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Contemporary Virtual Social Environments as a Factor of Social Inequality Emergence*

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Abstract. *The paper deals with the problems of social inequality. On the one hand, the contemporary virtual social environments promote levelling out the social inequality in many cases, while on the other hand, they are but a source of social inequality as well. The limited physical access to information and communication technologies, the distinctions of information and communication competencies of users, physiological peculiarities of people, and information threats were analyzed as examples. The secondary data of the results of sociological surveys were used for the analysis. Using the case of Russia, the mechanisms for levelling out the social inequality are demonstrated. The work is of practical value for specialists dealing with problems of social inequality and the development of the contemporary information and communication technologies.*

Keywords: social inequality, the Internet, the disabled, information and communication technologies, virtual social environments, information threats.

Introduction

Throughout the history of humankind, social inequality has been one of the most burning issues. People are unequal to each other in their physical and mental capacities. Inequality follows from the laws of nature and ensures the diversity of social statuses of a person in the society.[1] The development of community relations is accompanied by the emergence of new kinds of inequality.

The current situation is characterized by the rapid development of information and communication technologies that allow creating new virtual social environments with preset properties.[2] In their previous works, the authors analyzed the opportunities of using virtual social environments as a tool for leveling out the social inequality and eliminating social injustice in

* This research was supported by the Russian Foundation for Basic Research (grant № 16-01-00306-a).

1 S. Sernau, *Social Inequality in a Global Age*, Thousand Oaks, CA, Sage, 2013, 400 p. N. G. Osipova, "Problems of the contemporary global inequality", in *Bulletin of Moscow University, Series: Sociology and Politology*, XVIII (2014), no. 2, p. 119–141. Cf. Datsyk Andrey Anatolevich, Svetlana Igorevna Grudina, Alla Igorevna Podgornaya, Sofja Genadevna Avdonina, "New technologies and their impact on the development of the labor market," in *Astra Salvensis,* V (2017), Supplement no. 1, p. 385-390.

2 G. B. Pronchev, "Remote access educational information system", in *Technologies for Building Education Systems with Specified Properties*, The materials of the 3rd International scientific and practical conference, November 12–13, 2012, Moscow, p. 284–286.

the sphere of public administration, in interaction of various state agencies and the civic society, in social work with the population.[3]

The development of information and communication technologies opens up new unique opportunities for organizing the academic process that enhance motivation of students and the efficiency of learning,[4] and for creating a barrier-free environment for the visually impaired people, as a result of which they can participate in the social and economic life on equal terms with the healthy ones.[5] Nevertheless, the authors believe the contemporary information and communication technologies are not only a means for leveling out the existing social inequality but also a source of new kinds of it.[6]

Meanwhile, most surfacing kinds of social inequality are caused by the impossibility for a certain social group to make use of advantages provided by the contemporary information and communication technologies for whatever reason.

The work is dedicated to analyzing the social inequality resulting from the development of information and communication technologies and possible ways for leveling it out.

Methodological framework

The work deals with analyzing the social inequality emerging as a result of the development of information and communication technologies and possible ways for leveling it out.

The main tasks of the research are:

1. Searching for causes of social inequality resulting from the development of the contemporary IT-based communications.

2. Analyzing the measures taken in Russia for leveling out the causes of social inequality emerging.

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[3] G. B. Pronchev, D. N. Monakhov, V. K. Kovalchuk, "Contemporary Internet as a Means for Leveling Social Inequality in the Context of Relationships between Civil Society and the State", in *International Journal of Environmental and Science Education*, XI (2016), no. 17, p. 9959–9967. G. B. Pronchev, I. V. Goncharova, S. O. Elishev, N. P. Khodakova, "Accessibility of Virtual Social Environments for the Visually Impaired as a Means for Leveling Out Social Inequality in Russia", in *Man in India*, XCVII (2017), no. 16, p. 107–116.

[4] G. B. Pronchev, "Remote access educational information system", in *Technologies for Building Education Systems with Specified Properties*, The materials of the 3rd International scientific and practical conference, November 12–13, 2012, Moscow, p. 284–286.

[5] G. B. Pronchev, I. V. Goncharova, S. O. Elishev, N. P. Khodakova, "Accessibility of Virtual Social Environments for the Visually Impaired as a Means for Leveling Out Social Inequality in Russia", in *Man in India*, XCVII (2017), no. 16, p. 107–116.

[6] Cf. Victoria A. Lez'er, Dmitriy A. Izvin, Vladislav A. Sokolov, "Virtual reality: concept, phenomena and ways of implementation in the educational environment (holistic approach)," in *Astra Salvensis,* VI (2018), Supplement no. 1, p. 671.

The methodological basis of the research was formed by the systemic and structural method which is a sequence of actions for establishing structural associations between variables or elements of the system under study.

In the work, secondary data of the results of both Russian and foreign sociological surveys were used.

Results and discussion

Physical access to information and communication technologies. The cause of a limited physical access to information and communication technologies can be for instance the level of material wealth.

According to surveys conducted by Pew Research Center in 40 different countries of the world in 2015[7], 67% of the population said they either use the Internet "from time to time" or they "use a smartphone". These respondents were categorized by the researchers as users of the Internet.

The highest indices of the users' access to the Internet global network are in South Korea (94%), Australia (93%) and Canada (90%). The USA, the UK, Spain and Israel have the indices of over 80%.

In many large developing countries, the Internet is used by over 60% of the population. In particular, in Russia and Turkey the figure is 72%, in Malaysia – 68%, in China – 65%, and in Brazil – 60%.

The Internet access indices are much lower in the poorer countries: it is 39% in Nigeria, 30% in Indonesia, and 22% in India.

The lowest figures are registered with the poorest countries which participated in the research, namely, it is 18% in Burkina Faso, 15% in Pakistan, 11% in Uganda, and 8% in Ethiopia[8].

Another cause of the lack of physical access to information and communication technologies can be the remote location of a social group. This is especially relevant for countries that are large in area.

As A. V. Naghirnaya notes, "in Russia the Internet is spread according to the principle of hierarchical diffusion of innovations (from the center toward the periphery). Due to the non-uniform settlement, the diffusion is discrete and gradually involves urban locations of various size

[7] J. Poushter, Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies, Pew Research Center, 2016, 45 p., Downloaded 25.02.2018, from http://assets.pewresearch.org/wp-content/uploads/sites/2/2016/02/pew_research_center_global_technology_report_final_february_22__2016.pdf, acccessed 25. 02. 2018.

[8] J. Poushter, Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies, Pew Research Center, 2016, 45 p., Downloaded 25.02.2018, from http://assets.pewresearch.org/wp-content/uploads/sites/2/2016/02/pew_research_center_global_technology_report_final_february_22__2016.pdf, accessed 25. 02. 2018.

(from the largest to large cities, medium ones and towns), coming to the rural areas afterwards."[9]

Obviously, in the prospect, once the levels of economic development of different countries and regions are lined up and the relevant physical infrastructure is provided, this cause of social inequality must be neutralized.

Currently, a number of companies use the CYOD (Choose Your Own Device) and COPE (Corporate-Owned, Personally Enabled) models for increasing the opportunities of the users' access to the information resources.[10]

Within the CYOD model, an enterprise provides its employees with a number of digital devices. An employee can select from the offered range the device which suits the employee's work tasks and personal preferences best. Servicing of the digital devices is undertaken by the enterprise.[11] Research has shown that in this model, the productivity of employees increases if they use the digital devices not only for work but for personal purposes too.[12] However, in this case conflict situations are possible arising from having to pay for downloading entertainment content: music, videos etc.

Under the COPE model, a company hands over digital devices to its employees at their disposal, the devices to be serviced by the employees independently. COPE can only be applied if the users have sufficient knowledge and skills of handling the devices, operation systems and servicing techniques.[13]

Different information and communication competencies of users. Currently, the lack of the relevant education as well as of the required information and communication competencies is an essential cause of social inequality when accessing the information and communication technologies.

First of all, this can be explained by people having different education: they specialize in humanities or technology, they have the higher or secondary education, and so on.

Secondly, this can result from the fact that many information and communication technologies did not exist so could not be studied back then, as different age groups completed their learning.

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[9] A. V. Naghirnaya, "The development of the Internet in regions of Russia, Proceedings of the Russian Academy of Sciences", in *The Geographical Series*, II (2015), p. 41–52.

[10] R. Himmelsbach, "What is behind the concepts BYOD, CYOD, COPE, LAN", in *Network Solutions Journal*, VI (2013), p. 62–64. E. Goretkina, "Prospects and realia of corporate mobility", in *PC Week/RE*, DCCCLXXII (2014), no. 17.

[11] E. Goretkina, "Prospects and realia of corporate mobility", in *PC Week/RE*, DCCCLXXII (2014), no. 17.

[12] R. Himmelsbach, "What is behind the concepts BYOD, CYOD, COPE, LAN", in *Network Solutions Journal*, VI (2013), p. 62–64.

[13] E. Goretkina, "Prospects and realia of corporate mobility", in *PC Week/RE*, DCCCLXXII (2014), no. 17.

Thirdly, the gender inequality being observed can be considered among the causes too.[14] The data collected in the report of the International Telecommunications Union show that the digital gender gap has shrunk to 2,8% in 2017 as compared to 2013 in the developed countries (ones with accessibility of the Internet amounting to 80%). The situation is much worse in the developing countries, the gap being 16,1%, and so high as 32.9% in the less developed ones.[15]

It should be pointed out that over this time span in Russia the gap between the Internet use levels between men and women has shrunk from 6,5% (25,8% and 19,3%, respectively) down to 1,3 % (78,4% and 77,1% respectively). As for the most active (daily) users of the Internet, the Russian women are up there with the men (the corresponding figures are 55.3% and 55.0%), and even outperform the men in the rural area (42.7% vs. 44.8%)[16].

One of the possible explanations of the gender gap may be the different training in the area of information and communication technologies in men and women. In 2014, the percentage of women completing the higher education in Russia was 58%. At the same time, it was only 30% in the main directions of training associated with the information and communication technologies.[17]

The solution method for the problem is evident: the level of expertise in information and communication technologies has to be lined up. Close attention is paid to this in Russia.

The December 13, 2017 session of the Presidium of the Presidential Council of the Russian Federation for strategic development and priority

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[14] *GGGR*, *The global gender gap report 2017*, The World Economic Forum, Geneva, Switzerland, 2017, 361 p., Downloaded 25.02.2018, from http://www3.weforum.org/docs/WEF_GGGR_2017.pdf. This aspect has been debated also in Church meetings like the Council of Crete, by the Orthodox Church bishops. Cf. Iuliu-Marius Morariu, "Bioethics in the Discussions of the Pan-Orthodox Synod from Crete (2016)", in *Astra Salvensis,* IV (2016), no. 7, p. 251.

[15] *MISR, Measuring the Information Society Report 2017,* International Telecommunication Union, Geneva, Switzerland, I (2017), 154 p., Downloaded 25.02.2018, from https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2017/MISR2017_Volume1.pdf.

[16] G. I. Abdrakhmanova, G. G. Kovaleva, O. K. Ozerova, Z. A. Ryzhikova, "Gender aspect in digital economy", in *Information Bulletin*, III (2016), no. 8, available at: https://www.researchgate.net/publication/305165611_gendernyj_aspekt_v_cifrovoj_ekonomike, accessed: 25.02.2018.

[17] G. I. Abdrakhmanova, G. G. Kovaleva, O. K. Ozerova, Z. A. Ryzhikova, "Gender aspect in digital economy", in *Information Bulletin*, III (2016), no. 8, available at: https://www.researchgate.net/publication/305165611_gendernyj_aspekt_v_cifrovoj_ekonomike, accessed: 25.02.2018.

projects considered a project targeted at implementing the digital technologies from the school learning time on, the "Digital school."[18]

It focuses on shaping the young people's information and communication competencies "for them to know how to operate the most diverse tools for processing the required arrays of information and to be able to free the forces for creativity in the future..."[19] The policy of Russia will be aimed at creating favorable conditions for distance learning and online education.

At present, Russian school educational platforms have been launched that can be worked with using not only the conventional desktop computers but also the modern mobile devices, in particular:

- Uchi.ru (available February 25, 2018: https://uchi.ru) builds an individual educational path for each student in all school subjects.
- YaKlass (available February 25, 2018: http://www.yaklass.ru) links up all digital class register users in a united system; it is also a tool for preparation for the BSE/USE.
- Lecta (available February 25, 2018: https://lecta.ru) has digital forms of textbooks.
- MESH (Moscow e-school, available February 25, 2018: https://mes.mos.ru) is aimed at the efficient use of IT-opportunities of school.

For the young people, an equally high level of training in information and communication technologies is essential regardless of the educational institutions they study at, while additional education has to be organized for the older generation.

Here are some examples of platforms created for the purposes:

- Stepik (available February 25, 2018: https://welcome.stepik.org/ru) – learning is free for higher education institution students.
- Yandex school (available February 25, 2018: http://www.intuit.ru) offers a free training for specialists both for Yandex itself and for IT-industry.
- Universarium (available February 25, 2018: http://universarium.org) hosts free courses including video lectures, home assignments, tests, group work, final assessment etc.

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[18] *PC, On the new priority project "Digital school", on the progress of priority projects "E-health" and "Reform of control and supervisory activities"*, The December 13, 2017 session of the Presidium of the Presidential Council of the Russian Federation for strategic development and priority projects, 2017, available at: http://government.ru/news/30568, accessed: 25.02.2018.

[19] *PC, On the new priority project "Digital school", on the progress of priority projects "E-health" and "Reform of control and supervisory activities"*, The December 13, 2017 session of the Presidium of the Presidential Council of the Russian Federation for strategic development and priority projects, 2017, available at: http://government.ru/news/30568, accessed: 25.02.2018.

In Russia, the information and communication competencies in the older generation are also improved at further training and retraining courses for the relevant specialities. The module associated with the area of information and communication technologies is compulsory on all additional professional education.

Examples of this can be the websites for further training and retraining of teachers of Moscow region of the "Academy of social management" state budget-funded educational institution of higher education of Moscow Region:

- Digital further training courses (available February 25, 2018: http://dot.asou-mo.ru).
- Courses in the form of digital (virtual) on-the-job training (available February 25, 2018: http://vs.asou-mo.ru).
- Digital retraining courses (available February 25, 2018: http://do.asou-mo.ru).

Thus, it can be stated that the population of Russia have an access to the lifelong development of their information and communication competencies.

Physiological peculiarities of people. Social inequality is also caused by the impossibility of using the information and communication technologies due to physiological peculiarities, e.g. for the visually impaired.

According to the World Health Organization, currently, there are about 285 million people in the world having vision disorders, 39 million of them being blind and 246 million suffering from low vision. 19 million children aged under 15 have vision disorders, and 1,4 million children who got permanent blindness for the remaining life need visual rehabilitation measures[20].

The principal problem of people having vision disorders is the impossibility to perceive visual information. The main communication channels for them are sense of touch and hearing. As a rule, the existing information systems for the visually impaired use the speech synthesis software and devices called Braille display which enables them to work with the conventional PC.[21]

Within the State Program of the Russian Federation "Accessible environment", accessibility website versions are created for the visually impaired that are regulated by GOST R 52872-2012 which became effective on January 01, 2014. As a result of completion of the Program, first of all,

[20] "WHO, Visual impairment and blindness. World Health Organization (WHO)", in *Fact Sheet*, no. 282, 2014, available at: http://www.who.int/mediacentre/factsheets/fs282/en, accessed: 25.02.2018.

[21] E. V. Lotoreva, "The integration of visually impaired people into information society", in *Society*: *Sociology, Psychology, Pedagogy*, no. 1–2, 2011, p. 94–98.

the websites of state organizations and secondly, the websites granting some services, e.g. educational ones, will have special features enabling the people having vision disorders to use them[22].

As of today, in Russia there have been created enough Internet resources targeted at visually impaired or hearing impaired children, e.g.:

- The portal of the Federal center of information and educational resources (FTSIOR) (available February 25, 2018: http://fcior.edu.ru).
- A collection of digital educational resources (available February 25, 2018: http://school-collection.edu.ru).

As information and communication technologies develop further, it is likely that they will continue eliminating this cause of social inequality.

It should be mentioned that in order to solve the problem, special tutors have to be trained too who will teach the disabled people in this sphere[23]. As a rule, it is the regional methodological centers that prepare specialists of this kind.

Currently, the priority directions in development of the use of information technologies in special education are the creation of infrastructure which is up to the special needs of the learners and the methodologically skillful integration of information technologies into the academic process.

One of the main advantages of using the computer means of learning in education for the disabled children is their vast opportunities of visualizing the study material presented[24]. The use of the state-of-the-art graphic and multimedia means, software, diagnostic sensors and devices allows creating vivid and efficient dynamic models. In their turn, they allow not only identifying the condition of this or that function in a person but also seeing the objective difficulties a learner has and overcoming them with the means available.

Information threats. Another cause of emergence of social inequality is the limited use of information and communication technologies due to actions of law-breakers[25]. As a result, the accessibility, integrity, or confidentiality of information for a user can be affected.

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[22] I. V. Goncharova, G. B. Pronchev, "Virtual social environments for people with vision disorders", in *Politics and Society*, V (2015), p. 586–590.

[23] G. B. Pronchev, I. V. Goncharova, "On training of visually impaired people to work with the modern information-communication technologies", in *Law and Education*, V (2016), p. 58–64.

[24] D. N. Monakhov, *Visualization of Information: Genesis, Problems, Trends*, Moscow, MAX Press, 2012, 57 p.

[25] G. B. Pronchev, D. N. Monakhov, V. V. Lontsov, "Security of virtual social environments in the information society", in *Space and Time*, XIV (2013), no. 4, p. 231–236. A. P. Mikhailov, A. P. Petrov, O. G. Proncheva, N. A. Marevtseva, "A model of information

According to their origin, the information attacks on a user can be:

- Local (the source of which is local-network users or software).
- Remote (the source of which is the remote users, network services or applications).

According to the activity, there are the following information attacks:

- Active ones (the result of their effect is the disruption of information communications activity).
- Passive ones (they are oriented to obtaining certain information without disrupting the functioning of information communications).

According to the results of the voluntary all-Russian survey "Sputnik" conducted among the Russians aged 18 and older by the Russian public opinion research center (VCIOM) on April 3-4, 2017, the following answers were obtained to the question "If the Internet disappears tomorrow, how much will that change your habitual life?" (it was a closed-type multiple-choice question with only one option to be selected). 5% said it would change their life completely and they would not know how to go on about daily actions without the Internet. 22% said it would change their life considerably but they would be able to adapt, while 26% stated it would change little in their life. 47% said it would not change anything in their life, with 0% choosing the option of being not sure to answer.[26] So, according to this survey, it is only 27% that would see change in their life. However, this refers to daily life and not to emergency situations. For instance, if an operation is in progress at a hospital, and the hospital's telecommunication portal stops functioning due to a law-breakers' attack, the consequences may be bleak.

According to the all-Russian research[27] in 2017, 48% of the Russian companies faced various threats in the information sphere, with 22% of them incurring financial losses due to hacker attacks. The resulting damages incurred by the enterprises due to the lawbreakers' activity amounted to 115,96 billion rubles.

There was the following distribution of answers according to the types of information threats encountered in 2017 (the respondents could select several answer options). 20% of the respondents pointed out infecting the work computers of the employees with viruses, including ransomware ones. 12% said the mailboxes of the company employees were hacked.

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warfare in a society under a periodic destabilizing effect", in *Mathematical Models and Computer Simulations*, IX (2017), no. 5, p. 580–586.

[26] *VCIOM, What if there is no Internet?!,* Press release of VCIOM No. 3346 of April 7, 2017, available at: https://wciom.ru/index.php?id=236&uid=116148, accessed: 25.02.2018.

[27] *NAFI, Russian companies lost at least 116 billion rubles due to cyberattacks in 2017, Russian (omnibus) survey of businessmen by NAFI*, 2017, available at: https://nafi.ru/analytics/rossiyskie-kompanii-poteryali-ne-menee-116-mlrd-rubley-ot-kiberatak-v-2017-godu, accessed: 25.02.2018.

Attacking the corporate website (hacking, virus infection, DDOS attack) was mentioned by 10%, and the Internet fraud (deception in order to get money or confidential information) – by 7%. 3% experienced unauthorized access to the enterprise information, 2% - the theft of customers' personal data, with 7% mentioning other issues. 52% said the problem was not listed in the options, and 4% refused to answer.[28]

The issue has remained topical since the time when the modern information and communication technologies were created. This cause of social inequality cannot be neutralized without special measures taken by the state.

Conclusion and recommendations

Scientific and technological advance and the development of information and communication technologies are accompanied by creation of new virtual social environments which in many cases promote leveling out the existing kinds of social inequality. Meanwhile, distinctions in access to new information and communication technologies give certain advantages to various social groups. Therefore, the development of these technologies furthers the rise of new kinds of social inequality.

Nevertheless, in Russia, there exists social inequality caused by the development of information and communication technologies.

In order to eliminate the new kinds of social inequality resulting from the development of information and communication technologies, various methods are used in Russia. Information and communication technologies access points are installed in public places (libraries, educational institutions, state institutions, parks, underground etc.). IT-literacy campaigns for citizens are conducted, which is provided for by the State Program of the Russian Federation "The information society (2011-2020)". In a number of higher education institutions, they teach the senior citizens according to the SP of the RF "On the development of the additional education system for the seniors". They also teach the information technologies to the disabled ones according to the "Accessible environment" SP of the Russian Federation for the years 2011-2015, the Law "On social protection of the disabled people in the RF", and regional-level social programs the objective of which is training the disabled in information technologies for their further employment.

[28] *NAFI, Russian companies lost at least 116 billion rubles due to cyberattacks in 2017, Russian (omnibus) survey of businessmen by NAFI*, 2017, available at: https://nafi.ru/analytics/rossiyskie-kompanii-poteryali-ne-menee-116-mlrd-rubley-ot-kiberatak-v-2017-godu, accessed: 25.02.2018.