russian Federation through to 2024", dated May 7, 2018, the national program "Digital economy of the Russian Federation" was adopted. Its introduction indicated the beginning of the fourth stage of informatization of the educational sphere with the transition to

[2] On the federal target program "Development of a unified educational information environment (2001–2005)": Decree of the Government of the Russian Federation no. 630, dated August 28, 2001. *Garant*. Available at: https://base.garant.ru/1586371/ (accessed: August 3,2020).

[3] *Education in the Russian Federation: 2010: Stat. Coll.* M.: GU-VSHE, 2010. 492 p.

[4] *Education in the Russian Federation: 2014: Stat. Coll.* M.: NIU "Vysshaya shkola ekonomiki", 2014. 464 p.

[5] St Petersburg International Economic Forum plenary meeting. Available at: http://www.kremlin.ru/events/president/news/54667 (accessed: June 4, 2020).

its digitalization. This was facilitated by the national project "Education", which was adopted in 2019 among other 12 projects. The project's main objectives include ensuring the global competitiveness of Russian education, making Russia one of the top ten countries in the world in terms of comprehensive education quality, and forming a well-integrated and socially responsible personality[6]. Within these global challenges, a key problem remains acute – ensuring the educational process by means of new information technologies: the Internet, information and communication technologies, digital educational resources, etc.

The pandemic of a new coronavirus infection (COVID-19), announced by the World Health Organization in March 2020, has dramatically changed planned and progressive implementation of the national project. Nearly all national education systems in developed countries, as well as in Russia, were forced to switch to online form of education on short notice.

In an emergency, the Russian education system, in fact, conducted a massive test of reliability of existing digital technologies and readiness of educational institutions to work with it. The RF Ministry of Education issued a "Temporary order on support for the implementation of educational programs of primary general, basic general, secondary general education, educational programs of secondary vocational education and additional general educational programs using e-learning and distance educational technologies" (app. by order of the Ministry of Education of the Russian Federation no. 103, dated March 17, 2020). In accordance with the order, educational organizations of all levels switched to e-learning based on the usage of remote educational technologies in the educational process.

The accelerated transfer of educational processes to a distance format objectively caused a number of problems that affected teachers, students, and parents. There were a lot of discussions on problematic situations in the media.

When the Temporary order was introduced, no one knew how long we would have to live and work remotely. This period has not ended yet, but most students and schoolchildren went on summer vacation, and the education system was able to sum up some results. We shall also summarize it on the basis of empirical materials obtained from the surveys of representatives of the teaching community and schoolchildren's parents on primary results of implementing distance education in epidemiological conditions.

Distance learning: history, some approaches, and theories

Computer technologies emergence is associated with information [3] or communication[7] revolutions in society's development. Among the milestones, noted by researchers, we would like to highlight the invention of writing and the creation of postal communication, the emergence of printing with the ability to transmit knowledge in time and space; electricity and following innovations like a telegraph and development of international connections; the emergence of voice communication (telephone, television), which added speed and clarity to the process of transmitting information[8], and, finally, the Internet which rapidly penetrated all aspects of human life.

[6] The National project "Education". Available at: https://strategy24.ru/rf/projects/project/view?slug=natsionalnyy-proyekt-obrazovaniye&category=education (accessed: June 4, 2020).

[7] Len'kov R.V., et al. *Sociology of Youth: Textbook for Universities*. 2nd edition, revised and enlarged. M.: Yurait, 2020. 356 p. P. 187.

[8] *Ibidem*, p. 188.

Rapid development of technologies also led to the spread of information educational practices and distance education in particular [5]. The history of distance (at first called "correspondent") education is associated with Caleb Phillips, who recruited students to study shorthand "anywhere in the country by exchanging letters" in the 1720s [5], and Isaac Pitman, who sent letters with his lessons to everyone interested by mail in the mid-19th century. Ch. Toussaint and G. Langenscheidt trained students by means of mailing in their correspondence institute (Berlin, 1856). A few years later, first correspondence schools were established in the United States (Anna E. Ticknor, Isaac Pitman), where students were also taught by mail.

Today, certain elements of distance learning are present in the education systems of almost all countries of the world and increasingly attract researchers' attention, especially in the field of studying its specifics, laws of development, and determining methodological guidelines. Various theories and concepts were developed in the domestic and foreign scientific literature (B. Holmberg's theory of distance learning based on empathy; M. Moore's theory of transactional distance and student's autonomy [6]; and O. Peters's concept of industrialization [7], who justified the emergence of distance education as "the result of the influence of the industrialization process on various spheres of society" [8, p. 108], etc.). In the Russian scientific community, a model of distance learning was developed in the 1990s [9]; the model considers distance learning an information and educational environment with modern technical means of data acquisition[9].

B. Holmberg's theory of distance education is based on an "empathy approach" [10, p.37], in which "the ability to perceive the inner world of another person with the preservation of emotional and semantic shades, completely excluding the experience of one's own feelings" is important [11]. According to B. Holmberg, the implementation of this approach involves focusing on the concept of "guided educational conversation" [11, p. 43]. Despite the simulated nature of such a conversation, it is "embedded in the content" of educational (written, coursework) materials, through the study of which a person is "feeling personal relations ..., intellectual pleasure, (and) educational motivation" [12].

O. Peters (1994) considered educational communication in distance learning artificial. In his opinion, a teacher becomes more of a "manager of the educational process" in such conditions [13].

According to M. Moore, transactional distance is pedagogical but not geographical, which requires "special training organization and procedures, i.e., "structure" (individualization) and "dialogue" [14].

In L.S. Vygotsky's socio-cultural theory, it is stated that cognition development is based primarily on human interaction. Its main postulates are the ideas about higher mental functions, language development and speech functions, the zone of proximal development and auxiliary structures (guided assistance). All higher functions appear as actual relations between individuals[10]. Vygotsky's theory posits that learning potential is limited by the "zone of proximal development" (ZPD), i.e. the student's "cognitive readiness" area, and full and comprehensive development requires assistance and social interaction.

[9] For more information about the Russian scientists' experience of distance learning research see: Vardanyan N.A. *Development of distance learning in secondary schools: Dis. ... Cand. of Sci. (Pedagogics)*. Moscow: Institute of General Education of the Ministry of Education of the Russian Federation, 2004. 211 p.

[10] Vygotskiy L.S. *Pedagogical Psychology*. M.: Pedagogika-press, 1999. 536 p. P. 57.

The introduction of distance learning in Russia is officially related to the 2012 Federal Law no. 273-FZ "On education in the Russian Federation".

Insurance of the availability of distance education in Russian regions leads researchers to conclusions about increasing educational inequality in society and even, according to scientists from the Higher School of Economics, on the concept of "educational poverty", that is "a situation of restriction and/or complete deprivation of children of obtaining education and developing skills necessary for social life" [15, p.18]. Some approaches to the problem of educational opportunities equality are discussed in the works of A.R. Bessudnov, V.M. Malik [16], D.L. Konstantinovsky [17], I.D. Frumin [18], etc.

The spread of distance forms in education currently causes a growing interest in the study of the essence of distance education. Its interpretations by the domestic researchers include the following keywords: means, form, technology, organizational process, geographical distance, service, correspondence education[11][19].

Distance education is a part of a universal education digitalization, which is currently being implemented there and within the framework of the national project "Education" as well. The public (researchers, teachers, and parents) are concerned about the results of this process, which, on the one hand, gives wider access to educational and information resources and knowledge in general, and, on the other hand, threatens with many negative consequences. The greatest concern is caused by the process of turning a teacher into some kind of a "dispatcher turning the programs on", who is practically excluded from the educational process[12], and the deterioration of the quality of education, since digitalization a) provides only a standardized transfer of material [20] and b) cultivates the idea of the Internet as a source of absolute knowledge [21, p.21]. The problems of distance learning are also highly relevant in the context of "the expected launch of an experiment on the implementation of the target model of the digital educational environment (DEE) in a number of regions of the Russian Federation on September 1, 2020"[13]. However, in this study, the authors did not aim at considering dangers and challenges of education digitalization but tried to analyze the three-month experience of distance learning implemented in Russia and its regions through information and communication technologies as a response to the global and systemic challenge posed to the world by coronavirus infection.

The impetus for writing the article was the participation of the Vologda and Bashkir researchers in the discussion of demographic problems and family policy within the all-Russian expert webinar, held in May 2020 in the Public Chamber of the Russian Federation. The acuteness of the discussion of socio-cultural problems of Russian families in the current epidemiological conditions, and the unanimous response to the study of distance education problems prompted the decision of co-publishing.

Research methods and methodology

The study was based on the results of the sociological survey of the pedagogical

[11] Polat E.S., Bukharkina M.Yu., Moiseeva M.V., et al. *Theory and Practice of Distance Learning*. Moscow: Akademiya, 2004. 416 p.

[12] Klyachko T. Digitalization of education – hopes and risks. *Vesti obrazovaniya*. Available at: https://vogazeta.ru/articles/2018/2/26/blog/2148-tsifrovizatsiya_obrazovaniya_nadezhdy_i_riski (accessed: 30.07.2020).

[13] Trushin A. "To deschool the school". Distance learning is replacing classwork. *Kommersant*. Available at: https://www.kommersant.ru/doc/4397027 (accessed: July 28, 2020).

community of the Vologda Oblast conducted by the Vologda Research Center of the Russian Academy of Sciences in April–May 2020 through questionnaire online forms on the Google platform. The questionnaire was answered by 272 respondents (general sample – 8.6 thousand people[14]): 94% of them are women, and 6% are men; 55% live and work at Vologda schools; 30% – in Cherepovets; 15% – in district centers and rural settlements (the sample included the Vologda, Gryazovets, Veliky Ustyug, Nyuksenitsa, Kich-Gorodok, Harovsk, Babushkino, Vytegra, and Totma districts). 12% of all respondents have less than 3 years of a total work experience, 38% – from 3 to 20 years, 50% – more than 20 years; 74% work at regular comprehensive schools, 1% – at correctional schools and schools with inclusive education, 25% – in educational centers, lyceums, gymnasiums and schools with advanced study of subjects. The confidence interval of the sample was 5%.

The opinion of schoolchildren's parents is presented by the data of an online sociological survey in the Republic of Bashkortostan, conducted by the Bashkir Branch of the Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences in April 2020. 1.765 people took part in the survey. The sample has approximately the same distribution of schoolchildren's parents of different grades (8–10% each). For objective reasons the smallest share was made by the parents of 10–11 grades students: their combined share in the total sample size is 11.3%. 25% of the respondents are Ufa residents, 16% are the residents of other towns, 24% are the representatives of regional centers, and 35% are from rural settlements of the municipalities of the Republic. Women were more active in the online survey (91%). The respondents were divided approximately equally by their age: 54% were the parents aged under 39, 45% – aged from 40 to 59.

Results and its discussion

The pandemic announced by the World Health Organization in March 2020, associated with the spread of a new coronavirus infection (COVID-19), and subsequent quarantine measures, self-isolation, economic downturn, etc. significantly affected the mood of comprehensive school teachers (*Tab. 1*). Almost two-thirds of the respondents (65%) noted its deterioration.

Against the background of mood deterioration, the patience of the socio-professional group of teachers has significantly decreased compared to the responses of the region's residents as a whole. The majority of them (52%) said that they felt "tension and irritation". This is twice as much as among the population of the Vologda Oblast (27%)[15]. This difference of teachers' social mood is caused not only by the situation associated with the spread of a dangerous virus but also by mass transfer of schools to distance education. According to the research results, the majority of teachers (98%) say that the emergency switch of the educational process to a remote form was accompanied by various problems for the participants of educational relations (*Fig. 1*).

According to the online survey of school-children's parents in the Republic of Bash-kortostan, 71% of respondents had concerns about the transition of children to distance education during the period of self-isolation.

Force majeure circumstances of the transition to the remote education format affected, according to teachers' estimates, all

[14] According to Rosstat.

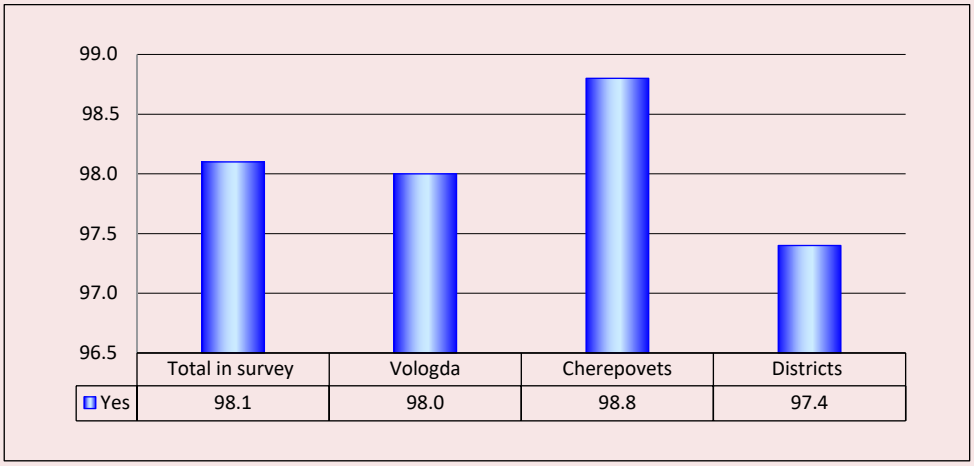
[15] Survey of the Vologda Research Center of the Russian Academy of Sciences "Coronavirus and society". Available at: http://www.vscc.ac.ru/uploads/activity_files/2020/04/13597.pdf (accessed: May 21, 2020).

Table 1. Distribution of responses provided by school teachers of the Vologda Oblast to the question "How did the situation with the spread of a new coronavirus infection (COVID-19) affect your mood?", % of a number of respondents

Answer choice "My mood..."	Total in survey	By the territory			By work experience, years		
		Vologda	Cherepovets	Districts	up to 3	3–20	More than 20
Improved	1.8	3.4	0.0	0.0	3.1	3.9	0.0
Deteriorated	65.1	66.4	62.7	65.0	53.1	68.0	65.7
Unchanged	26.8	23.5	32.5	27.5	34.4	24.3	27.0
I cannot answer	6.3	6.7	4.8	7.5	9.4	3.9	7.3

Source: online survey of school teachers in the Vologda Oblast (VolRC RAS, N = 272).

Figure 1. Distribution of responses provided by school teachers of the Vologda Oblast to the question "Was the transition to distance learning accompanied by problems for the participants of educational relations?" (sum of the "Yes" and "Rather yes" responses), % of the number of respondents



Source: online survey of school teachers in the Vologda Oblast (VolRC RAS, N = 272).

participants of the educational process at school, but the presence of problems was most urgently felt by schoolchildren and students (93%) and their parents (97%; *Tab. 2*).

The problem of families' insufficient provision with equipment necessary for online communication (tablets, laptops, computers, microphones, Webcams, etc.; *Tab. 3*) was mentioned as the most urgent by the teachers. This response position came out on top in both urban and rural areas. Moreover, in rural areas, the problem of providing families with the necessary computer equipment was especially acute – it was noted by 60% of teachers from rural settlements (municipal districts). In the Republic of Bashkortostan, a quarter of parents surveyed reported a lack of devices for organizing the educational process online.

It should be noted that the issue related to the shortage of equipment and software in the field of education during the transition to distance learning has become particularly acute not only in the Vologda Oblast. In early April, the staff of the Higher School of Economics together with experts from the All-Russia People's Front (ARPF) interviewed 29.000 teachers in all regions of the Russian Federation via an Internet platform. This study showed

Table 2. Distribution of responses provided by school teachers of the Vologda Oblast to the question " What participants in educational relations are affected by the problems associated with the transition of schools to distance education?" (sum of "Yes" and "Rather yes" responses), % of a number of respondents

Response option	Total by the survey	By the territory		
		Vologda	Cherepovets	Districts
Schoolchildren's parents	96.3	98.6	96.8	92.5
Schoolchildren	93.1	96.0	89.2	90.0
Teachers	84.6	89.9	74.7	84.6
Schools' administrations	73.9	79.8	62.6	75.0
Other school employees	50.3	49.7	51.8	40.0

Note: when answering a question, more than one response option was allowed.
Source: online survey of school teachers in the Vologda Oblast (VoIRC RAS, N = 272).

Table 3. Distribution of responses provided by school teachers of the Vologda Oblast to the question "What are the problems associated with the transition of schools to distance learning?", % of the number of respondents

Response option	Total by the survey		Vologda		Cherepovets		Districts	
	%	Rank	%	Rank	%	Rank	%	Rank
Insufficient provision with necessary computer equipment in schoolchildren's families	49.3	1	46.3	1	49.4	1	60.0	1
Insufficient provision with necessary technical devices of teachers	34.2	2	36.9	3	22.9	4	47.5	4
Low motivation, students' indiscipline, lack of ability to study remotely	33.8	3	28.9	5	42.2	2	35.0	2
Some classes are very difficult to be conducted remotely	32.0	4	32.9	4	36.1	3	20.0	3
Teachers' lack of such experience	29.0	5	37.6	2	20.5	6	15.0	6
It is psychologically difficult to work in a remote format	22.4	6	24.2	6	22.9	5	15.0	5
Some students do not have Internet access at home	18.0	7	15.4	8	20.5	7	22.5	7
Teachers' lack of the necessary IT skills	15.1	8	18.1	7	12.0	11	10.0	11
Outdated equipment	13.2	9	13.4	9	14.5	8	10.0	8
Lack of administrative and methodological support (low quality of open materials)	12.9	10	12.1	10	13.3	10	15.0	10
Poor quality of Internet connection at school	11.8	11	9.4	12	9.6	12	25.0	12
Lack of additional material incentives	11.0	12	10.1	11	14.5	9	7.5	9
Poor communication with parents	2.9	13	3.4	13	2.4	13	2.5	13
There were no problems	1.5		2.0		1.2		0.0	
Other	0.4		0.0		0.0		2.5	

Note: when answering a question, more than one response option was allowed.
Ranked by the "Total by the survey" column.
Source: online survey of school teachers in the Vologda Oblast (VoIRC RAS, N = 272).

that almost 80% of respondents faced the same problems (20% of "Rather agree" responses, 58% – "Agree")[16].

The problem of technical equipment of households was immediately pointed out by society, and regional authorities started providing poor families with necessary equipment. The mechanisms for this decision were different in regions. In some cases, students were given computers and routers for the period of distance education[17], in others,

[16] Research: teachers faced problems of distance learning. *RIA-Novosti*. Available at: https://ria.ru/20200407/1569666546.html (accessed: June 5, 2020).

[17] Students in need were offered computers and routers for the period of distance learning. *Komsomolskaya Pravda*. Available at: https://www.kp.ru/online/news/3807823/ (accessed: June 25, 2020).

Table 4. Problems in conducting remote classes, %

Response option	Saratov Oblast	Krasnodar Krai	Zabaykalsky Krai	Murmansk Oblast	Republic of Sakha (Yakutia)	Omsk Oblast
Interruptions in the video platform operation the due to the line overload	45	39	42	58	51	47
Slow internet connection makes it difficult to give classes	40	43	35	22	38	31
It is difficult to connect all children to the video feed	44	43	42	42	45	43
Some children can't cope with connecting to a video feed	36	36	34	47	45	38
I have to constantly interrupt classes because someone of the children "crashes"	14	14	12	17	23	14
Other	10	11	13	12	9	15

Source: Saprykina D.I., Volokhovich A.A. *Problems of transition to distance education in the Russian Federation as viewed by teachers*. M.: NIU VSHE, 2020. 32 p.

low-income families were given tablets by the municipal authorities with the participation of sponsors[18].

Similar actions were observed in a number of states [12, p. 18]. Thus, in Canadian schools, laptops and tablets were issued to students at home, and the country launched a program of "technology lending"[19] as well. In the state of California (USA), more than 70 thousand schoolchildren in need were provided with laptops[20].

About 18% of respondents in the Vologda Oblast as a whole (more than 22% in rural areas) paid attention to the problem of the Internet access. In a study by the Higher School of Economics, this figure is higher: 50% of teachers noted that "some students do not have access to the Internet at home" [17]. This situation correlates with statistical data showing that, for example, only 76% of households in the Russian Federation had access to the Internet in 2017 (*Fig. 2*).

The share of households that have access to the Internet, as evidenced by data from the sample federal statistical survey on the usage of information technologies and information and telecommunications networks by the population (*Fig. 3*), differs in federal districts of the Russian Federation. Although the difference is not very large (within 5 p.p.), it nevertheless shows that much more needs to be done in this direction to eliminate problems of distance education in the future.

The current situation is also largely related to such technical problems as low Internet speed (*Tab. 4*), communication channel stability, and equipment ensuring work with video.

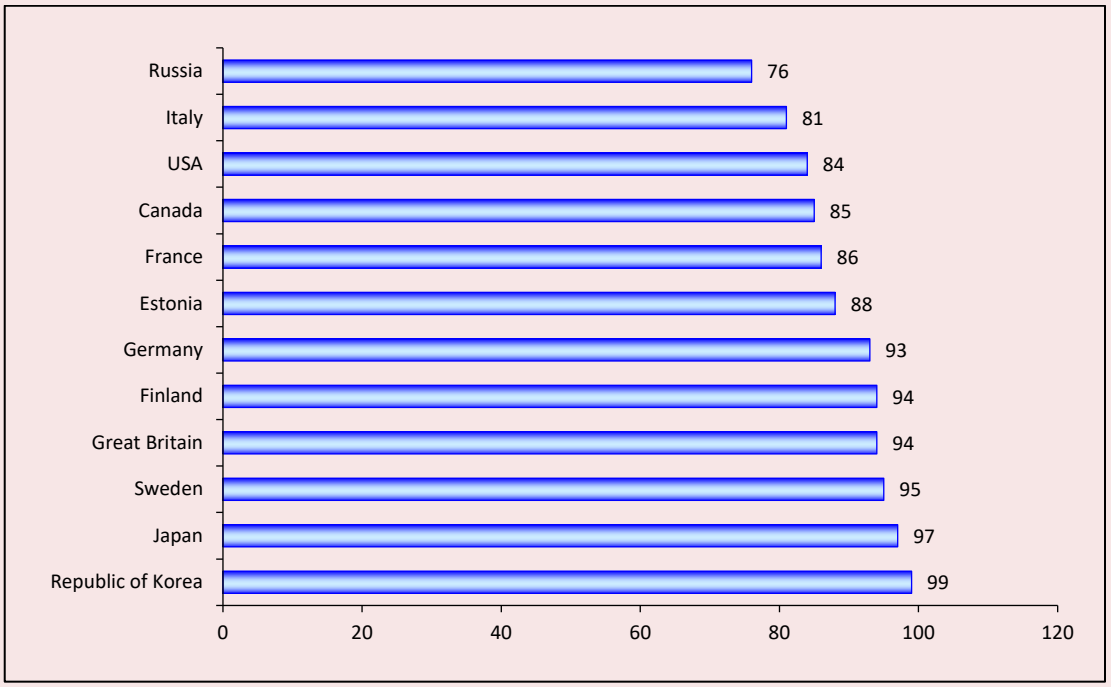
Teachers of the Vologda Oblast also noted the problem of Internet connection, but the share of such responses is low: 11% of cases are caused by poor quality of the Internet connection at school, 18% – by the lack of the

[18] Vologda schoolchildren from low-income families were given the first tablets for distance learning. *Vologda region*. Available at: http://vologdaregion.ru/news/2020/4/16/vologodskim-shkol-nikam-iz-maloobespechennyh-semey-podarili-pervye-planshety-dlya-distancionnogo-obucheniya (accessed: June 25, 2020).

[19] Ferguson E. COVID-19: Schools distribute laptops, paper materials for at-home learning. *Calgary Herald*. Available at: https://calgaryherald.com/news/covid-19-schools-distribute-laptops-paper-materials-for-at-home-learning/ (accessed: June 25, 2020).

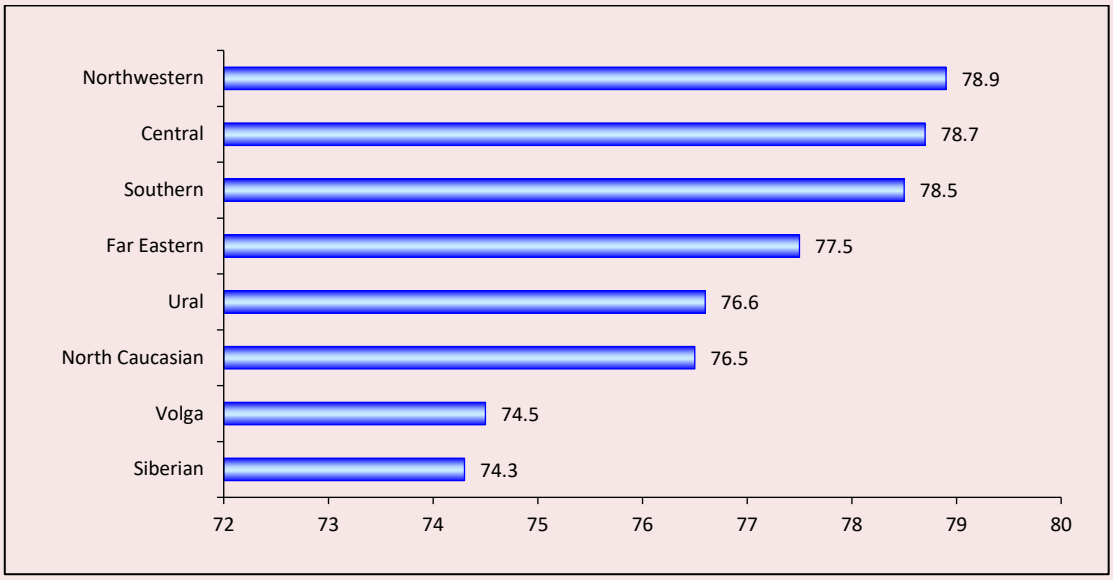
[20] As CA schools remain closed, 70.000 students in need will receive laptops, tablets. Available at: https://ktla.com/news/california/gov-newsom-to-provide-latest-on-covid-19-response-in-california/ (accessed June 25, 2020).

Figure 2. Internet access in households broken down by countries, 2017, % of total households



Source: Abdrakhmanova G.I., Vishnevsky K.O., Gokhberg L.M., et al. *Digital Economy: 2019: Short Stat. Coll.* National Research University Higher School of Economics, Moscow: NIU VSHE, 2019. 96 p.

Figure 3. Share of households with Internet access by federal districts of the Russian Federation (data from the federal statistical survey on the usage of information technologies by the population), %



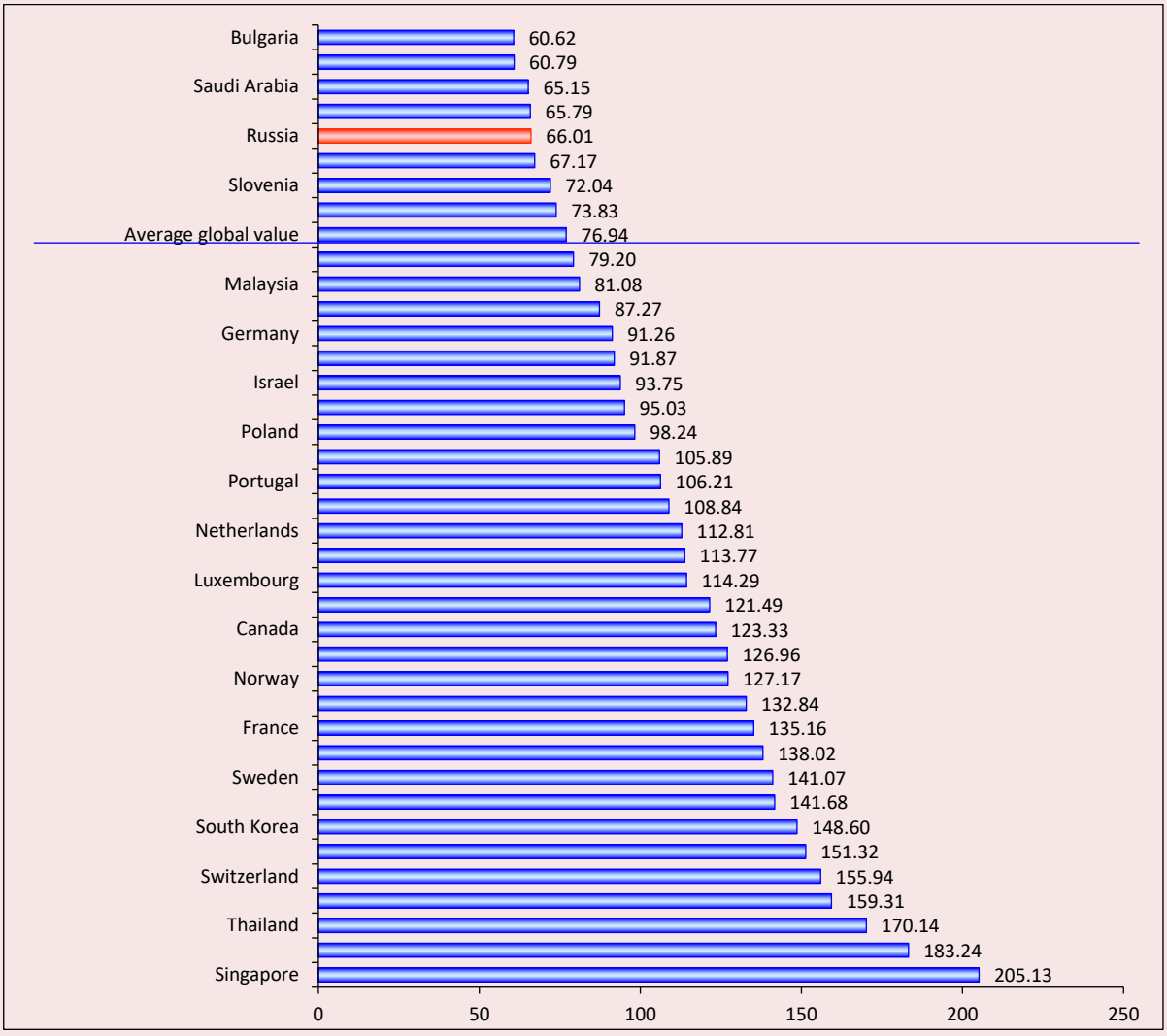
Source: Mendel A.V. *Transition of secondary comprehensive schools to distance learning in the context of the coronavirus pandemic: technological, organizational and pedagogical aspects.* Available at: https://ioe.hse.ru/data/2020/06/09/1605478836/ФО-Практика%20ДО.pdf

Internet connection at home. Schoolchildren's parents in the Republic of Bashkortostan pointed to the lack of stable high-speed Internet in 37% of cases.

According to a teacher living in the country, "speed of home Wi-Fi is less than 10 MB/s. The level of income does not allow paying for a more expensive tariff" [17].

Data from the OOKLA system (Global Internet speed index) shows that the speed of fixed Internet connection in Russia is lower than the global average. In May 2020, it was 66 Mbit/s (*Fig. 4*). It is more than a 3 times lag behind the leader (in Singapore, speed is 205 Mgbit/s). Russia is the 46th in the ranking of 173 countries.

Figure 4. Average speed of fixed Internet connection in countries[21], Mbit/s, May 2020



Source: Global Speedtest index: monthly comparisons of Internet speeds from around the world (OOKLA). Available at: https://www.speedtest.net/global-index (accessed: June 25, 2020).

[21] Up to January 1, 2019, the countries were compared based on 333 unique user results for fixed broadband link, since January 1, 2019, the countries must have at least 300 unique user results to be ranked. The results for the previous month are updated in the middle of the month.

The results of a sample survey of household budgets in Russia for 2019 showed that households spend from 2.2% (Sevastopol) to 5.2% (Chukotka AO) of their funds on fixed Internet connections [18, p.13].

Another problem related to the remote mode was the schoolchildren's decreasing motivation to study. This socio-cultural factor ranked second among the problems by the Cherepovets teachers and the teachers of region's rural schools. It is typical that students' parents also noted that children's motivation to study decreased in general (46%). At the same time, one-third of Bashkir parents (37%) believe that motivation has not changed, and it even increased in 17% of cases. However, the response was primarily chosen by parents with one child in a family (*Fig. 5*).

Top 5 problems of distance education also include the difficulty of conducting some lessons remotely (32% of teachers said that). Among other difficulties, respondents noted the lack of educational materials on online platforms for classes in music, art, subjects of additional education, as well as adapted manuals for children with disabilities[22]. Parents' assessment of the efficiency of distance education in terms of developing children's creativity, abilities for independent work, ability to learn and consolidate new topics in general, also indicate that there are gaps in the system – 72% expressed dissatisfaction with this situation.

A fairly large proportion of teachers (29%) named teachers' lack of distance learning experience a problem. According to a study by the Higher School of Economics, 64% of teachers had experience of using online educational platforms before April 2020 but mostly "in case of a need to work out complex topics in their subject and to complete homework" [17, p. 7]. Nearly half of respondents noted that they sometimes used various online resources in school lessons earlier. Vologda teachers more often used the Internet for professional communication with colleagues and participation in conferences (42%), organization of extracurricular activities (41%). In the first case, the predominant group included older teachers with more than 20 years of experience (47%), in the second one – young teachers with up to 3 years of experience (31%).

Figure 5. Distribution of responses of Bashkir schoolchildren's parents to the question "Has your child's motivation to study changed in the new learning environment?", % of respondents

	Child 1 (the eldest)	Child 2	Child 3	Child 4	Child 5	Child 6 (the youngest)	Total
In general, decreased	31.3	11.8	2.2	0.3	0.2	0.1	46.0
Did not change	25.8	9.2	1.8	0.5	0.0	0.0	37.0
In general, increased	11.3	4.4	0.9	0.2	0.1	0.0	17.0
Total	68.4	25.4	4.9	1.0	0.3	0.1	100.0

Source: data from the parents' sociological survey, Bashkir Branch of the Federal Research Centre of the Russian Academy of Sciences, 2020 (N = 1765).

[22] The teacher shared her opinion about remote learning at school. Available at: https://iz.ru/997400/2020-04-08/pedagog-podelilsia-mneniem-ob-udalennom-obuchenii-v-shkole (accessed: April 28, 2020).

Table 5. Estimates of teachers in the Vologda Oblast regarding the usage of educational online resources in their professional activities in the future, % of the number of respondents

Response option	Total in survey	By the territory			By work experience, years		
		Vologda	Cherepovets	Districts	up to 3	3–20	More than 20
Yes, and more likely yes than no	67.3	66.5	73.5	57.5	71.9	68.9	64.9
No, and more likely no than yes	20.2	18.2	20.5	27.5	16.5	16.5	25.6
This will depend on the position of the school's management	8.8	10.1	6.0	10.0	11.7	11.7	5.8
I cannot answer	3.7	5.4	0.0	5.0	6.3	2.9	3.6
Source: online survey of school teachers in the Vologda Oblast (VoIRC RAS, N = 272).							

Schoolchildren's parents believe that the problems of distance education are not only related to technical and organizational difficulties but also to the inability to maintain good health ("eyesight is going poor", "eyesight, posture, health in general, because with such a load kids do not breathe fresh air", "real undermining of health", "children spend a lot of the time in front of computers, it will affect their health"), education quality ("children will get used to the Internet, they won't be willing to get knowledge themselves", "children become antisocial, ceasing to communicate with each other and teachers. The best education model is "student-teacher live communication")[23].

However, despite identified problems related to the transition to distance education, 36% of Russian population is satisfied with the organization of remote education[24]. The responses of Bashkir parents to the question "Have your children easily adapted to the new learning environment?" were mainly positive: 36% of schoolchildren's parents considered that "a child generally coped, although it took some effort", 21% admitted that "a child easily adapted to the new conditions". And only 5% of responses were negative. The transition to new teaching practices has affected teachers' further planning to use digital educational technologies in their job. For example, the majority of respondents (67%) stated that, even after stabilizing the situation with a new coronavirus infection (COVID-19) spread, they will keep using digital technologies in their classes regardless of their direct management's instructions (*Tab. 5*).

Such intentions are typical for young (72%) and experienced teachers (69%). In rural areas, unlike towns, a desire to extend the digital experience is already shown by a little more than half of teachers (58%). Positive planning for the usage of digital content in professional activities of the teaching staff is caused by the fact that majority of respondents (59%) of different ages generally have a positive attitude to digital innovations in education.

The respondents-teachers' opinion about schools' readiness to work in the new digital environment was less optimistic, which is especially evident in the example of schools at different levels (*Tab. 6*). In rural areas a level of readiness for challenges of educational digitalization is critical (only 18%), according to the responses. According to teachers, "elite" schools (digital schools, gymnasiums, lyceums, schools with advanced study of individual subjects, etc.) are more ready for this. As it is

[23] Open responses of parents of the Republic of Bashkortostan, online survey of the Bashkir Branch of the Federal Research Centre of the Russian Academy of Sciences 2020.

[24] The teacher shared her opinion about remote learning at school. Available at: https://iz.ru/997400/2020-04-08/pedagog-podelilsia-mneniem-ob-udalennom-obuchenii-v-shkole (accessed April 28, 2020).

Table 6. Opinion of teachers of the Vologda Oblast on readiness of organizations of general education for distance learning, % of a number of respondents

Response option	Total in survey	By the territory			By the place of work		
		Vologda	Cherepovets	Districts	Regular secondary comprehensive schools	Elite schools (gymnasiums, lyceums, etc.)	Special schools and schools with inclusive education
Quite ready; rather ready	52.3	57.1	61.2	17.5	46.2	65.9	33.4
Rather not ready; not ready at all	44.8	42.2	33.8	77.5	51.3	31.1	66.6
Rather not ready; not ready at all	2.9	0.7	6.0	5.0	2.5	3.0	0.0
Source: online survey of school teachers in the Vologda Oblast (VoIRC RAS, N = 272).							

known, such educational organizations are innovative platforms for the introduction of digital technologies in the learning process. At the same time, more than half (51%) of teachers, working in regular schools, and more than two-thirds of teachers from special schools (67%) stated that their organizations were not ready for such work format.

45% of schoolchildren's parents did not notice any positive effects from the distance education format but still indicated some of its advantages. For example, one-third of parents mentioned the fact that "a child learns to use new technologies, programs and applications" as a positive consequence of the distance experience (30%), a quarter of respondents considered this experience to be a lesson of "independence and responsibility for children" (28%), and a fifth of them believe that "familiarity with educational programs has taught children to spend time on the Internet profitably" (12%). For many parents, it was a revelation to know "how their child learns, behaves during a lesson, and his or her true level of knowledge".

Conclusions

The conducted research indicated possible difficulties of the distance education format while maintaining the identified complex of various factors, technical, organizational, and socio-cultural ones. All participants in educational relations (households, school employees, schoolchildren and students) were equally unprepared for this situation. It was proved by the following moments:

– technical problems: lack of necessary equipment and Internet connection in some households (which means that teachers had to give and check tasks over the phone via SMS messages). In some cases, teachers also lacked equipment (especially in rural areas);

– methodological problems: lack of digital experience and opportunities for conducting online classes in some subjects; lack of unified requirements, theory and methodology;

– socio-cultural problems: reduction of schoolchildren's educational motivation during remote "home education". According to respondents' statements in their responses to open-ended questions, "it is absolutely impossible to teach remotely, and there is no way for a teacher to determine whether a student learned things that he or she would learn during full-time classes; while giving a formally correct answer, the student's way of thinking may be incorrect" "there is [in the new format] a problem of [widespread] cheating", "it is impossible to obtain high-quality education (especially a school one) [remotely]; children need live communication".

The epidemiological situation had a negative impact on social empathy of teachers (some estimates are lower than the regional average values). However, it only partially affected teachers' professional behavior and organizational culture; for example, a certain decrease of the school staff's desire to use innovative technologies in their regular work, which served as a reaction to the "failure" of distance education.

At the same time, the forced transition to distance education at schools has also shown the prospects for its usage in the future work of educational institutions.

First, the mass implementation of the distance education format made it possible to gain such experience for those who did not use it, or was afraid to use it, during professional activities until April 2020 and to consolidate advantages of such education forms for those who actively used it in their work before the pandemic.

Second, students and schoolchildren gained experience of working independently with electronic materials and learned, or expanded, their knowledge on educational platforms' opportunities. It is going to be a significant help in their further studies.

Third, the teaching community has an opportunity to test their own developments and their colleagues' e-learning materials, to assess its quality, practical usefulness, effectiveness, and inevitable competition in its further development.

Fourth, students' and schoolchildren's parents, in their opinion, were able to see firsthand "how their kid learns, behaves during a lesson and a true level of his or her knowledge".

Fifth, teaching corpus as a whole showed a loyal attitude to digital transformation in education, understanding the prospects of its development. According to teachers, the lack of readiness of the educational network and infra-structure for appropriate innovations may become a constraint during the implementation of national development goals of the Russian Federation.

Taking into account mentioned problems, education authorities need to work out the following problems in the near future:

– select platforms for online learning more carefully, and do it according to class parallels, regions, or other criteria in order to avoid network resource freezing and eliminate a strong dispersion of teachers and students' attention between different courses and methods;

– collect information on availability of necessary equipment in students' families before switching to distance learning;

– foresee rehabilitation measures for children in the new academic year in order for children to resume studies in schools without problems (sparing study schedules, repeat of topics of the 4th quarter of the previous academic year, etc.);

– introduce a planned system for developing distance education for a more efficient transition to it in corresponding conditions.

The results of practical implementation of distance education at schools as an alternative form of organizing the educational process in force majeure environment also revealed some fundamental problems, and without its solution, in our opinion, a mass transition to remote forms of education may lead to irreparable social consequences which include:

– need to re-evaluate the role and participation of a "live" teacher (a teacher who knows peculiarities of age psychology) in the educational process, children's socialization, the formation and upbringing of a person;

– update and integration of studies on socio-psychological needs and patterns of human development in accordance with latest educational methods, approaches, and technologies;

– search for mechanisms excluding the impact of socio-economic status and digital inequality on opportunities for obtaining quality education (as a basic constitutional right of a citizen of the Russian Federation).

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Information about the Authors

Galina V. Leonidova – Candidate of Sciences (Economics), Associate Professor, Leading Researcher, head of laboratory, Vologda Research Center of the Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: galinaleonidova@mail.ru)

Rim M. Valiakhmetov – Candidate of Sciences (Sociology), Acting Dean of Faculty, Bashkir State University (3/4, Karl Marx Street, Ufa, Republic of Bashkortostan, 450076, Russian Federation; e-mail: rim_m_sifat@inbox.ru)

Guzel' R. Baimurzina – Candidate of Sciences (Economics), Senior Researcher, Acting Director, Bashkir Branch of the Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences (20/1, 50-letiya Oktyabrya Street, Ufa, Republic of Bashkortostan, 450005, Russian Federation; e-mail: guzrim@mail.ru)

Lyubov V. Babich – Candidate of Sciences (Economics), Deputy Director, Head of Department, Vologda Research Center of RAS (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: lvbabich @vscc.ac.ru)

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