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Indigenous education in the Arctic regions of Russia: response to pandemics

Educação indígena nas regiões Árticas da Rússia: resposta a pandemias

Educación indígena en las regiones Árticas de Rusia: respuesta a las pandemias

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ABSTRACT
The article actualizes the problems of organizing distance learning in the education system of indigenous peoples, including those leading a nomadic or semi-nomadic lifestyle with their parents, in the context of transformation lessons of the pandemic. The authors present the results of the 2020-2021 study of the situation with distant learning in the Arctic regions of Russia (case of the Republic of Sakha (Yakutia) and Yamalo-Nenets Autonomous Okrug). The information was taken from monitoring, questionairies and interviews with teachers, students and education management officers. The research aims to prove inequality but find measures to improve the situation. The authors draw up the prospects for transformation to digital educational environment in remote places and see if we could minimize inequality and social unjustice between children living in the central territories and in the most remote, isolated places of traditional residence of the indigenous small-numbered peoples, including those who lead a nomadic lifestyle with their parents.
Keywords: Arctic regions. Distance learning. Indigenous. Nomadic education. Pandemic.

RESUMO
O artigo atualiza a problemática da organização do ensino a distância no sistema educacional de povos indígenas, incluindo aqueles que levam um estilo de vida nômade ou semi-nômade com seus pais, no contexto das aulas de transformação da pandemia. Os autores apresentam os resultados do estudo 2020-2021 sobre a situação da aprendizagem à distância nas regiões árticas da Rússia (caso da República de Sakha (Yakutia) e Yamalo-Nenets Autonomous Okrug). As informações foram obtidas em monitoramentos, questionários e entrevistas com professores, alunos e gestores da

educação. A pesquisa visa provar a desigualdade, mas encontrar medidas para melhorar a situação. Os autores traçam as perspectivas de transformação para o ambiente educacional digital em lugares remotos e ver se podemos minimizar a desigualdade e a injustiça social entre as crianças que vivem nos territórios centrais e nos locais mais remotos e isolados de residência tradicional dos pequenos povos indígenas. , incluindo aqueles que levam um estilo de vida nômade com seus pais.
Palavras-chave: Regiões árticas. Ensino à distância. Indígena. Educação nômade. Pandemia.

RESUMEN
El artículo actualiza los problemas de la organización de la educación a distancia en el sistema educativo de los pueblos indígenas, incluidos los que llevan un estilo de vida nómada o seminómada con sus padres, en el contexto de las lecciones de transformación de la pandemia. Los autores presentan los resultados del estudio 2020-2021 de la situación del aprendizaje a distancia en las regiones árticas de Rusia (caso de la República de Sakha (Yakutia) y el Okrug autónomo de Yamalo-Nenets). La información se tomó de monitoreos, cuestionarios y entrevistas con docentes, estudiantes y responsables de la gestión educativa. La investigación tiene como objetivo probar la desigualdad pero encontrar medidas para mejorar la situación. Los autores trazan las perspectivas de transformación a un entorno educativo digital en lugares remotos y ven si podemos minimizar la desigualdad y la injusticia social entre los niños que viven en los territorios centrales y en los lugares más remotos y aislados de residencia tradicional de los pueblos indígenas reducidos. , incluidos aquellos que llevan un estilo de vida nómada con sus padres.
Palabras clave: Regiones árticas. La educación a distancia. Indígena. Educación nómada. Pandemia.

INTRODUCTION

The authors present the results of 2020-2021 study of situation with distant learning in the Arctic regions of Russia (case of Republic of Sakha (Yakutia) and Yamalo-Nenets Autonomous Okrug). This study examines the problems of organizing education in the context of pandemic-related changes and their impact on planning, teaching, workload, etc. The information was taken from monitoring, questionairies and interviews with teachers, students and education management officers. The purpose of the research is to prove inequality and find areas and forms of transformation of educational activities, suggest measures to meet modern needs, draw up the prospects for transformation to digital educational environment in remote places and see if we could minimize inequality and social unjustice among children living in the central territories and in the most remote, isolated places of traditional residence of the indigenous small-numbered peoples, including with nomadic lifestyle. The results of the study may support in developing instructional models and motivate teachers to learn new practices in future. New approaches to teachers training may also influence the education policy in future.

Sociocultural Situation in the Arctic Regions of the Republic of Sakha (Yakutia)

The Arctic zone in the Republic of Sakha (Yakutia) includes the territories of 13 regions beyond the Arctic Circle. The area of the Arctic zone is 1,608.8 thousand square kilometers, or more than half of the entire territory of the republic (3,083.5 thousand square kilometers). In the Arctic zone:- 119 settlements: 2 cities, 10 urban-type settlements, 107 rural settlements, 22 of which have no permanent population. The population density is 0.04 people per 1 sq. km. The ethnic composition is dominated by Sakha (47.9%), Russians make up 19.4%, Evenks - 12.1%, Evens - 11.3%, Dolgans - 2.1%, Ukrainians - 2.1%, Yukagirs - 1.3%, Chukchi - 0.8%, other nationalities - 2.4%. Here is the largest number of small schools (over 50%), 32% of schools have running water and warm toilets, 12% of schools need to be reconstructed, though 100% of schools are connected to the Internet. At the end of 2018, the Arctic zone contains 106 000 reindeer, or 73% of the total livestock in the Republic of Sakha (Yakutia). Compared to 2010 with 200,3 thousand reindeer (Federal State

Statistics Service, n.d.), by 2018, the reindeer number decreased by 16.2% (-20.6 thousand heads). Within the framework of the project "Nomadic School", 8 educational organizations provide education while nomading. Training, upbringing and development in various forms of preschool and school education in places of nomadism receive up to 104 children (starting from 90-s).Nomadic schools have state and communities support and work seasonly or throughout the year.

Yamalo-Nenets Autonomous District

The bulk of the population (84%) lives in eight cities of the region, of which 41% - in the two largest settlements of the Autonomous Okrug: Novy Urengoy and Noyabrsk. Among the constituent entities of the Russian Federation, Yamalo-Nenets Autonomous Okrug is ranked 5th in terms of the rate of natural growth. Currently, three groups represent the indigenous peoples of the North: Khanty, Selkup, Nenets. Their number is more than 41 thousand people. The ethnic composition of the population is dominated by Russians (62%). Ukrainians make up 9.7%, Tatars - 5.6%. The share of the Nenets is 5.9%, the Khanty - 1.6%, the Selkups - 0.4%. Over the past five years, the child population in the region has increased by 7.0%. The share of the child population in the total population by the beginning of 2018 was 26.5%. Every fourth inhabitant of the Autonomous Okrug is a child, among the child population every third child is under 6 years old. Within the framework of the project "Nomadic School", 22 educational organizations provide education while nomading after reindeer. Training, upbringing and development in various forms of preschool education in places of nomadism receive 452 kids (in 2012 - 183 kids), but more than 2 thousand kids of preschool age stay with parents on move. Reindeer herding is the main occupation of the indigenous and traditional pastoralist way of life with 665,2 thousand reindeer in 2010 (Federal State Statistics Service, n.d.).

PROBLEM STATEMENT

Remote and Hard-to Reach Village

During the pandemic, the education system of the world reacted to the situation in different ways, depending on location, infrastructure, financial resources, socio-economic conditions and community needs (Borup & Stimson, 2019; Gabysheva & Sitnikova, 2020; Herold, 2020; Kornilov et.al, 2017, 2019; Kornilov & Gosudarev, 2019; Reich et al, 2020; Van Lancker & Parolin, 2020; Wang et al., 2020). In remote and hard-to-reach villages, including nomadic schools, the digital inequality was clearly observed. Many schools have low speed of the Internet. Children from low-income families suffer from lack of means of communication and computers, etc. However, the education system of the Arctic regions of Russia has experienced difficulties due to infrastructure problems (Gabysheva & Sitnikova, 2020) and the teachers who were not ready for quantitative and meaningful changes in their work schedule, workload, etc. (Perminova, 2020).

COVID-19 introduced unplanned changes in the life of society, the structure and content of education, changed the work of many teachers in different aspects (Chernobaj & Davlatova, 2020; MacIntyre et al, 2020). School buildings were closed and learning moved to a distance learning and online environment. This paradigm shift has caused ripple effects and the education system may have changed in ways that have yet to be defined (Isaeva et al, 2020; Kondakov & Sergeev, 2020). Teachers needed to find ways to connect with students and move to unfamiliar teaching methods. Teachers were challenged to provide all their students with a meaningful educational experience (Azano & Stewart, 2016). A large number of students and teachers has moved to a virtual environment. Here, we see the social and digital inequality of youth; at home, many students did not have free and unlimited access to the Internet, in particular, in the tundra settlements of the Arctic regions of the Russian Federation (Gabysheva & Sitnikova, 2020). School closures and online education has also widened the learning gap between children from low- and high-income families (Reich et al., 2020), as children from low-income families (large families) remain unequal. Home

conditions, in which children study remotely and their parents work, who do not have the ability to control the learning process, aggravate the difficulties that arise, these problems are noted both in foreign and Russian schools. The administrations of educational organizations were forced to take measures to organize effective interaction via available means of communication. Accordingly, the demand for personalized and effective education for indigenous in the digital educational environment has been actualized (Nikolaeva & Sitnikova, 2020).

In the United States, about 5% of public school students do not have a permanent place of residence (Van Lancker & Parolin, 2020). In New York City, which has seen a significant proportion of US cases of COVID-19, one in ten students was homeless or experienced severe housing insecurity during the previous school year (Cohen & Kupferschmidt, 2020). In the regions of the Far North and the Arctic zone of the Russian Federation, about 7 thousand children are brought up in nomadic families, that is, they move along pastoral routes for reindeer, they often have very expensive satellite communications and limited access points at the main bases (trading posts) (Sitnikova & Nikolaeva, 2020). A similar situation on the way to transferring schools online is observed in the studied Arctic regions: insufficient provision of students with digital devices and the lack of high-speed Internet for thousands of families. Children from low-income families find it difficult to complete their homework via the Internet from home and in an unstable family situation (Sitnikova & Gabysheva, 2020). Thus we had designed research questions to know the real situation with computers and Internet access in remote and hard-to reach villages in reindeer herding areas.

Impact on Teachers

Distance learning opportunities proposed by individual researchers (Azano & Stewart, 2016; Chernobaj & Davlatova, 2020; Kornilov et al., 2019; Kornilov & Gosudarev, 2019) are new and not yet fully understood for many teachers, as the teacher's role changed during the crisis (Al Lily et al., 2020; Fardoun et al., 2020; Mohmmed et al., 2020; Wong & Moorhouse, 2020). Teachers suffered isolation and work in residential settings where existing lesson plans are no longer adequate, it became necessary for teachers to master new technologies at a distance from the students themselves. It contributed to stressful situations and negative emotions (MacIntyre et al., 2020). In some countries, attempts were made to use open educational resources (OER) and open educational practices (OEP) as effective measures to overcome the problems associated with the imposed restrictions (Huang et al., 2020). Many foreign scientists note that both schoolchildren and teachers had to develop new learning skills (Lellis-Santos & Abdulkader, 2020), and they often did not adapt well to social isolation and loneliness (Brooks et al, 2020). School principals and administrative structures switched to online meetings and had to find ways to connect students to the Internet, provide computers, expand catering services (Cohen & Kupferschmidt, 2020; Department of Education of YaNAO, 2020a) and provide a free set of food products on account of hot meals, for example, in Russian schools, subsidized from the federal budget (Department of Education of YaNAO, 2020b). Unexpected interruptions in the education of school-aged children associated with COVID-19 have led to the need to research and document major shifts in teaching practice and teacher responsibilities (Isaeva et al, 2020; Kosareczkij, 2020; Panov et al, 2020). Caring for educators is an important factor in ensuring the sustainability of education in the future. Research shows that “successful student learning outcomes begin with caring for teachers, prioritizing their mental health, maintaining their self-confidence and understanding their workload” (Baired, 2020).

The research findings can help education policymakers to develop and implement transformed learning models and encourage teachers to explore and implement new educational practices, as well as prepare future teachers to work in the difficult conditions of the Arctic zone, where schools are also often closed due to low air temperature, seasonal flu, in 2020 - due to Covid-19 (Bochaver et al, 2020; Gabysheva & Sitnikova, 2020).

In the research we take the term 'distance learning' rather then the term "online learning", as "online" actually was not available for each student of teacher.

RESEARCH QUESTIONS

Research Questions to School Teachers

The following research questions were addressed to school teachers of the Republic of Sakha (Yakutia) and YamaloNenets Autonomous Okrug of Russia: how often did you use the computer at school in the classroom or in nomadic conditiions during the pandemic; what experience of distant or online learning models did you have during the pandemic; what changes can you report to ensure equal learning for all your students; how would you rate the degree of success / complexity of using the elements of distant or online learning; how do you assess the experience of the students/

Research Questions to Future Teachers (Students of Pedagogy Institute)

To forsee future teachers' (students of pedagogy institute) readiness to transformation the following research questions were addressed: how did you perceive the experience of the teachers in terms of readiness for distant or online interaction; what have you experienced during a pandemic (full online learning, blended learning, face-to-face learning, etc.); what changes have you noticed during the pandemic in terms of workload, free time, quality of education; how would you rate the degree of success / complexity of using elements of online learning (using video communication Zoom, Skype, Google Meet, etc.; using ready-made online courses at stepik.org, openedu.ru, SsOS, etc.; work in a distance learning LMS MOODLE, etc .; interaction via e-mail).

Throughout this paper "online instruction" is recognized in the context of the pandemic (e.g., emergency online teaching), which involved the switch to online delivery of curriculum that would otherwise be delivered face-to-face in a physical classroom; the term "distant learning" is considered to be a flexible or blended arrangement of a learning process with limited access to Internet.

Interviews

To have facts on access to computers during pandermic short interviews were addressed to students and teachers who have experience of nomadic life in remote territories. Thus, the responders had to explain their situation with computers and wrote letters or expressed in conversations their attitudes to challenges of pandemics and transfer to distant or online learning of pandemics and transfer to distant or online learning.

PURPOSE OF THE STUDY

Transformation of Educational Activities

The first purpose of the study is to find areas and forms of transformation of educational activities of school teachers, and in future better understand measures to meet modern needs, draw up the prospects for transformation to digital educational environment in remote places.

Suggest Measures to Improve the Situation

The second purpose to see if we could minimize inequality and social unjustice among children living in the central territories and in the most remote, isolated places of traditional residence of the indigenous small-numbered peoples, including with nomadic lifestyle. The results of the study may support in developing instructional models and motivate teachers to learn new practices in future. New approaches to teachers training may also influence the education policy in future.

RESEARCH METHODS

The study presents changes in the teaching practice and daily professional life of a rural secondary school teacher teaching his students using distance learning technologies, including online during the 2019-2020 pandemic. Data sources included direct observations and observations of participants, open conversations, online surveys of teachers and students in the Arctic regions in the case of the Republic of Sakha (Yakutia) and the Yamalo-Nenets Autonomous Okrug. The data from the teachers' experience was also obtained as a result of a survey involving 400 teachers from the above named regions of Russia, including 200 school teachers from 13 Arctic regions of the Republic of Sakha (Yakutia) and 200 teachers from the Yamalo-Nenets Autonomous Okrug during the pandemic. The express questionnaire was also attended by 200 students - future teachers of the North-Eastern Federal State University named after M.K. Ammosov. To prove the real situation with access to computers and Internet the study was addressed to children and teachers from nomadic communities, among them 46 kids at 10-14 age, 43 kids at age 15-17, 42 teachers. Interviews of represantatives of the education management (municipal officers - 5, heads of the schools - 5) introduced the models of distant learning that were in practice during pandemia and need further transformation.

Data collection included open-ended and closed questions about how instruction process changed, how teachers percieve new workload, what were successful elements in their weekly work, what challenges were encounted. Questions also focused on relationship of teachers and students and the role of parents, of school leadership, IT support. Conversations focused on future changes to support teachers and students in distant and online learning.

The initial automatic analyses of data proceeded with analyses of interviews and conversations which included workload, successful and unsuccessful elements, common difficulties, interaction with students, attitude to emerging problems. Also the analysis of models of distant learning given in literature and in practice as responce to pandemic situation in the context of the Arctic regions of Russia was done.

FINDINGS

Digital Situation in Education Systems of the Republic of Sakha (Yakutia) and Yamalo-Nenets Autonomous Region of Russia

In the 2019-2020 academic year, the schools of the Republic of Sakha (Yakutia) and the Yamalo-Nenets Autonomous Okrug joined the federal project "Digital Educational Environment", within which digital educational programs are beginning to be used in the Arctic (Department of Education of YaNAO, 2020a). By 2020, all schools in the Arctic regions of the Republic of Sakha (Yakutia) had access to the Internet, programs were initiated to improve the qualifications of teachers in the framework of the projects “Teachers of the Arctic”, “Connection to high-speed Internet of small and hard-to-reach educational organizations in districts of the Republic of Sakha (Yakutia) "," Mobile education for a nomadic school "and others (Gabysheva & Sitnikova, 2020). Participation in this project contributed to the renewal of the material and technical base of schools (modern technology and software; equipment for high-speed Internet access, etc.). For example, in the Yamalo-Nenets Autonomous Okrug, every child at school was provided with a personal computer or laptop; within the framework of the project "Digital educational environment", 77 schools and 4 colleges were allocated laptops for students (2436), for teachers (711), as well as interactive complexes (168) and multifunctional devices (8) (Department of Education of YaNAO, 2020b, 2020c). Meanwhile, the facts of digital inequality of the population were revealed, in particular, in the field of education in the Arctic regions of Russia.

All-Russia Survey Showed Yakutia's Leadership

In this aspect, a study of the HSE Laboratory of Media Communications in Education (Saprykina & Volokhovich, 2020) aroused great interest, in which the main difficulties and problems faced by teachers in the transition to distance learning in the Russian Federation were analyzed. For example,

> half of the teachers surveyed noted that they had problems connecting to online broadcasts due to the lack of technical devices (for example, no webcam, headphones, computer). More than 75% of the teachers surveyed face problems in conducting online lessons due to the lack of technical devices (computers, tablets, webcams, etc.) among students. Half of the teachers surveyed noted that students do not have access to the Internet at home, which causes difficulties in organizing distance learning. Overall, more than half of teachers have technical devices for video and audio conferencing. 84% of them indicated that they have the opportunity to work on educational online platforms. At the same time, most of the teachers note that not all students in the classroom have this opportunity. (Saprykina & Volokhovich, 2020).

In the analysis of the HSE, it is noted that

> of the regions examined, the Republic of Sakha (Yakutia) is of the greatest interest. In this region, the indicators for the technical equipment of teachers and children are significantly higher than in other regions and Russia as a whole. In Yakutia, 61% of teachers conduct video lessons, while the average figure for Russia is 25%. (Saprykina & Volokhovich, 2020).

Results of the Research

The results of the research conducted by the authors of the article also showed that only 11.5% of teachers received the experience of full online education during the pandemic in the Arctic regions of the Republic of Sakha (Yakutia), while in the Yamalo-Nenets Autonomous Okrug - 66.5%, and future teachers - 84.5%. Teachers actively used other methods of interaction (communication via WhatsApp, social networks, telephone, visiting families, etc.), including in Yakutia - 43% of teachers, in the Yamalo-Nenets Autonomous Okrug used other methods of interaction - 10%. According to 69.5% of teachers in Yakutia and 49.7% of teachers in the Yamalo-Nenets Autonomous Okrug, the reasons for the increase in teaching load and workload are low speed and technical problems with communication channels. Therefore, the educational process was often organized using instant messengers (Viber, WhatsApp). The transfer of homework was carried out on paper and / or on USB flash cards.

In the first half of 2020, during the approbation of 10 leading federal platforms "Uchi.ru", "Skyeng", "Mobile e-Education", "Yandex.book", "Yaklass", "Physicon", "Foxford", "Open School" , "Globallab", "Native class" "in 30 schools of the district, the most effective methods of implementation and the difficulties of their implementation were revealed" (Department of Educatiob of YaNAO, 2020a). Thus, M.V. Kravets, director of the education department of the Yamalo-Nenets Autonomous Okrug, in her interview for the media, notes that "in the okrug, distance learning is built according to three models. The first is used if there is a high-speed Internet, and all participants in the process are provided with computers. In this case, educators incl.

The questionnaire also covered future teachers, since the training of teaching staff received a great impetus during the pandemic and a chance for large-scale practical distance learning. It was attended by 200 students - future teachers of the Pedagogical Institute of the North-Eastern Federal University named after M.K. Ammosov, a short survey of which - about the problems of transition to online education. Here are some of its results. So, as an experience of implementing online learning models during a pandemic, 82% of students noted full online education (training on online courses / electronic platforms, using video communication, without face-to-face interaction);

recorded the success of work in the distance learning environment (LMS MOODLE, etc.) - 49%; perceived the experience of teachers as a readiness for online interaction - 73%. At the same time, respondents indicated significant changes during a pandemic: an increase in the teaching load - 65%; less free time - 48%; a decrease in the quality of education was noted by 42% of students. The data demonstrate, on the one hand, the pre-pandemic practice of using online learning and satisfaction with it, on the other hand, an increase in labor costs and a decrease in the quality of education.

The results of questionnaires, automated surveys and factual materials made it possible to identify the reasons for the transformation of teachers' professional activities during a pandemic, as well as the problems that arise in this case. Summarized answers about changes in educational activities from interviews with teachers and administrators can be presented by categories like in Table 1.

Table 1. Changes in teaching.

Category	Changes in the teachers' work
Workload	The workload of the teacher has increased: prompt actions to draw up an individual curriculum for each student, develop assignments, check the work of each student, compile a report on completed and not completed homework by children, making adjustments to the curriculum for each subject, filling out 3 types of class journals (magazine in electronic format, class magazine, and magazine in the "Network City"), the direction of everything done to the school leadership. Due to problems with Internet speed, all these actions of the teacher took a lot of time, far beyond the scope of the worker.
Successful elements	The growing responsibility of parents for the education of their child. Constant communication of the teacher with parents through the WhatsApp messenger and mobile communication; counseling of parents. Increasing the level of students' independence in doing homework. Opening a "hot line" with the school administration via a cell phone and an Internet resource.
Difficulties	Inability to organize online training due to the lack of quick access to resources on the Internet. Insufficient coverage of all children, including those who did not have computers and smartphones with Internet access. The laboriousness of the preparation of individual curricula for students and the exchange of "task-answer-check" via phone, case-boxes, WhatsApp. The acute impact of social isolation.
Interaction with students	The class teacher and the school administration prepared individual case files, CDs for electronic lessons, flash media with a weekly assignment. Every Monday, class teachers and subject teachers distributed these cases to students' homes and collected cases-folders with already completed work. Each student was registered through the "Network City" The publication of reports on the implementation of individual or group projects was posted on the social networks WhatsApp, Instagram and Facebook. Problem: it was not always possible to compose individual tasks due to lack of time.
Attitute to pandemic situation	Children and students note the lack of "live communication" with friends, classmates, fellow students, teachers

The results of the study made it possible to answer the question of how important it is to study and possess information on the problem in order to take adequate measures in time, minimize risks, etc. Thus, in the presence of objective differences due to territorial and economic characteristics, much has been done to provide distance learning for schoolchildren and future teachers of the Arctic regions. At the same time, it is important to try to determine the conditions for increasing the effectiveness of distance learning, which include the following: ensuring the consistency of distance learning in order to ensure continuity, interconnectedness, unity of all actions, etc.; organization of a unified electronic educational environment that provides interaction

of all users; storage, regular updating and systematization of educational and methodological resources; support of participants in educational activities using distance technologies; constant monitoring of the distance learning process and its effectiveness; organization of the educational process in accordance with curricula adapted to distance learning, taking into account the specifics of the organization of training (number of hours, workload, technologies used, feedback, assessment of results, etc.); a combination of classroom and distance learning, independent work of students, as well as the inclusion of traditional teaching materials;

- compulsory consideration of the individual characteristics of each student, the degree of ICT proficiency, the availability of electronic resources, etc.; organization of the educational process in different modes for personalization: online (lessons and interaction with the teacher in real time using ICT); in the delayed time mode, which provides the student with the opportunity to master the educational material at any time convenient for him); special training of teachers in the use of distance learning technologies. The specified conditions are necessary for the implementation of distance learning is only comprehensive, i.e. fulfillment of each condition, which is a single basis for successful distance education of schoolchildren in order to improve the quality of school education.

Considering the organizational forms of distance learning, we note that their choice and combination depends largely on the model of distance learning that is implemented in a particular case, in our case - in a rural school with a network of branches, including in places of nomadic children leading with parents a nomadic or semi-nomadic lifestyle. In turn, the choice of the model depends not only on the equipment of the distance educational process, but also on the readiness of teachers.

DISCUSSION

Various aspects of distance learning are currently being actively studied by many researchers, whose works have studied the expectations, opportunities and risks of digital education (Perminova, 2020), the use of adaptive e-learning (Vanstein & Shershneva, 2020), modern methods and forms of organizing distance learning (Aleinikova, 2020). The issues of organizing distance learning in the northern regions of Russia are considered in the studies of A.V. Zhozhikov (2004). The problems of organizing distance learning for children of indigenous small peoples of the North, Siberia and the Far East are reflected in the articles of E.S. Polat (2020), F.V. Gabysheva (2020), A.D. Nikolaeva (2020), N.V. Sitnikova (2020). Foreign researchers (Baired, 2020; Bochaver et al., 2020; Herold, 2020; Huang et al, 2020; Kosareczkij, 2020; Lellis-Santos & Abdulkader, 2020; MacIntyre et al., 2020; Reich et al., 2020, etc.) and domestic scientists (Isaeva N.V. et al., 2020; Panov et al., 2020, etc.) Also, analyzing the situation in education during a pandemic, they note the need for a quick transition of students and teachers to mastering new skills, their difficult adaptation to social isolation, an increase in the learning gap between children from different social groups with disabilities, etc.

Currently, there are several models of distance learning described by a number of authors (Polat, 2020). In particular, the Institute for Distance Learning (IDE) of the University of Maryland USA distinguishes the following distance learning models: model A: distributed classroom, model B: independent work of students, model C: open education + classroom [115]. As the experience of the Republic of Sakha (Yakutia) shows,and in most schools in the Arctic regions, model B has been implemented: independent work of students, designed for free placement of students, and their work in asynchronous mode. Students are provided with all the necessary teaching and learning materials, including curricula. Using e-mail, forums, chats and other telecommunication means, they establish contact with the teacher, who answers questions, evaluates their work. In conditions of limited access to the Internet, it is possible to consider other models of distance learning, considered in the works of A. A. Andreev and V. I. Soldatkin (1999): "Case technology model (CT model)", "Correspondent learning model (CO model)", radio and television training model (RT

model). These models, as the authors point out, are applicable to a greater extent in universities. However, such elements as distribution of materials by e-mail, face-to-face consultations, and the use of video conferencing can be successfully used in organizing distance learning for students in a rural school. Such forms of distance (e-learning), given the appropriate conditions, can also be organized in field (nomadic) conditions, the features of which are noted by A.D. Nikolaeva and N.V. Sitnikova (2020).

CONCLUSION

Research on educational transformation has shown that digital access and connectivity remain widespread equity issues, especially in rural areas. The remote activity of both schoolchildren and teachers during COVID-19 exacerbated existing socio-economic problems and highlighted the critical social role of schools in today's environment (Department of Education of YaNAO, 2020a). Students, future teachers, feel more independence and take on new responsibilities for self-study. Schoolchildren also show greater independence in organizing their study time. The forced transition to distant and in some cases to online learning opened up new opportunities in terms of organizing the educational process. Personalization of education quality assessment has begun to take on clearer individualized forms using technology to demonstrate student skills, and large-scale standardized testing may become obsolete. As U. Kaden (2020, p. 11) notes, “no distance learning model will provide equal educational opportunities for all, and virtual learning will not be a cheap solution to the ongoing financial crisis in the education system”.

The following can be recommended to cure situation. Of great importance for the organization of independent work of students, especially in primary and secondary schools, is the involvement of parents in the organization of distance (on-line) education, increasing their competencies in terms of computer literacy. Replaying lessons in full-time class should not be the goal of online education. Online delivery can reduce travel time and costs, increase access and collaboration with experienced professionals around the world, provide learners with the flexibility to access courses at their convenience, and allow for adjustments in topics and content. During school closings due to COVID-19, it was important to place equity at the center of distance learning plans, with stronger guidance for specific populations. However, despite the efforts made, during the crisis, not all students were able to get quality access to online education due to the imperfect infrastructure of information and communication technologies in rural areas of the Arctic regions. The experience gained by the education system during a pandemic and digital transformation of the economy aims the participants in educational relations (teachers, students, parents and managers) to integrate efforts, to continuously improve their qualifications in terms of using a variety of models of distance learning and education management. This can significantly increase the effectiveness of technologies and will have a developing influence on children, parents, teachers and educational authorities, will become the basis for the development of resources and educational practices, and in general - the development of continuous open general and professional education. Situations of free discussion and testing of new ideas and models will arise, for example, about the length of school days and the academic year, the introduction of flexible schedules, determining the cost of the necessary technological infrastructure, what can and cannot be taught in the online environment, and what new pedagogical skills teachers may need how the interaction of teachers with parents and their role in this of parents of primary school age children are changing. Today's teachers need to be prepared to respond quickly and flexibly to the rapidly growing number of online learners, and training needs to take into account how students develop the pedagogical skills to work in a blended learning environment.

Thus, a strong education system with flexible learning models should be an important component of the economies of all countries. Professional experience during a pandemic can be a catalyst for the creation of a new, more effective method of teaching our children and students.

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