

UDC: 37.014(985)(045)

DOI: 10.37482/issn2221-2698.2021.44.173

## Problems and Trends in the Development of Mass and Elitist Systems of General Education in the Far North \*

© Arseniy L. SINITSA, Ph.D. of Economic Sciences, Research Officer

E-mail: sinitsa@econ.msu.ru

Lomonosov Moscow State University, Moscow, Russia

**Abstract.** The Far North is the most important territory for Russia, which largely determines the pace and prospects of socio-economic development. This means that its development requires special attention. One of the main drivers for the development of the Far North is the system of general education, which meets the needs of the society and the economy of the macro region. The article considers it in two ways. First, a comparison is made between the Far North and the rest of the country of the dynamics of indicators that characterize the training of the most talented and motivated children. For this purpose, the number of winners and prize-winners of the all-Russian subject Olympiads since the academic year 2011/2012 is analyzed. It is shown that their number is significantly lower than the national average. Second, the dynamics of number of educational institutions, children attending them, and teachers working there are considered. The conclusion is made about the significant deterioration of the indicators, which is associated primarily with unfavorable demographic dynamics. The problems faced by the education system are considered and measures aimed at improving the situation are proposed. The most important of them are the concentration of efforts on the development of the mass system of general education, preparing children for work and living in rural areas, and improving the information support of the implemented policy.

**Keywords:** *the Far North, general education, all-Russian subject Olympiad, education system, educational policy.*

### Introduction

The quality of education is one of the most important issues in modern conditions, since the rate of economic progress depends on the quality of the workforce at all levels of the education system. There are special expectations of general education, as it provides the basis for higher education. The system of higher professional education only polishes what comes from lower levels and is practically unable to correct shortcomings and fill gaps in knowledge, especially if people are unwilling and unaccustomed to work. Consequently, the general education system is one of the tools of spatial development that have been much discussed recently [1, Kudryashova E.V. et al].

A quality education system has three main elements. The first one is the infrastructure that allows entering the education system at the moment when it is necessary (availability of places), is located close to the place of residence and has the necessary equipment to carry out the educational process in accordance with the current curricula. The second element is a decent salary for well-trained teachers and other personnel of educational organizations. If this requirement is not met, less talented teachers go into teaching, who are less likely to be employed elsewhere. However, the love of the profession cannot completely outweigh the low wages, since teachers have to

---

\* For citation: Sinitsa A.L. Problems and Trends in the Development of Mass and Elitist Systems of General Education in the Far North. *Arktika i Sever* [Arctic and North], 2021, no. 44, pp. 173–200. DOI: 10.37482/issn2221-2698.2021.44.173

support non-working members of their families. This applies primarily to children. The third element is the availability of educational programs that allow teaching the material in the most assimilable way, and which express the innermost attributes of individuals in the best possible way. These three elements are interrelated and the low quality of one of them negatively affects the system as a whole.

Discussions about the quality of school education in Russia and individual regions have been going on for a long time, and much has already been said [2, Krylova N.B.; 3, Chevtaeva N.G., Strebkova N.V.; 4, Shafranov-Kutsev G.F., Efimova G.Z.]. However, there are still quite a few issues that require additional study, since they are not considered in sufficient detail. First of all, they concern the achievement of formal synthetic quality assessment criteria, which are most often understood as the final USE score, the number of applicants to vocational and higher education institutions and the achievement of high places at the final stage of the All-Russian subject Olympiads.

The last indicator deserves special attention. It assesses the extent to which regional education systems are able to set and achieve ambitious goals. Nevertheless, the elite education system alone, which is associated with the education of the most talented and interested students, is not able to create a basis for the socio-economic development of the region and the country as a whole. A mass education system is also needed, that teaches the majority of children and trains and raises the human capital of the bulk of the future workforce.

### ***Research subject and method***

For these reasons, we have analysed the education system in the High North in two directions. Both of them are important and allow us to characterize the education system from our point of view.

Firstly, we consider the number of winners and prize-winners of the final stage of all-Russian subject Olympiads in the Far North regions, compare the results of students from the Far North regions with the results of students from other regions and determine the share of the Far North regions among all winners and prize-winners in general and in separate subject groups. The data source is the orders of the Ministry of Education and Science of the Russian Federation or the Ministry of Education of the Russian Federation. The period from the 2001/2012 academic year to the 2019/2020 academic year was considered. We are primarily interested in the regional distribution, so we did not conduct additional analysis by grade.

Secondly, we consider indicators that characterize the development of the general education system. The data source is the statistical bulletin "Economic and social indicators of the Far North and regions equated to it". For the period since 2000, data on the number of educational institutions, the number of children attending them and the number of teaching staff working in them have been analyzed.

By the Far North we mean the territories specified in the Decree of the USSR Council of Ministers dated November 10, 1967 No. 1029 "On the procedure for applying the Decree of the Presidium of the USSR Supreme Soviet of September 26, 1967 'On the expansion of benefits for persons working in the Far North and in the areas equated to the regions of the Far North'" and Resolution of the Council of Ministers of the USSR dated 03.01.1983 No. 12 "On amendments and additions to the List of regions of the Far North and localities equated to the regions of the Far North, approved by the Resolution of the Council of Ministers USSR dated November 10, 1967 No. 1029" (in current edition) in accordance with the administrative-territorial division of 2020. This means that we are considering all 24 regions in which there are regions of the Far North and equivalent areas. The basis is 18 regions of the Russian Federation: Arkhangelsk, Irkutsk, Magadan, Murmansk, Sakhalin, Tomsk Oblasts, the Republics of Buryatia, Karelia, Komi, Sakha (Yakutia), Tyva, Kamchatka, Krasnoyarsk, Khabarovsk Krai, Nenets, Khanty-Mansi, Chukotka, Yamalo-Nenets Autonomous Okrugs (AO). There are also six more regions with small populations in these areas: Amur, Tyumen (without Autonomous Okrugs) oblasts, the Altai Republic, Zabaykalsky, Perm, Primorsky Krai. We also consider them, but distinguish them separately.

For executive authorities, the object of management is the Arctic zone of the Russian Federation, the boundaries of which are approved by the Decree of the President of the Russian Federation dated 02.05.2014 No. 296 "On the land territories of the Arctic zone of the Russian Federation" with subsequent additions. Nevertheless, it is worth considering the larger region, which is the Far North. There are several reasons for this.

Firstly, the Far North occupies more than 70% of the country's area, and after the collapse of the USSR and the loss of western and southern territories, Russia became an even more northern country. At the same time, about 10% of the country's inhabitants live in the North, which means that it is important for development because migrants have difficulty adapting to living in such harsh natural and climatic conditions.

Secondly, most or all of the mineral and biological resources are concentrated in the Far North. Without the development of territories, it is more difficult to attract employees to develop them.

Thirdly, temporary migrants, who will be attracted in increasing numbers as the High North becomes more and more depopulated, treat the environment less carefully than permanent residents do, because they almost never consider it as their place of residence. This would have an extremely negative impact on the fragile ecosystem of the northern territories.

Fourthly, authorities and large commercial organizations are nowadays guided by the focal development of territories [5, Pilyasov A.N., Zamyatina N.Yu.]. This means that the depopulation of the Far North will continue. Whether this is consistent with the plans for the long-term development of the High North is up for debate, but we have doubts that this approach will reveal the natural, economic and social potential. Only integrated territorial development, where significant

efforts are made for social development, can slow down population decline and increase various forms of local capital.

### *Olympiad results as an indicator of quality of the Far North education system*

Currently, the Olympiads for schoolchildren are considered as an element of continuous education, which allows linking secondary and higher schools and creating conditions that are more favourable for talented youth. However, the Olympiad system covers the contingent of students unevenly. There are more participants in more economically and socially prosperous regions. The share of participants from wealthy families is higher. Meanwhile, there is no evidence that participants from less favored regions and families are less talented. As a result, their potential is not revealed, and the socializing function of the Olympiads is not used to the full extent, which negatively affects the rate of human capital accumulation of these children.

The Olympiad preparation system includes school curricula on basic and higher levels, work in the supplementary education system, time-consuming self-preparation and targeted preparation for the Olympiad by an experienced teacher. Such an integrated approach allows the selection of more prepared and motivated students. Nevertheless, involving students in the Olympiad depends not only on them, but also on the resources that the region and the family have. Their availability is an important condition for achieving high results, since the cost of training children is constantly increasing.

The key difference between the tasks of the Olympiads and ordinary school tasks is not so much their increased complexity, but their unconventional character. This means that the Olympiads is aimed less at checking the students' knowledge, but is rather a test of their personal qualities (will, self-training, ability to understand what is written and think non-standardly, behavior under stressful conditions, etc.). As modern pedagogical practice shows, the formation of these qualities is accompanied by significant difficulties [6, Zhdanova L.A., Galaktionova I.V.; 7, Krasnoshchekova S.V.; 8, Ryabinina L.A., Chaban T.Yu.]. Another disadvantage is the fragmentation of knowledge acquired at school by most students, which has to be corrected in higher education [9, Shchegoleva L.V., Svetova N.Yu., Surovtsova T.G.]. Extending the approach aimed at developing students' skills of independent thinking and correct work with the text, not only to Olympiad students, but to all students, will significantly improve the quality of learning at school.

Participation in the Olympiads provides positive social and educational results. It also serves as a form of a school-leaving examination before the Unified State Exam, helping to popularize scientific knowledge. Winning prizes at the final stage of the All-Russian School Olympiad or the Olympiad in the list of the Ministry of Education and Science gives great advantages for admission to a university or a college of higher education. However, participation in lower stages or other olympiads can also be considered an additional admission advantage. The sense of balance gained by preferring the next steps in the education system is another incentive to participate in the Olympiad.

An important positive result is the broadening of horizons. Participation in the Olympiads allows not only to gain additional knowledge on the subject and to test one's strength against others, but also to make new acquaintances and to expand social circle, as well as to see other cities and even countries.

Finally, participation in Olympiads is an important tool for overcoming one's own fears. Taking part in the Olympiad at an early stage helps to gain experience that can be used later in examinations and other stressful situations. For a discussion of why participation in Olympiads is important for students, see [10, Ekimova N.A.].

Nevertheless, the Olympiads are accompanied by a number of difficulties. Three groups of problems can be distinguished. Firstly, the Olympiad tasks differ from the USE tasks, as they are more unique and cannot be used repeatedly for the next years. Besides, tasks are worked out for the different stages of Olympiads by different groups of specialists with heterogeneous professional competence and training level. As a result, subjects and complexity of the tasks in different regions are different, which means unequal conditions for the students. Secondly, financial and material-technical capabilities of the regions differ, as a result of which there is a differentiation of the regions with respect to the procedure for financing and holding the Olympiads. Thirdly, there is no unified approach to assessing the results and training of jury members and experts. As a result, the regions differ greatly in the level of expertise, which may cause misunderstanding of the rules of Olympiad and evaluation of participants' works. A significant number of difficulties at school and municipal levels are described by E. Yu. Rivkin, who shows considerable organizational and ideological problems [11, Rivkin E.Yu.]. Finally, successful participation in Olympiads does not always mean a high quality of the education system in the region as a whole. Nevertheless, due to the positive aspects described above, the popularity of Olympiads at all levels is only increasing.

In order to minimize these disadvantages, we limit ourselves to considering only the final stage of the All-Russian subject Olympiads, which allows us to provide homogeneous approach to the Olympiads and the assessment of participants. Besides, to unify the regions, we consider the number of winners and prize-winners not per 100 thousand people, but per 100 thousand children aged 7–18 years. This allows us to eliminate differences in the age structure and to compare the regions with each other.

Are there significant differences between the educational systems of the Far North regions and the rest of the country in terms of the results of the Olympiads? The answer to this question will make it possible to assess the quality of preparation of the most motivated students.

Figure 1 shows the distribution of final stage winners of all All-Russian subject Olympiads for 2011/2012 — 2018/2019 academic years by regions of Russia. It shows certain regularities, some of which make it possible to pose the question of whether the differences between regions are related to objective or subjective factors of their development.

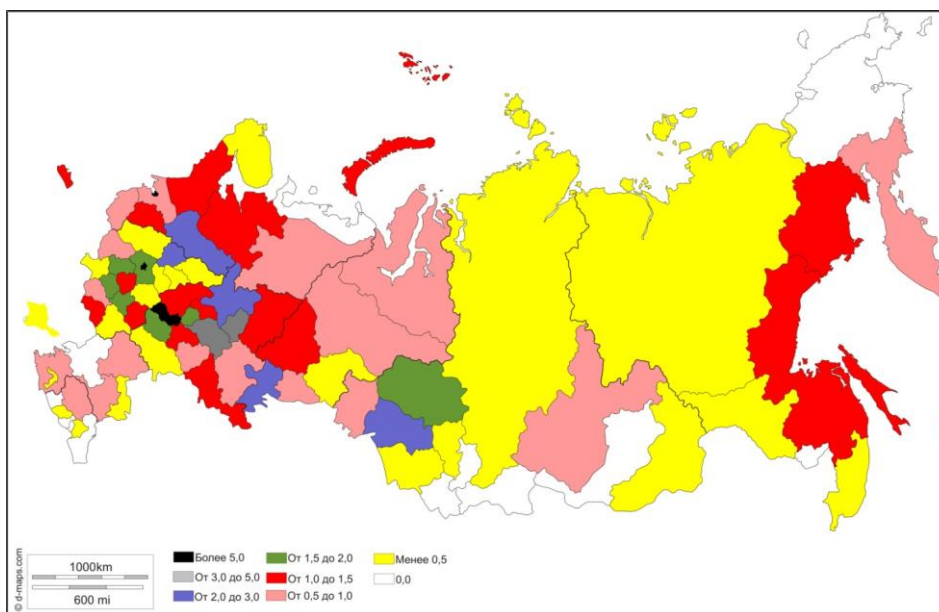


Fig. 1. Distribution of Russian regions by the number of winners of All-Russian subject Olympiads per 100 thousand children aged 7-18 years for the 2011/2012 — 2018/2019 academic years.

According to this indicator, the regions of Russia are heterogeneous, since the coefficient of variation significantly exceeds 33%. This is confirmed by considerable differences between the average and median values and applies to both the country as a whole and the distribution within federal districts. South of Russia (South and North Caucasus Federal Okrugs) is represented by the regions with the lowest number of winners among students. There are also many regions with a low number of winners in Siberia and the Far East. The Volga Federal Okrug, on the contrary, has the most regions with high values of indicators. Generally speaking, regions with smaller populations have fewer winners. In relation to the level of economic development, the relationship is less obvious. We can say not that economic indicators and economic specialization affect the number of winners, but how much the regional authorities are interested in high results, how the work to identify talented children is structured and what incentives are used for this.

The regions of the Far North showed lower results in comparison with the country as a whole. While in Russia the average number of winners was 1.8 per 100 thousand children (2.1 with the exclusion of the regions of the Far North), in the Far North it was only 0.7. This is due to the large number of regions, where the number of winners was less than four during the whole period under consideration (including those regions that had no winners at all). This group included 50% of the Far North regions (45% if we consider only 18 regions) versus 34% for the country as a whole (30% if the Far North regions are excluded). However, the statistical differences according to the Mann-Whitney criterion between the High North and the rest of the country are not significant. For 18 regions, the differences are not significant at all, while for 24 regions, the differences are also insignificant, but close to accepting the hypothesis about the significance of the differences.

In the Republics of Buryatia, Tyva, Altai, Nenets Autonomous Okrug, Chukotka Autonomous Okrug had no Olympiad winners at all. This is primarily due to the small size of the population.

Economic reasons, in our opinion, also contributed, but they are less noticeable. Thus, these regions showed the worst dynamics. Very low numbers of winners were in Amur Oblast, Zabaikalsky, Primorsky krais, where schoolchildren won only in two years out of the eight under review. High values were observed in more socially developed regions: Arkhangelsk, Tomsk Oblasts, Perm, and Khabarovsk Krai. Magadan Oblast is the only exception, and its position in this group is due to the successes of 2018–2019. The highest number of winners was observed in the Tomsk Oblast (1.7), but its value was also below the average for Russia. More than one winner per 100 thousand children aged 7–18 were in Sakhalin Oblast and the Republic of Karelia. The values were higher than the average for the Far North in Irkutsk Oblast and the Komi Republic. Among the remaining regions, the most interesting are the low values in the developed Krasnoyarsk Krai, where the number of winners turned out to be unexpectedly low.

If we consider the dynamics, we can say that the number of winners per 100 thousand children in most regions of the Far North has decreased since 2011/2012 academic year. Some growth was observed only in Arkhangelsk and Tyumen (without Autonomous Okrugs) Oblasts, the Komi Republic and Krasnoyarsk Krai. The share of 18 regions of the Far North decreased from 11.5% of the total number of all winners to 2.7%, and the share of 24 regions decreased from 15.4% to 4.3%. While the total number of winners increased, the number of winners in the Far North regions decreased.

In order to understand in which branches of knowledge the regions of the Far North had advantages, all the Olympiads were divided into four groups. The social sciences included history, social studies, law, and economics. The natural and exact sciences included astronomy, biology, geography, computer science, mathematics, physics, chemistry, and ecology. The humanities included world art culture (WAC), literature, English, Spanish, Italian, Chinese, German, Russian and French. Finally, other sciences consisted of technology, physical culture and the basics of life safety (BLS).

Over the entire period under consideration, the winners of the Olympiads from the Far North constituted 4.7% of all winners (6.5% in the analysis of 24 regions). At the same time, 18–19% of all school age children lived in the Far North (12–13%, if we consider only 18 regions). This means that the general education system in the Far North lags behind the leading regional general education systems in preparing the most gifted children.

The most noticeable successes among students from the Far North were in other disciplines. This is due to the large number of winners of the basics of life safety Olympiads from Irkutsk Oblast and the Khabarovsk Krai. They accounted for 11.9% of all winners in 18 regions and 13.3% in 24 regions. The social sciences scores were slightly above the average. The greatest contribution was made by Arkhangelsk and Irkutsk Oblasts. In total, there were 5.4% winners from these regions (7.3% taking into account 24 regions). The number of winners in natural and exact sciences was low, although this group includes a large number of academic disciplines. The number of prize-winners was low even in those regions where there are strong university schools. This

is probably due to the large number of small rural schools, where the technical base for such subjects is less developed, although schools outside the Far North face this problem as well. The share of winners from the Far North regions was 3.6% (5.4% in the analysis of 24 regions). The lowest rates, however, were for the humanities, which do not require the same significant facilities as the natural and exact sciences. Low rates are observed for all the humanities, even German language, for which higher results could be hoped for. Some regions of the Far East have achieved relatively high results in Chinese language, due to the presence of Chinese children and children from mixed families. Probably, teachers outside Moscow have less opportunities to prepare students for high-level competitions, since all regions were noticeably inferior to Moscow in language Olympiads.

Figure 2 shows the distribution of Russian regions by the number of prize-winners of the final stage of the All-Russian subject Olympiads for 2011/2012 — 2019/2020 academic years. In 2020, due to the coronavirus epidemic, all participants in the final stage became winners. This violates the established series of data, so in this paper we refer them to prize-winners rather than winners.

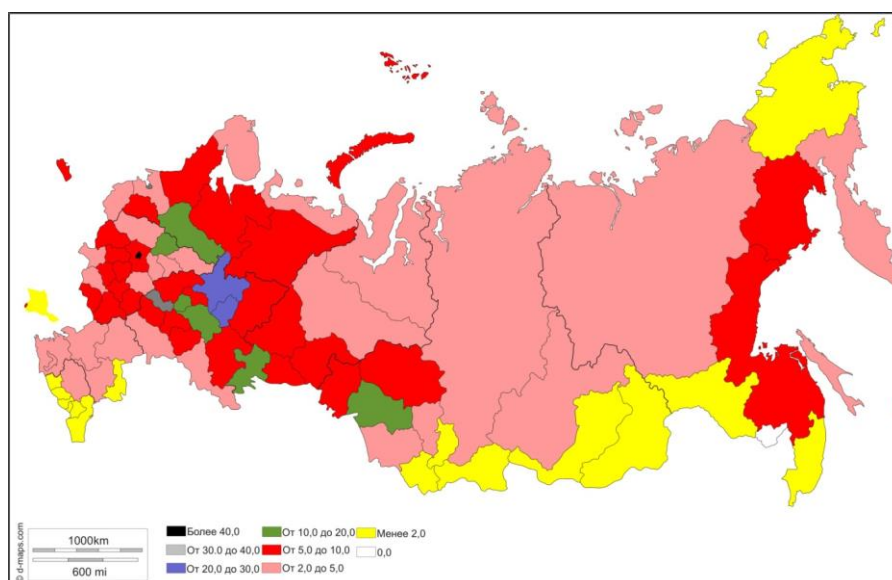


Fig. 2. Distribution of Russian regions by the number of prize-winners of All-Russian subject Olympiads per 100 thousand children aged 7–18 years for 2011/2012 — 2019/2020.

In terms of the number of prize-winners per 100 thousand children aged 7–18 years, the regions of Russia are also highly heterogeneous, since the coefficient of variation is noticeably greater than 33%, and the differences between the average and median values are large. Significant differences are observed both across the country as a whole and within the federal districts. As in the case of the winners, the lowest number of prize-winners was in the regions of southern Russia. The rest of the regions with a low number were located in the Siberian and Far Eastern Federal Okrugs. An important difference is that the prize-winners of the Olympiads were in almost all regions. The only exception is the Jewish Autonomous Oblast, which did not have a single prize-winner for the entire period starting from the 2011/2012 academic year. The Volga Federal Okrug can also be considered as a macro-region with the highest results, however, in terms of the number of prize-winners, the Central, North-West and Ural Federal okrugs showed much higher results



than in the case of the Olympiad winners. Probably, it can be argued that mass training of winners is available to a relatively small number of regional systems of general education, while due to a much larger number of winners, they appear in regions with less developed education systems.

In relation to the prize-winners of the Olympiads, the results in the Far North are worse, since in general in the macroregion their number was 4.1 against 9.0 in the country as a whole (10.1 excluding the Far North regions). A significant number of regions had less than 20 prize-winners for the entire period. Their share was 42% (39%, if we consider only 18 regions). This means that the differences between the 18 and 24 regions were slightly less noticeable. In the country as a whole, their share was 25% (18%, excluding the Far North regions). Statistical differences according to the Mann-Whitney test are also insignificant and are noticeably closer for 24 regions to the area of acceptance of the hypothesis about their significance.

The lowest number of winners was in the less developed regions of Siberia and the Far East with a high share of agriculture in the economy and the rural population. The “oil” regions (Sakhalin Oblast, Nenets Autonomous Okrug and Khanty-Mansi Autonomous Okrug), as well as Krasnoyarsk Krai, also showed low results, which is strange, given the significant financial resources at the disposal of regional authorities and a high proportion of the urban population. It can be assumed that the economic specialisation of the region and the share of the urban population have an impact, but their contribution is less significant in comparison with the development of the higher education system. Only Krasnoyarsk and Primorskiy Krai of the 14 regions with below average results had strong higher education systems. The Republic of Sakha (Yakutia) does not have a federal university, but under certain assumptions, it can also be considered to have a developed system of higher education. Among the leaders, the only exception is Magadan Oblast, which got into this group and was the leader in it due to local successes, when the results in it were at the level for Russia as a whole, but for the entire period, the number of prize-winners was significantly below the Russian average. Of the regions with high values, it is worth highlighting Kamchatka Krai, which got into this group due to the successes in 2011/2012 — 2012/2013.

If we consider the dynamics, the number of prize-winners of the Olympiads per 100 thousand children aged 7–18 years in the Far North regions in 2011/2018 — 2019/2020 has generally decreased. Nevertheless, an increase was observed in a much larger number of regions compared to the winners of the Olympiads. Therefore, their number has increased in the more economically developed Tyumen Oblast, with the exception of Yamalo-Nenets Autonomous Okrug. Regarding Irkutsk, Magadan Oblasts, the Republic of Buryatia and Zabaikalsky Krai, we can talk about an insignificant growth. An even dynamics was noted in Amur and Sakhalin Oblasts, Khabarovsk Krai and Yamalo-Nenets Autonomous Okrug. A slight decrease was noted in the Republics of Karelia and Komi. In the 2011/2012 and 2012/2013 academic years, the results of the regions of the Far North were higher than in subsequent years. The share of the Far North regions among all the prize-winners of the Olympiads decreased from 8.8% (11.8% in the analysis of 24 regions) to 4.9% (7.6%). If we limit ourselves only to the 2018/2019 academic year, when the data were compara-

ble to the 2011/2012 year, the decline will be even less: to 5.4% and 8.1%, respectively. However, with regard to prize-winners, the initial share was noticeably lower compared to winners.

For the entire period under consideration, the prize-winners of the Olympiads from the Far North regions accounted for 6.0% of all prize-winners (8.6% in the analysis of 24 regions). Consequently, the general education system in the regions of the Far North reveals the potential of a smaller number of children in comparison with other regions.

As in the case with the winners of the Olympiads, the greatest successes were achieved in other sciences. The share of winners was 11.8% (15.1% in the analysis of 24 regions). The main contribution was made by Arkhangelsk, Irkutsk, Magadan, Tomsk Oblasts, the Republic of Sakha (Yakutia), Khabarovsk Krai, Khanty-Mansi Autonomous Okrug. In this subject group, it is difficult to single out the only subject in which the Far North regions were in the lead. The distribution of regions in three other subject groups was equal and less different from the average, and there were no such noticeable differences as in the winners between them. In the humanities, the share of prize-winners was 5.3% (8.3% in 24 regions), in the social sciences — 5.0% (7.6%), in the natural and exact sciences — 5.2% (7.1 %). This confirms our thesis that additional efforts are required to prepare the Olympiad winners.

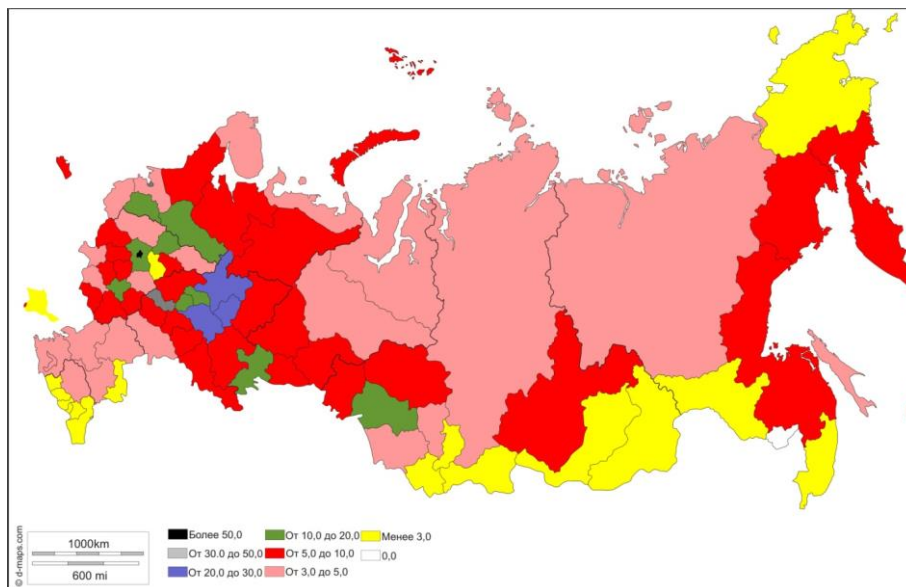


Fig. 3. Distribution of Russian regions by the number of winners and prize-winners of All-Russian subject Olympiads per 100 thousand children aged 7–18 years for 2011/2012 — 2019/2020.

Several important conclusions can be drawn from Figure 3. Firstly, Moscow stands out among all the regions. Over the entire period under consideration, the number of winners and prize-winners in this region amounted to 51.7 per 100 thousand children aged 7–18 years. Moreover, their number increased from year to year. The next two regions (the Republic of Mordovia and St. Petersburg) had much lower values: 38.7 and 36.1, respectively. These two regions also stood out noticeably, since the following are the Udmurt Republic, Kirov Oblast and the Republic of Tatarstan, the values are much lower: 26.4, 24.3 and 23.2, respectively. They are at the bottom of the leading group. They are followed by the Chuvash Republic with a value of 15.9 and all other regions, which are further distributed without such significant gaps.

Secondly, among the regions of the Far North, the highest values (10.0) were in one of the least developed regions —Magadan Oblast. Nevertheless, it was still below the national average of 10.8 (12.2 when excluding the regions of the Far North from consideration). Values above the average for the Far North (4.8) were in more economically and socially developed regions or in regions located in the European part of Russia.

Thirdly, the leading regions are not necessarily the most financially secured and have a higher-income financial specialization: the desire of the regional leaders to achieve high performance is a much more important factor, since this, more accurately, ensures better work with children and the development of their abilities. The lowest results were shown by the regions of the South of Russia, Siberia and the Far East. They have many poor agricultural regions, but there are also many regions with extractive specialization, which have a large amount of material resources. In regions with a large share of the rural population, the results are lower, but in many regions with a high share of the urban population, they are also worse than the national average. In regions with a more developed system of higher education, the results are better, but this does not guarantee high results as, for example, in Krasnoyarsk Krai. Natural and climatic conditions are important, but also not a decisive factor. It can be assumed that the remoteness of settlements from each other and other factors, which can be estimated by spatial autocorrelation indices, are important. However, we have serious doubts about their significance for the country as a whole, although they may well be significant for the regions of the Far North.

The group of leading regions is also heterogeneous. It includes both very developed regions, which are financial, industrial and scientific centers, and regions with agricultural specialisation and a small amount of available financial resources. They are united by the fact that all of them (with the exception of Novosibirsk and Chelyabinsk Oblasts) are located in the Central, North-West and Volga Federal Okrugs. There is also not a single least developed region among them.

It can be assumed that of all the factors, the most important is the political will of the regional authorities and their desire to have a large number of winners and prize-winners of the final stage of the All-Russian subject Olympiads. As for the rest of the factors, it is difficult to single out one factor that could have a decisive influence, and we should talk about a complex of factors of socio-economic development that determine the interregional differences.

The number of winners and prize-winners of the Olympiads is influenced by the general trends in the development of general and additional education. Without schools setting high goals and a wide offer of extra-curricular activities, it is impossible to achieve high results. However, the development of the general education system plays a very important role, since it is difficult to achieve high results without the necessary basis.

**Trends and problems in the development of the general education system in the Far North**

Table 1 shows the dynamics of the number of educational institutions in the Far North and equivalent areas since the 2000/2001 academic year. We are not considering the entire region, but only the part that belongs to the Far North, but in most regions (except for six ones, considered separately), the conclusions will be valid for the entire region as a whole.

*Table 1*

*Dynamics of the number of state and municipal educational institutions in the Far North in 2000/2001 — 2018/2019 academic years<sup>1</sup>*

	2005 to 2000	2010 to 2005	2015 to 2010	2016 to 2015	2017 to 2016	2018 to 2017	2018 to 2015	2018 to 2000
Altai Republic	100.0	100.0	88.9	100.0	100.0	100.0	100.0	88.9
Republic of Buryatia	89.0	80.2	93.8	96.7	105.1	98.4	100.0	67.0
Republic of Karelia	86.2	83.6	93.0	99.1	96.7	99.0	94.9	63.6
Komi Republic	88.6	83.2	84.3	96.9	98.6	97.4	93.0	57.8
Republic of Sakha (Yakutia)	97.3	93.9	97.5	100.0	99.2	100.0	99.2	88.4
Tyva Republic	102.9	98.3	98.3	100.0	101.2	100.0	101.2	100.6
Zabaykalsky Krai	73.3	90.9	95.0	100.0	89.5	94.1	84.2	53.3
Kamchatka Krai	93.5	93.8	94.2	100.0	101.8	100.0	101.8	84.1
Krasnoyarsk Krai	93.3	75.5	96.7	98.5	100.0	99.0	97.5	66.4
Perm Krai	69.9	62.7	96.9	100.0	93.5	86.2	80.6	34.2
Primorskiy Krai	84.1	91.4	94.3	86.0	100.0	95.3	82.0	59.4
Khabarovsk Krai	93.1	88.3	94.1	99.5	101.0	100.5	101.0	78.2
Amurskaya Oblast	97.1	86.8	84.7	102.0	100.0	100.0	102.0	72.9
Arkhangelsk Oblast (without AO)	69.9	86.2	84.5	99.1	97.7	91.1	88.2	44.9
Nenets Autonomous Okrug	100.0	88.4	97.4	94.6	80.0	92.9	70.3	60.5
Irkutsk Oblast	96.2	93.7	84.1	100.0	100.0	98.0	98.0	74.3
Magadan Oblast	89.9	90.1	93.8	96.7	98.3	100.0	95.0	72.2
Murmansk Oblast	90.7	83.0	88.7	98.8	100.0	99.4	98.2	65.6
Sakhalin Oblast	88.6	89.3	94.6	98.7	98.7	100.0	97.5	73.0
Tomsk Oblast	81.9	88.3	86.1	98.4	95.9	95.7	90.3	56.3
Tyumen Oblast (without AO)	57.7	93.3	14.3	700.0	35.7	100.0	250.0	19.2
Khanty-Mansi Autonomous Okrug	94.3	94.5	88.6	101.9	98.8	98.4	99.1	78.2
Yamalo-Nenets Autonomous District	94.2	91.8	96.3	90.0	109.4	100.0	98.5	82.1
Chukotka Autonomous Okrug	87.5	85.7	97.6	102.4	100.0	97.6	100.0	73.2
Far North	88.8	88.2	91.0	99.1	99.0	98.8	97.0	69.2

During the period under review, the number of general education institutions increased only in the Republic of Tuva. If not for the closure of three schools in the 2011/2012 academic year, then in the Altai Republic it would have been possible to keep their number unchanged. A low decline was noted in the Republic of Sakha (Yakutia). Yamalo-Nenets Autonomous Okrug and Kamchatka Krai lagged behind them. In other regions, the number of educational institutions decreased by more than 20%.

If we exclude Tyumen Oblast with a small number of educational institutions in the Far North, which leads to significant fluctuations, the lowest retention was noted in Perm Krai, alt-

<sup>1</sup> Source: The number of state and municipal educational organizations (excluding evening (shift) general educational organizations). URL: [https://rosstat.gov.ru/bgd/regl/b19\\_22/IssWWW.exe/Stg/04-03.doc](https://rosstat.gov.ru/bgd/regl/b19_22/IssWWW.exe/Stg/04-03.doc) (accessed 15 January 2021). The number of state and municipal educational organizations (excluding evening (shift) general educational organizations). URL: [https://rosstat.gov.ru/bgd/regl/b16\\_22/IssWWW.exe/Stg/04-03.doc](https://rosstat.gov.ru/bgd/regl/b16_22/IssWWW.exe/Stg/04-03.doc) (accessed 15 January 2021).

though the number of organizations in this region located in the Far North was also small. Of the regions with a large number of educational institutions, Arkhangelsk Oblast should be singled out, where the reduction was more than 50%. More than 40% of the initial number was lost by Tomsk Oblast, the Komi Republic, Zabaikalsky and Primorskiy Krai.

Both groups included both more and less financially secured regions. Therefore, we can assume that the dynamics of the number of general education institutions was influenced primarily by demographic dynamics. The dynamics of the number of settlements also contributed, since in the conditions of the Far North, many schools are rural. The geographical factor also played a certain role, since in all regions of the European part the decline was higher than the average value for the Far North.

After 2010, the rate of decline in the number of educational institutions in the regions of the Far North has slowed down, but there are some exceptions (Zabaikalsky Krai, Nenets Autonomous Okrug). Moreover, in some regions there was an increase in their number (Amur Oblast, the Republic of Buryatia, Khabarovsk Krai). Nevertheless, the process of reducing the network of educational institutions continues, and there are no reasons to change the trend.

In the conditions of the Far North, the educational institutions are the cultural centres of the settlements [12, Cost D.S.; 13, Herrmann V.]<sup>2</sup>, therefore, further closure of general education organizations will lead to further depopulation of the Far North regions. If the state plans the integrated development of these territories, measures are needed to preserve schools, especially small ones, and to improve the quality of education there.

The dynamics of number of children at school age has already been considered by us [14, Sinitsa A.V.], therefore, table 2 shows the dynamics of the number of students of general education organizations. As in the case of table 1, we limited ourselves to the Far North and equivalent areas.

Table 2

*Dynamics of the number of students in state and municipal educational institutions in the Far North in 2000/2001 — 2018/2019 academic years*<sup>3</sup>

	2005 to 2000	2010 to 2005	2015 to 2010	2016 to 2015	2017 to 2016	2018 to 2017	2019 to 2018	2019 to 2000	2019 to 2000
Altai Republic	85.9	85.2	103.8	103.7	103.6	103.4	105.0	116.7	88.7
Republic of Buryatia	71.1	80.6	97.2	99.3	101.5	99.3	99.3	99.3	55.3
Republic of Karelia	68.6	84.8	103.2	102.9	102.1	101.6	101.0	107.8	64.7

<sup>2</sup> See also: Neustroev N.D., Neustroeva A.N., Sakerdonova A.S., Sleptsov Y.A., Rufov V.A. Small schools as a sociocultural center in rural settlements of the North-East of Russia: Search for the ways to preserve and develop. *Espacios*. 2018, vol. 39, no. 23, p. 16. URL: <https://www.revistaespacios.com/a18v39n23/a18v39n23p16.pdf> (accessed 15 January 2021).

<sup>3</sup> Source: The number of students in state and municipal educational institutions (excluding evening (shift) general educational institutions). URL: [https://rosstat.gov.ru/bgd/regl/b19\\_22/IssWWW.exe/Stg/04-06.doc](https://rosstat.gov.ru/bgd/regl/b19_22/IssWWW.exe/Stg/04-06.doc) (accessed 15 January 2021). The number of students in state and municipal educational institutions (excluding evening (shift) general educational institutions). URL: [https://rosstat.gov.ru/bgd/regl/b20\\_22/IssWWW.exe/Stg/04-04.docx](https://rosstat.gov.ru/bgd/regl/b20_22/IssWWW.exe/Stg/04-04.docx) (accessed 15 January 2021). The number of students in state and municipal educational institutions (excluding evening (shift) general educational institutions). URL: [https://rosstat.gov.ru/bgd/regl/b16\\_22/IssWWW.exe/Stg/04-06.doc](https://rosstat.gov.ru/bgd/regl/b16_22/IssWWW.exe/Stg/04-06.doc) (accessed 15 January 2021).

Komi Republic	70.3	81.4	101.2	102.1	101.1	100.6	100.2	104.1	60.4
Republic of Sakha (Yakutia)	86.0	86.4	98.8	102.0	102.2	101.8	101.2	107.5	78.8
Tuva Republic	89.1	88.9	107.0	104.3	105.4	104.2	102.5	117.5	99.6
Zabaykalsky Krai	70.0	85.7	93.3	100.0	100.0	100.0	96.4	96.4	54.0
Kamchatka Krai	74.0	87.5	104.0	100.9	102.6	101.4	100.8	105.8	71.3
Krasnoyarsk Krai	74.8	81.9	101.5	103.0	101.2	101.2	100.0	105.5	65.6
Perm Krai	72.6	86.8	87.0	97.5	100.0	94.9	97.3	90.0	49.3
Primorskiy Krai	69.3	81.9	99.1	69.6	98.7	98.7	97.4	66.1	37.2
Khabarovsk Krai	68.2	82.1	99.6	102.0	102.6	101.0	99.8	105.5	58.9
Amurskaya Oblast	70.0	83.4	96.7	101.7	100.8	99.2	99.2	100.9	57.0
Arkhangelsk Oblast (without AO)	67.8	87.2	104.5	102.7	101.9	100.7	95.5	100.6	62.1
Nenets Autonomous Okrug	81.1	95.0	105.3	103.3	101.6	101.6	98.4	105.0	85.1
Irkutsk Oblast	69.7	82.7	98.3	104.3	102.5	100.4	100.1	107.5	60.9
Magadan Oblast	65.4	82.5	103.2	100.6	100.6	100.0	99.4	100.6	56.1
Murmansk Oblast	66.1	82.4	102.4	101.2	103.1	101.1	100.9	106.4	59.3
Sakhalin Oblast	70.4	85.5	113.2	99.3	102.5	101.6	101.9	105.4	71.7
Tomsk Oblast	70.5	82.5	99.6	101.6	102.4	99.2	100.8	104.1	60.3
Tyumen Oblast (without AO)	65.1	85.7	12.5	900.0	103.7	103.6	103.4	1000.0	69.8
Khanty-Mansi Autonomous Okrug	76.9	92.4	111.7	103.8	103.7	103.0	103.0	114.2	90.7
Yamalo-Nenets Autonomous District	83.7	87.5	102.0	102.0	102.4	101.1	102.4	108.2	80.8
Chukotka Autonomous Okrug	73.8	93.4	102.8	102.7	100.0	98.7	100.0	101.4	71.8
Far North	73.7	85.8	103.4	102.3	102.5	101.5	101.2	107.7	70.4

During the period under review, the number of children studying in general education institutions decreased in all Far North regions. The smallest decline was in the Republic of Tuva. It was followed by the Altai Republic, Nenets Autonomous Okrug and Khanty-Mansi Autonomous Okrug, which are regions with high birth rates by Russian standards. Excluding Yamalo-Nenets Autonomous Okrug, all the other regions had a decline of more than 20%.

The regions with the greatest decline are those with different combinations of low birth rates and high migration outflows. In general, the link between birth rates and school closures is confirmed, but not always a direct one. For example, Arkhangelsk Oblast was a leader in the closure of general education institutions, but the decline in the number of students was much smaller. It is necessary to consider each region in more detail and analyze how the decline in the birth rate affected the process of optimizing the network of general education organisations, which is much better done by local experts who have access to municipal statistics.

Regions with smaller populations have had higher birth rates and, consequently, higher enrolment rates. This is due to the presence of a higher share of indigenous peoples of the North. With the exception of Nenets Autonomous Okrug, all of them are located in the Asian part. Regions with the greatest decline are also located there, but still the decline was higher in the European part, since all other regions of this part had a decline above the average in the Far North.

The number of students directly depends on the previous birth rate; therefore, until the 2005/2006 academic year, their number was decreasing. The decline has also continued to a lesser extent in the following years. From the 2010/2011 academic year, the number of

students in most regions began to increase. There are, however, a significant number of exceptions. Since the 2015/2016 academic year, a steady downward trend in the number of students has remained only in the Republic of Buryatia, Zabaikalsky, Perm and Primorsky Krai, that is, in the regions with the largest total decline over the entire period. The increase in the number of students will continue until about 2025, after which, due to the wave-like population dynamics, the regions of the Far North will again face a sharp and strong reduction in their number.

Table 3 shows the dynamics of the number of teaching staff in the Far North and equivalent areas. Our attention is focused on it, because this category is broader than just the category of teachers.

Table 3

*Dynamics of the number of teaching staff in state and municipal educational institutions in the Far North in 2000/2001 – 2018/2019 academic years*<sup>4</sup>

	2005 to 2000	2010 to 2005	2015 to 2010	2016 to 2015	2017 to 2016	2018 to 2017	2019 to 2018	2019 to 2000	2019 to 2000
Altai Republic	128.6	77.8	114.3	100.0	100.0	100.0	100.0	100.0	114.3
Republic of Buryatia	90.5	68.4	84.6	100.0	100.0	100.0	100.0	100.0	52.4
Republic of Karelia	82.1	73.1	119.3	95.6	98.5	100.0	98.4	92.6	66.3
Komi Republic	84.4	87.7	93.0	101.1	100.0	96.8	97.8	95.7	65.9
Republic of Sakha (Yakutia)	103.1	74.1	118.1	101.1	101.1	100.6	100.0	102.8	92.8
Tyva Republic	100.0	87.1	118.5	103.1	100.0	101.5	103.0	107.8	111.3
Zabaykalsky Krai	100.0	100.0	75.0	100.0	100.0	100.0	100.0	100.0	75.0
Kamchatka Krai	85.4	71.4	136.0	97.1	100.0	103.0	105.9	105.9	87.8
Krasnoyarsk Krai	88.8	62.0	122.7	100.0	100.0	101.9	98.2	100.0	67.5
Perm Krai	87.5	71.4	140.0	85.7	100.0	100.0	100.0	85.7	75.0
Primorskiy Krai	72.2	76.9	90.0	77.8	100.0	100.0	100.0	77.8	38.9
Khabarovsk Krai	80.8	72.9	114.0	102.0	100.0	100.0	102.0	104.1	69.9
Amurskaya Oblast	88.9	68.8	109.1	91.7	109.1	100.0	100.0	100.0	66.7
Arkhangelsk Oblast (without AO)	85.3	73.7	130.6	98.4	98.4	98.4	93.4	89.1	73.1
Nenets Autonomous Okrug	87.5	114.3	100.0	87.5	114.3	87.5	100.0	87.5	87.5
Irkutsk Oblast	85.2	69.3	98.1	105.9	96.3	100.0	98.1	100.0	58.0
Magadan Oblast	77.3	82.4	92.9	100.0	100.0	100.0	100.0	100.0	59.1
Murmansk Oblast	77.5	69.6	107.3	98.3	101.7	100.0	100.0	100.0	57.8
Sakhalin Oblast	77.8	73.5	119.4	100.0	97.7	104.8	104.5	107.0	73.0
Tomsk Oblast	80.5	84.8	89.3	100.0	100.0	100.0	100.0	100.0	61.0
Tyumen Oblast (without AO)	25.0	100.0	30.0	666.7	100.0	150.0	100.0	1000.0	75.0
Khanty-Mansi Autonomous Okrug	87.0	76.6	124.2	101.9	101.9	101.8	101.2	106.9	88.5
Yamalo-Nenets Autonomous District	93.2	71.0	128.6	101.6	101.6	101.5	101.5	106.3	90.5
Chukotka Autonomous Okrug	100.0	66.7	150.0	100.0	100.0	100.0	100.0	100.0	100.0
Far North	87.5	75.4	114.5	100.3	100.3	100.4	100.3	101.3	76.6

<sup>4</sup> Source: The number of teaching staff of state and municipal educational institutions (excluding evening (shift) general educational institutions). URL: [https://rosstat.gov.ru/bgd/regl/b20\\_22/IssWWW.exe/Stg/04-02.docx](https://rosstat.gov.ru/bgd/regl/b20_22/IssWWW.exe/Stg/04-02.docx) (accessed 15 January 2021). The number of teaching staff of state and municipal educational institutions (excluding evening (shift) general educational institutions). URL: [https://rosstat.gov.ru/bgd/regl/b16\\_22/IssWWW.exe/Stg/04-04.doc](https://rosstat.gov.ru/bgd/regl/b16_22/IssWWW.exe/Stg/04-04.doc) (accessed 15 January 2021).

During the period under review, the number of teaching staff decreased in 21 out of 24 regions of the Far North. In the Altai and Tyva Republics, the increase in their number can be associated with an increase or a slight decrease in the number of general education institutions and a high birth rate. In Chukotka Autonomous Okrug, the growth is probably associated with the adaptation of the educational system after the huge migration outflow in the 1990s. A relatively slight decrease was observed in the more economically prosperous the Republic of Sakha (Yakutia), Khanty-Mansi Autonomous Okrug and Yamalo-Nenets Autonomous Okrug. The list of regions with the largest decrease (over 40%) is similar to the previous one: Irkutsk, Magadan Oblasts, the Republic of Buryatia, Primorsky Krai. This group also included Murmansk Oblast, which had low results in previous cases, but not low enough to be included in a similar group. We can see that, despite some exceptions, the dynamics of the number of teaching staff is determined mainly by the dynamics of the birth rate and the number of educational institutions. Geographically, the features are similar to those of the number of educational organisations.

Of all the indicators under consideration, the number of teaching staff is characterized by the most contradictory dynamics. According to the enlarged time intervals, a decrease during each of them was observed only in the Komi Republic and Primorskiy Krai. In the 2000s, most regions had a decline, although in some regions local authorities were able to maintain (Zabaikalsky Krai, Chukotka Autonomous Okrug) or even increase (the Altai Republics, the Republic of Sakha (Yakutia), Nenets Autonomous Okrug) their number. In the 2010s, growth was observed in most regions, which followed the increase in fertility, but in all regions in which there was a decrease in the number of teaching staff in the 2015/2016 — 2019/2020 academic years (with the exception of the Republics of Karelia and Komi), it was more than 10%. In general, the decline in the Far North was about 25%, which is slightly lower than the total reduction in the number of general education organisations and children studying in them. This is probably due to the dynamics of the provision of teachers in rural small schools.

For a more complete description of the existing trends, it is necessary to describe the dynamics of salaries of pedagogical staff. We will not go into this question because it is discussed in detail in [15, Karaseva L.A., Okhrimenko A.O.; 16, Sinitsa A.L.; 17, Sinitsa A.L.; 18, Sinitsa A.L.].

The network of educational organisations in the Far North regions is facing a number of problems that determine the dynamics presented above. They can be divided into common for the whole country (closure of incomplete schools, a decrease in the number of students, a shortage of personnel, etc.) and specific to the regions of the Far North. Let us review the most important of them through the prism of the general education system in the Far North.

An important problem is physical accessibility of general education institutions. For example, in the Republic of Sakha (Yakutia), the average distance to the nearest school was 30.6 km. In the 2006/2007 academic year, 173 schools (26% of the total number) were located in places connected to the nearest settlement with a winter road or air/water ways [19, Gabysheva F.V., p. 55] (in the country as a whole, the average radius of accessibility of rural schools from



1990 to 2014 increased from 12.6 km to 17.3 km [20, Bondarenko L.V., p. 77]). The situation is better in the regions with less severe climatic conditions and higher population density, but even in these regions the long distances are an important factor limiting the development of the network of educational institutions, especially in the settlements remote from the centres of the region and transport routes.

At present, the problem of staffing has not been resolved. Remoteness means weak socio-economic infrastructure and low wages, as well as difficulties in employing teacher's family members. As a result, there is a shortage of staff, and many specialists teach several subjects, which almost always means less immersion of children in the material. In particular, there is a shortage of young teachers who are not ready to work in such conditions [21, Afanasyeva L.I., Porotova N.A.; 22, Kozhurova A.A., Safonova D.V.; 23, Martynenko O.O., et al.].

In conditions of remoteness, the quality of education largely depends on the technical maintenance of buildings and the provision of equipment and books for lessons. Most rural municipalities in the High North do not have sufficient resources to deal with this problem.

An important feature that must be taken into account is the shift in the teaching schedule due to the migration activity of students during the holidays. Climatic conditions mean that, due to illness and weather conditions, children often do not attend school, and a considerable amount of material is given to them remotely and for self-study. Natural conditions have a negative impact on the ability of students and teachers to work. It is also not always possible to explain certain phenomena to children, because in the conditions of the Far North they may not occur (for example, flowering of gardens). These specific problems cannot be completely eliminated; but it is possible to try to mitigate their negative effects.

Currently, the prestige of physical labor is low. For this reason, and due to the poor development of agroeconomics in rural areas after the collapse of the collective farm system, labor education of agrotechnical, forestry, environmental or other profile, which provides useful skills and knowledge for life in rural areas, is poorly represented [24, Eflova Z.B.]. This is one of the reasons for the outflow of the population, since the school cannot interest children in hard rural work, does not provide appropriate skills and does not prepare students for life and professional work in their small homeland.

Apart from problems common for the whole country and specific to the Far North, there are problems related to education of indigenous peoples of the North. Schools are not always able to meet the needs of people and to provide the education that would allow the indigenous peoples to integrate into the modern society. If they succeed in doing this, then they largely lose their national identity. These features are described in sufficient detail in [25, Balashov Yu.V.; 26, Indenbaum E.L.; 27, Sinitsa A.L.]. It should only be noted that significant financial costs are not required to eliminate most of the problems.

It is worth mentioning that difficulties with the development of the education system in rural or remote settlements are not a specific to Russia. Children from rural areas in foreign

countries are less likely to receive a complete secondary education<sup>5</sup>. This is especially noticeable in relation to the indigenous peoples of the North, whose education system requires additional financial resources [28, Doyle A., Kleinfeld J., Reyes M.], and whose educational level is lower [29, Bania E.V., Eckhoff C., Kvernmo S.]. The deep problems in the development of general education in the United States are described in great detail in the fundamental monograph by J. Goodlad [30, Goodlad J.], which shows that they apply to many other countries.

### *Recommendations for education system development*

Due to large interregional differences, some authors argue that it is impossible to create a unified change management system and that only a general framework regulation is needed [31, Kasprzhak A.G., Bysik N.V.]. This means that for the Far North and equivalent areas, solutions that take into account the specifics of their educational systems are needed. Another important condition for the development of local education systems is participation of the local community itself, i.e. the presence of high social capital [32, Galindabaeva V.V., Karbainov N.I.].

With considerable distances between settlements and a large number of small rural schools and not always high living standards, in our opinion, betting on increasing the number of winners and prize-winners of the subject Olympiads, is wrong, because significant resources are spent on students' preparation, but they move to other regions to enter the universities. Consequently, there is a "brain drain", which is irrevocable, since almost all of these children, after graduation from the university, stay in the new place of residence. From a long-term strategy point of view, a much better approach is to develop the education system in such a way as to increase the average USE score. This will improve the quality of the incoming flow of applicants to local universities, whose activities are largely aimed at developing the regions of the Far North and equivalent areas and will favorably affect the development of these territories, and will allow to obtain more noticeable results on the final stage of the All-Russian subject Olympiads in the long term. This approach will also help to slow down the outflow of the population, since the poor quality of mass schooling is a significant reason for a change of residence.

It may be tempting to use the experience of some regions. There, the overwhelming majority of winners and awardees are in the same general education system, and they receive special support. This allows children to develop and show great success at the Olympiads. However, in this case, the educational system does not work for the alignment of the results, but for their concentration. Consequently, indicators of other secondary schools are worse, since the most talented children are withdrawn from them, and, as a result, their financing is worse, which is a great negative impetus that affects all the regional system of general education. It is necessary to develop it comprehensively and evenly, avoiding such distortions that hinder this process.

---

<sup>5</sup> Bania E.V., Lydersen S., Kvernmo S. Non-completion of upper secondary school among female and male young adults in an Arctic sociocultural context; the NAAHS study. BMC Public Health. 2016, 16 (960). URL: <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-016-3644-2> (accessed 15 January 2021). DOI: 10.1186/s12889-016-3644-2

The major difference between elite and mass general education is less about the quality of the curriculum. It is necessary to strengthen those components of schooling that are aimed at developing children's ability to think independently, understand what has been written, evaluate it critically and argue for their point of view, as well as develop the desire for self-education within and beyond the school curriculum. These skills are essential not only in later stages of the education system, but also in everyday life. The need to improve the quality of these components applies to all schools, but it is especially important for the Far North, as it would allow the development of these areas more diversified, reducing the share of the mining sector and increasing the sustainability of socio-economic development. Improving these skills will contribute to a fuller and better knowledge of the school curriculum.

It is also important for schools in the Far North to return labour education to the curriculum in order to give children real life skills. Perhaps, such schools need other, not massive, unified criteria for assessing the quality of education. It is also important for them to have material support from regional and municipal authorities and support the efforts of schools to have the proceeds from the sale of their products as an additional source of funding. The examples suggest that there is a demand for agricultural and other schools with a similar profile [33, Bozhedonova Z.N.; 34, Nemirich T.N.].

In conditions of dispersed settlement and poor transport accessibility, schools in the Far North, which are often the only state institutions involved in cultural and educational activities for both children and adults, are in great need of high-speed Internet. First of all, this concerns rural schools, since children and teachers often lack access to modern and more advanced knowledge, which greatly limits development and reduces the quality of education. In rural schools, the cost of educating children is higher than in urban ones, and in small schools, it is even higher. Nevertheless, it is necessary to provide Internet access to every general education organisation.

It is necessary to strengthen the information support of the current policy, which can be supported by international experience. This requires research to determine the problems facing the education system more comprehensively. It is particularly important for rural areas, because the education system does not prepare for rural life and abroad [35, Bæck U.-D.K.]. Such studies are usually conducted on sufficiently large samples to be representative, if not for the whole country, then at least for the northern territories <sup>6</sup> [29, Bania E.V., Eckhoff C., Kvernmo S.].

A number of other measures can also be identified. As additional support measures for rural teachers, it may be proposed to provide young specialists who plan to work in rural areas with a set of equipment at the expense of the regional budget. It may include, for example, a laptop

---

<sup>6</sup> See also: Bania E.V., Lydersen S., Kvernmo S. Non-completion of upper secondary school among female and male young adults in an Arctic sociocultural context; the NAAHS study. *BMC Public Health*. 2016, 16 (960). URL: <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-016-3644-2> (accessed 15 January 2021). DOI: 10.1186/s12889-016-3644-2; Rapp S., Aktas V., Ståhlkrantz, K. Schoolboards' expectations of the superintendent – a Swedish national survey. *Educational Review*. N.d. URL: <https://www.tandfonline.com/doi/full/10.1080/00131911.2020.1837740> (accessed 15 January 2021). DOI: 10.1080/00131911.2020.1837740

and a projector. In regional institutes for advanced training and retraining of educators, a subdivision is needed that would work only with rural schools. It is also necessary to organise regular advanced training on issues that are relevant for the teacher themselves, not only within the framework of the subjects they read, but also in psychology and pedagogy. This is especially important for young teachers. More active involvement of children in research activities is needed. This will require additional funding, but will improve the quality of education and provide new data that will be based on long-term observations. This experience has been implemented abroad [36, Klene A.E., et al.].

Finally, it is necessary to develop the general education system in order to minimize the negative impact on children's health. It has been noted in publications that the already poor health of children at school age in the regions of the Far North is even worse [37, Buzinov R.V., Amerina E.A., Unguryanu T.N.]. The school could have a positive effect on the shortcomings of family education, but it faces problems that negatively affect the health of children, and, therefore, their academic performance [37, Buzinov R.V., Amerina E.A., Unguryanu T.N.; 38, Shemetova E.V., Boytsova T.M.]. It is therefore necessary to make efforts on the part of the federal and regional authorities to enable the institution to become a centre of health promotion [39, Ulanova S.A.], which is especially important in conditions of dispersed settlement of the Far North, and to develop and implement an appropriate long-term state policy.

### ***Acknowledgments and funding***

The work was prepared within the RFBR grant No. 19-010-00867 A "Education system in the Far North regions: current state, problems and prospects for development and modernization".

### ***References***

1. Kudryashova E.V., Lipina S.A., Zaikov K.S., Bocharova L.K., Lipina A.V., Kuprikov M.Yu., Kuprikov N.M. Arctic Zone of the Russian Federation: Development Problems and New Management Philosophy. *The Polar Journal*, 2019, vol. 9, no. 2, pp. 445–458. DOI: 10.1080/2154896X.2019.1685173
2. Krylova N.B. Shkol'nyy uklad — kakoe kachestvo obrazovaniya my sozdaem? [School Life — What Quality of Education Do We Create?]. *Narodnoe obrazovanie* [National Education], 2010, no. 6, pp. 33–37.
3. Chevtaeva N.G., Strebkova N.V. Otsenka kachestva shkol'nogo obrazovaniya: sotsiologicheskii analiz grupp interesov [Evaluation of the Quality of School Education: Sociological Analysis of Interest-Groups]. *Monitoring obshchestvennogo mneniya: ekonomicheskie i sotsial'nye peremeny* [The Russian Public Opinion Monitor: Economic and Social Changes], 2011, no. 2 (102), pp. 143–162.
4. Shafranov-Kutsev G.F., Efimova G.Z. Spetsifika zhizni i pedagogicheskoy deyatel'nosti na Kraynem Severe (na primere Yamalo-Nenetskogo avtonomnogo okruga) [Specifics of Life and Pedagogical Activity in the Far North (in terms of the Yamal-Nenets Autonomous District)]. *Arktika i Sever* [Arctic and North], 2017, no. 26, pp. 136–150. DOI: 10.17238/issn2221-2698.2017.26.136

5. Pilyasov A.N., Zamyatina N.Yu. Osvoenie Severa 2.0: vyzovy formirovaniya novoy teorii [Development of the North 2.0: Challenges of Making a New Theory]. *Arktika i Sever* [Arctic and North], 2019, no. 34, pp. 57–76.
6. Zhdanova L.A., Galaktionova I.V. Olimpiada v MGU: gde zhe proiskhodit «razryv» mezhdru shkoly i vuzom? [Olympiad at Moscow State University: Where is the “Gap” Between School and University?]. Nizhny Novgorod, National Research Nizhny Novgorod State University named after N.I. Lobachevsky, 2002, pp. 92–93.
7. Krasnoshchekova S.V. Rezul'taty longityudnogo issledovaniya soprovozhdeniya vvedeniya FGOS osnovnogo obshchego obrazovaniya na primere matematiki (opyt Khabarovskogo kraja) [Results of a Longitudinal Study of Support for the Introduction of the Federal State Educational Standard for Basic General Education on the Example of Mathematics (the Experience of the Khabarovsk Territory)]. Chelyabinsk, Regional Center for Assessing the Quality and Informatization of Education, 2018, pp. 33–42.
8. Ryabinina L.A., Chaban T.Yu. Monitoring chitatel'skoy gramotnosti: regional'nyy opyt [Monitoring of Reading Literacy: Regional Experience]. *Otechestvennaya i zarubezhnaya pedagogika*, 2019, vol. 1, no. 4 (61), pp. 236–247.
9. Shchegoleva L.V., Svetova N.Yu., Surovtsova T.G. Vliyanie rezul'tatov itogovoy attestatsii vypusknikov shkol na uspeshnost' obucheniya v vuze na primere Respubliki Kareliya [Final State Examination of Pupils' Academic Achievement and Students' Academic Performance in Higher Educational Institutions in the Republic of Karelia]. *Nepreryvnoe obrazovanie XXI vek* [Lifelong Education: the XXI Century], 2018, no. 3 (23), pp. 27–39.
10. Ekimova N.A. Otsenka effektivnosti shkol'nogo obrazovaniya na osnove dannykh obshcherossiyskikh olimpiad [Performance Evaluation of School Education Based All-Russian Olympiad]. *Ekonomika obrazovaniya* [Economics of Education], 2014, no. 1, pp. 33–47.
11. Rivkin E.Yu. Vserossiyskaya olimpiada shkol'nikov: problemy i vozmozhnosti [All-Russian Olympiad of School Students: Challenges and Opportunities]. *Obrazovatel'naya politika* [Educational Policy], 2015, no. 4 (70), pp. 89–94.
12. Cost D.S. The Role of Public Education in Governance for Resilience in a Rapidly Changing Arctic. *Ecology and Society*, 2015, vol. 20, no. 3, p. 29. DOI: 10.5751/ES-07757-200329
13. Herrmann V. Investing in Community: Conceptualizing Inclusive School Design for America's Arctic. *Polar Geography*, 2016, vol. 39, no. 4, pp. 239–257. DOI: 10.1080/1088937X.2016.1239280
14. Sinitsa A.V. The Education System Development as a Factor in the Demographic Growth of the Far North of Russia. *Arktika i Sever* [Arctic and North], 2019, no. 37, pp. 22–50. DOI: 10.17238/issn2221-2698.2019.37.22
15. Karaseva L.A., Okhrimenko A.O. Oplata truda pedagogicheskikh rabotnikov v regionakh Kraynego Severa Rossii: ekonomiko-statisticheskiy analiz [Teaching Staff's Salaries in Regions of the Far North: Economic and Statistical Analysis]. *Voprosy statistiki*, 2020, vol. 27, no. 3, pp. 81–93. DOI: 10.34023/2313-6383-2020-27-3-81-93
16. Sinitsa A.L. Zarabotnaya plata v obshchem obrazovanii v regionakh Rossii [Salaries in General Education in Russian Regions]. *Narodonaselenie* [Population], 2019, no. 2, pp. 78–90. DOI: 10.24411/1561-7785-2019-00017
17. Sinitsa A.L. Zarabotnaya plata kak faktor razmera semyi pedagogicheskikh rabotnikov obshchego obrazovaniya [The Salaries as a Factor of the Family Size of the Pedagogical Employees in General Education]. *Nauchnye trudy: Institut narodnokhozyaystvennogo prognozirovaniya RAN* [Scientific Articles - Institute of Economic Forecasting Russian Academy of Sciences], 2019, vol. 17, pp. 415–435. DOI: 10.29003/m828.sp\_ief\_ras2019/415–435
18. Sinitsa A.L. Mezhregional'nye razlichiya v oplate truda: pedagogicheskie rabotniki v munitsipal'nykh shkolakh [Regional Diversity in Salaries: Teachers in Municipal Schools]. *Vestnik Sankt-Peterburgskogo universiteta. Ekonomika* [St. Petersburg University Journal of Economic Studies (SUJES)], 2019, vol. 35, no. 1, pp. 26–49. DOI: 10.21638/spbu05.2019.102
19. Gabysheva F.V. Vybor strategii v otsenke kachestva obrazovaniya [The Choice of Strategy in Assessing the Quality of Education]. *Nauka i obrazovanie*, 2008, no. 1, pp. 52–57.

20. Bondarenko L.V. Razvitie sel'skikh territoriy Rossii: otsenki, mneniya, ozhidaniya [Development of Rural Territories of Russia: Estimates, Opinions, Expectations]. *Sotsiologicheskie issledovaniya* [Sociological Studies], 2016, no. 3, pp. 76–82.
21. Afanasyeva L.I., Porotova N.A. Problema razvitiya malokomplektnoy shkoly v Respublike Sakha (Yakutiya) [The Problem of the Development of a Small School in the Republic of Sakha (Yakutia)]. *Perspektivy nauki* [Science Prospects], 2019, no. 8 (119), pp. 110–112.
22. Kozhurova A.A., Safonova D.V. Problema trudoustroystva uchiteley nachal'nykh klassov v malokomplektnykh shkolakh Olekmenskogo rayona Respubliki Sakha (Yakutiya) [The Problem of Employment of Primary School Teachers in Ungraded Schools of Olekminsky District of the Sakha Republic (Yakutia)]. *Nauchnyy elektronnyy zhurnal Meridian* [Scientific Electronic Journal Meridian], 2018, no. 4 (15), pp. 312–314.
23. Martynenko O.O., Karev B.A., Soboleva E.V., Klyuchnikov D.A. Problema privlecheniya i professional'noy adaptatsii molodykh uchiteley: analiz faktorov i opyt resheniya [The Problem of Attracting and Professional Adaptation of Young Teachers: Analysis of Factors and Experience in Solving]. *Obshchestvo: sotsiologiya, psikhologiya, pedagogika* [Society: Sociology, Psychology, Pedagogics], 2020, no. 6 (74), pp. 135–143.
24. Eflova Z.B. Problemy preemstvennosti trudovogo vospitaniya v sovremennoy sel'skoy shkole [Succession Problems of Labor Education in a Modern Rural School]. *Nepreryvnoe obrazovanie XXI vek* [Lifelong Education: the XXI Century], 2016, no. 2 (14), pp. 56–68.
25. Balashov Yu.V. Psikhologo-pedagogicheskie osobennosti obucheniya uchashchikhsya natsional'nykh shkol Severa (na primere natsional'nykh shkol Khanty-Mansiyskogo avtonomnogo okruga) [Psychological and Pedagogical Features of Teaching Students of National Schools of the North (on the Example of National Schools of the Khanty-Mansiysk Autonomous Okrug)]. *Al'manakh sovremennoy nauki i obrazovaniya* [Almanac of Modern Science and Education], 2009, no. 4–1 (23), pp. 27–31.
26. Indenbaum E.L. Sotsiokul'turnye determinanty poznavatel'noy deyatel'nosti detey malochislennykh narodov Severa [Socio-Cultural Determinants of the Cognitive Activity of Children of Small-Numbered Peoples of the North]. *Kul'turno-istoricheskaya psikhologiya* [Cultural-Historical Psychology], 2008, no. 3, pp. 25–32.
27. Sinitsa A.L. Povyshenie urovnya i kachestva obrazovaniya korennykh malochislennykh narodov Severa: problemy i perspektivy [Improving the Educational Background Level and Quality of the Indigenous Small-Numbered Peoples of the North: Problems and Prospects]. *Uroven' zhizni naseleniya regionov Rossii* [Living Standards and Quality of Life], 2019, no. 3 (213), pp. 70–81. DOI: 10.24411/1999-9836-2019-10074
28. Doyle A., Kleinfeld J., Reyes M. The Educational Aspirations/Attainment Gap Among Rural Alaska Native Students. *The Rural Educator*, 2009, vol. 30, no. 3, pp. 25–33. DOI: 10.35608/ruraled.v30i3.446
29. Bania E.V., Eckhoff C., Kvernmo S. Not Engaged in Education, Employment or Training (NEET) in an Arctic Sociocultural Context: the NAAHS Cohort Study. *BMJ Open*, 2018, vol. 9, no. 3, pp. e023705. DOI: 10.1136/bmjopen-2018-023705
30. Goodlad J. *Vot chto nazyvaetsya shkoloy* [That's What is Called a School]. Moscow, Prosveshchenie Publ., 2008, 475 p. (In Russ.)
31. Kasprzhak A.G., Bysik N.V. Kak direktora shkol prinimayut resheniya? [How do School Principals Make Decisions?]. *Praktiki razvitiya: individual'nye, korporativnye, institutsional'nye svobody i ogranicheniya* [Development Practices: Individual, Corporate, Institutional Freedoms and Restrictions], 2015, pp. 106–125.
32. Galindabaeva V.V., Karbainov N.I. Ekonomika usynovleniya kak strategiya vyzhivaniya malykh sel (na primere Buryatii) [The Economics of Child Adoption as a Survival Strategy for Small Villages. The Case of Buryatia]. *Zhurnal issledovaniy sotsial'noy politiki* [The Journal of Social Policy Studies], 2020, vol. 18, no. 2, pp. 207–220. DOI: 10.17323/727-0634-2020-18-2-207-220
33. Bozhedonova Z.N. Agrohkola na polyuse kholoda [Agricultural School at the Pole of Cold]. *Narodnoe obrazovanie* [National Education], 2013, no. 6, pp. 62–66.

34. Nemirich T.N. Ekonomicheskiy i vospitatel'nyy effekt detsko-vzroslogo proizvodstva malo-chislennykh shkoly [Economic and Educational Effect of Child-Adult Production of a Small School]. *Sotsial'naya pedagogika* [Social Pedagogy], 2015, no. 5–6, pp. 21–26.
35. Bæck U.-D.K. Rural Location and Academic Success—Remarks on Research, Contextualisation and Methodology. *Scandinavian Journal of Educational Research*, 2016, vol. 60, no. 4, pp. 435–448. DOI: 10.1080/00313831.2015.1024163
36. Klene A.E., Nelson F.E., Nevins J., Rogers D., Shiklomanov N.I. Permafrost Science and Secondary Education: Direct Involvement of Teachers and Students in Field Research. *Geomorphology*, 2002, vol. 47, no. 2–4, pp. 275–287. DOI: 10.1016/S0169-555X(02)00093-4
37. Buzinov R.V., Amerina E.A., Unguryanu T.N. Vliyanie usloviy obrazovatel'noy sredy na sostoyanie zdorov'ya detey doshkol'nogo i shkol'nogo vozrasta na territorii Arkhangel'skoy oblasti [The Impact of Learning Environment on Child Health at Pre-Schools and Secondary Schools in Arkhangel'sk Region]. *Analiz riska zdorov'yu* [Health Risk Analysis], 2015, no. 3, pp. 27–32.
38. Shemetova E.V., Boytsova T.M. Pitanie shkol'nikov Primorskogo kraja: sovremennoe sostoyanie, kachestvo i monitoring [Schoolchildren Nutrition of Primorsky Krai: Current Situation, Quality, Monitoring]. *Tekhnika i tekhnologiya pishchevykh proizvodstv* [Food Processing: Techniques and Technology], 2017, vol. 45, no. 2, pp. 112–118.
39. Ulanova S.A. Fiziologo-gigienicheskaya otsenka munitsipal'noy modeli “shkola — territorial'nyy tsentr zdorovyesberezheniya” v usloviyakh Kraynego Severa [Physiological and Hygienic Assessment of the Municipal Model "School - Regional Center of Health Care" in the Far North]. *Voprosy shkol'noy i universitetskoy meditsiny i zdorov'ya* [Problems of School and University Medicine and Health], 2015, no. 1, pp. 12–20.

*Received on January 16, 2021*