Digitalization of higher education in the context of information inequality

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Abstract. The article examines the issues of information inequality in the context of digitalization of education in the higher education system of the Russian Federation. The difference between the concepts of “digital divide” and “digital inequality” is made, the specifics of these terms in relation to the digital educational environment are revealed, and the concept of “new digital divide” is given. As digital technologies are becoming more accessible today, the technological aspect of the digital divide in education will become less significant over time. The presence of digital inequality in the activities of Russian universities in the digital educational process is considered in a regional context, the leaders and outsiders of this process among the constituent entities of the Russian Federation are highlighted, problem areas in the context of digital educational activities are identified, and key directions of the national strategy for the digital transformation of education are proposed.

If relatively recently, experts in information and communication technologies (ICT) talked mainly about the “digital divide” among different groups of the population who have access to computers and the Internet, and those who do not have this access or it is limited, today experts are increasingly speaking about the formation of a new type of information inequality [1, 2].

A consequence of the acceleration of the pace of digitalization and the use of starting advantages by the leaders of the digital world is the effect of accumulated advantage - a social phenomenon manifested in the uneven distribution of advantages, in which the party who initially possesses them continues to increase them, while the other, initially limited party, turns out to be even more deprived and therefore has a lower chance for further success.

When analyzing the digital divide in various spheres of socio-economic development, including education, a number of specialists are critical of the overemphasis on assessing quantitative indicators of connection or connectivity [3]. Connectivity alone does not reduce the level of information inequality and the resulting social and economic divide, which are becoming increasingly interdependent in a digital society. The development of ICT infrastructure is a necessary, but not sufficient condition for reducing the digital divide and a more equitable distribution of the benefits from digitalization in society, as well as providing an opportunity for all segments of the population to exercise their rights or participate in the digital economy. Digitalization preferences are determined not only by the level of connectivity, but also by the intensity of the use of information and communication technologies, as...
well as by the types of activities in the production and consumption of which new technologies are directly used. This is a difference between the concepts of “digital divide” and “digital inequality”. The first term characterizes to a greater extent the assessment of the level of involvement in the digitalization process, while the digital inequality is becoming an increasingly multidimensional concept, especially in the context of the accelerating pace of digitalization, since information and communication technologies themselves are becoming a key resource providing access to other resources necessary for economic growth, improvement of the level and quality of life of the population [4].

The dynamics of the digital inequality today is caused by a number of factors, including educational. In the field of education, the term “digital divide” refers to the difference that arises between participants in the educational process who have access to the Internet and various types of digital gadgets, sources and services in educational institutions and at home, and those who are deprived of such access. Speaking about this type of digital divide, the term “technological digital divide” is most often used today. Improving ICT is reducing the technological digital divide. As digital availability grows at an ever faster pace, over time, the technological dimension of the digital divide in education will become less significant as a factor of inequality.

Research data of a number of specialists indicate that in the field of education, simultaneously with the reduction of the technological digital divide, a gap in the use of digital technologies themselves is currently growing, for which the concept of “new digital divide” is used [5].

The new digital divide means the inequality among people who are active users of digital technologies for creative, productive activities, and people who use digital technologies passively to carry out traditional functions (communications, reproducing traditional telephony, delivery of audiovisual content, etc.). This new digital divide is inherent in all areas where digital technologies are present, representatives of all social groups and various strata of society, communities with high and low proportions of the poor. It takes place both in secondary and higher education [6]. It should be noted that the new digital divide is exacerbating the “traditional” educational inequality caused by different cultural and social capabilities of students from different social groups.

In some countries, the technological digital divide in education is minimal. All participants of the educational process have constant access to high-speed Internet and mobile digital devices, and a full-fledged digital educational environment is deployed in educational institutions. But the implementation of the concept of a “knowledge society” has become a reality only in those countries where the principles of openness and accessibility both in the field of education and information technology are really implemented, as well as the management system of which is agreed at the state and regional levels. As for Russia, the digital divide is one of the pressing problems in the education sector.

Let us further analyze a number of aspects of educational activity in the digital educational process based on digital traces of different types of activities of students and teachers on the educational platform "Yurait". We will take as a basis the temporal characteristics (in days), which show how long a particular university has been conducting its educational process on the platform since the beginning of the 2019-2020 academic year. This indicator includes various types of educational activities: reading, abstracting and discussing educational texts; listening to educational audio content and completing assignments based on educational video content; adaptive testing; educational interaction of students and teachers [7].

It should be noted that in addition to the quite expected leadership positions of universities in Moscow and St. Petersburg with a naturally high degree of implementation of digital elements of the educational process, not all places in the top ten are represented by metropolitan higher education organizations. The rapid and successful adaptation of regional universities to the changing educational environment, together with the corporate culture and competent management decisions of the administrations of these universities, allowed them to enter the top ten educational organizations leading the digital educational process from the beginning of the 2019-2020 academic year. The corresponding data are shown in table 1.
Table 1. Leaders of the digital educational process in the Russian Federation from the beginning of the 2019-2020 academic year.

| No. | Name of the educational organization of higher education                                      | Implementation of the educational process by the university on a digital educational platform, in days |
|-----|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| 1.  | Russian Academy of National Economy and Public Administration under the President of the Russian Federation (Moscow) | 16 127                                                                                         |
| 2.  | Ural State Law University (Yekaterinburg)                                                     | 9955                                                                                           |
| 3.  | Russian State University of Justice (Moscow)                                                   | 9006                                                                                           |
| 4.  | Financial University under the Government of the Russian Federation (Moscow)                  | 8648                                                                                           |
| 5.  | Irkutsk State University (Irkutsk)                                                            | 5445                                                                                           |
| 6.  | O. E. Kutafin Moscow State Law University (Moscow)                                             | 4787                                                                                           |
| 7.  | G. V. Plekhanov Russian Economic University (Moscow)                                           | 4419                                                                                           |
| 8.  | Kuban State University (Krasnodar)                                                            | 3898                                                                                           |
| 9.  | National Research University "Higher School of Economics" (Moscow)                            | 3114                                                                                           |
| 10. | Russian Customs Academy (Lyubertsy)                                                          | 2804                                                                                           |

The regional assessment indicates a significant gap in the digitalization of the educational process between and within various federal districts. Table 2 does not consider data on universities in Moscow and St. Petersburg, since they traditionally have advantages and, accordingly, have proven themselves in the best way in the digital transformation of the educational process.

The strong positions of universities in the Central, Volga and Siberian Federal Districts are due to the presence of large educational clusters in the cities of Kazan, Nizhny Novgorod, Saratov, Tomsk, Novosibirsk, Omsk. Each of the clusters is competitive in terms of competition for applicants with the capital's universities [8].

The average indicators of universities in the Northwestern, Ural and Far Eastern Federal Districts are associated with infrastructural problems caused by the relative isolation of local research and educational centers by geography. Therefore, the primary task here is to involve remote educational institutions of higher education in a single digital educational field of the Russian Federation.

The South and North Caucasian Federal Districts can be considered a problem area for educational development. On the one hand, in the digitalization of the educational process, the southern regions are inferior to other subjects of the Russian Federation. On the other hand, it is for the southern regions that demographic specificity is characteristic, suggesting a higher inflow of young people into the sphere of higher education compared to other subjects of the Russian Federation. Currently, the task of local universities and regional authorities is to significantly and quickly modernize the educational process, to prevent "brain drain" in the capital's educational centers and universities in other subjects of the Russian Federation. Otherwise, the southern regions will deepen the digital divide in education and lose the most promising part of human capital.

Data reflecting the participation of regional universities of the Russian Federation in the digital educational process from the beginning of the 2019-2020 academic year are presented in table 2.

Obviously, the domestic educational system cannot move to a full-fledged digital higher education at once. Since the process of digitalization itself is contradictory and proceeds with a number of institutional, technical and methodological obstacles, digital educational gaps at this stage of the country's socio-economic development are inevitable. Moreover, digital gaps are present not only in the context of regions, but also in the context of a university's industry affiliation, form of ownership (gaps between state and non-state universities), etc.
**Table 2.** Leaders of the digital educational process among regional universities of the Russian Federation in the context of federal districts from the beginning of the 2019-2020 academic year.

| No. | Name of the educational organization of higher education | Implementation of the educational process by the university on a digital educational platform, in days |
|-----|--------------------------------------------------------|-----------------------------------------------------|
| 1.1 | P.G. Demidov Yaroslavl State University                | 1032                                                |
| 1.2 | Smolensk State University (Smolensk)                  | 805                                                 |
| 1.3 | Tula State University (Tula)                           | 674                                                 |
| 2.1 | Irkutsk State University (Irkutsk)                    | 5445                                                |
| 2.2 | Altai State University (Barnaul)                       | 1648                                                |
| 2.3 | Tomsk State University of Control Systems and Radioelectronics (Tomsk) | 1116 |
| 3.1 | Immanuel Kant Baltic Federal University (Kaliningrad)  | 1473                                                |
| 3.2 | Pskov State University (Pskov)                         | 770                                                 |
| 3.3 | Murmansk Arctic State University (Murmansk)            | 766                                                 |
| 4.1 | N.I.Lobachevsky National Research Nizhny Novgorod State University, (Nizhny Novgorod) | 2743 |
| 4.2 | Saratov State Law Academy (Saratov)                    | 2147                                                |
| 4.3 | Bashkir State University (Ufa)                          | 2019                                                |
| 5.1 | Ural State Law University (Yekaterinburg)              | 9955                                                |
| 5.2 | Chelyabinsk State University (Chelyabinsk)             | 1703                                                |
| 5.3 | Surgut State University (Surgut)                       | 608                                                 |
| 6.1 | Khabarovsk State University of Economics and Law (Khabarovsk) | 711 |
| 6.2 | Vladivostok State University of Economics and Service (Vladivostok). | 708 |
| 6.3 | Zabaikalsky State University (Chita)                    | 639                                                 |
| 7.1 | Pyatigorsk State University (Pyatigorsk)               | 1374                                                |
| 7.2 | K.L. Khetagurov North Ossetian State University (Vladikavkaz) | 381 |
| 7.3 | Stavropol State Pedagogical Institute (Stavropol)       | 248                                                 |
| 8.1 | Kuban State University (Krasnodar)                     | 3898                                                |
| 8.2 | Sevastopol State University (Sevastopol)               | 1460                                                |
| 8.3 | V.I. Vernadsky Crimean Federal University (Simferopol)  | 921                                                 |

Therefore, the domestic strategy for the digital transformation of education, first of all, should focus on the following areas of activity:

- reducing inequality of access to digital technologies through the formation and development of a modern digital educational environment, including broadband Internet access and an increase in wireless access zones in universities, the development of network services, the widespread use of modern digital tools by all participants in the educational process;
• overcoming inequality in the use of digital technologies through a radical modernization of the content and methods of educational activities, improving educational programs, introducing effective digital materials into the practice of educational activities of universities, as well as organizing personalized training for students.

Works within the first direction are supporting. Effective implementation of the results obtained within the framework of this activity into the higher education system is impossible without changing the current regulatory and legal framework, the development and implementation of which are related to the works of the second direction.

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[8] Yurait. Statistics: national and regional statistics of digital activity of universities https://urait.ru/info/stat? & Type = vuz # table-data