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Innovative Technologies for Practical Training of Future Defectologists during the Pandemic

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Abstract

The article examines the problem of organizing distance practical training of future defectologists using innovative technologies. During the pandemic, the education system in the Russian Federation and several other countries in the world switched to distance education, which became an alternative measure. The purpose of the study is to identify the features of organizing curricular practical training remotely and review effective innovative technologies for organizing distance practical training of defectologists. To achieve this goal, the following methods were used: analysis of Russian and foreign psychological and pedagogical literature, normative and educational documents of North-Eastern Federal University and Blagoveshchensk State Pedagogical University outlining practical training of students, observation, and questionnaires. 127 NEFU and BSPU undergraduate and graduate students majoring in "Special (defectological) education" participated in the survey. According to the research results, problems related to distance practical training, the reasons for their occurrence, and ways to eliminate them were identified. Based on the analysis of educational and methodological documentation and questionnaires, the need for the introduction of innovative technologies to the organization of distance practices in all its blocks (target, organizational, content, technology) is justified. The results of the research can be used in further studies of the use of distance technologies taking into account the possibility of extreme events in the modern world.

Keywords: future defectologists, practical training, student practice, distance learning technologies, special needs children.

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Introduction

In the era of digitalization, innovative technologies have entered all aspects of human life and became an integral part of globalization. Their use was accelerated during the pandemic. In this regard, there is an urgent need to rethink training of future specialists. During the pandemic, distance learning became a forced and uncontested form of education. Distance learning as an educational system was reviewed in the works of Polat (2005), Khutorskoy (2005), and others. The analysis of the unique experience of mastering innovative electronic technologies in the context of the pandemic, modification of the means of interaction between participants of the educational process in the shortest possible time were explored in the studies of Abramyan & Katasonova (2020), Blinov, Sergeev, & Yesenina (2020), Krotkova & Nurlygayanov (2020), Panina & Sorochinsky (2020), and others. The problem of practical training of future defectologists in the context of the pandemic is of particular interest, especially with regard to the issues of implementing digital technologies in curricular practical training, the use of situation analysis technologies for active learning of students in distance mode, and organization of student interaction with children with disabilities and their parents during the lockdown.

Purpose and objectives of the study

The purpose of the study is to identify the features of conducting distance curricular practical training and justify the use of the innovative technologies for organizing distance practical training of future defectologists at the North-Eastern Federal University named after M. K. Ammosov (NEFU) and the Blagoveshchensk State Pedagogical University (BSPU). The objectives of the research are to 1) study the concept of "distance learning"; 2) examine the role of students' self-organization in distance learning; 3) examine innovative educational technologies used during students' practical training; 4) identify the principles of the effective use of innovative technologies in the organization of distance practical training of students-defectologists.

Literature review

The process of digitalization in the modern world is a key tool of globalization. Before the lockdown, digitalization of the learning process was seen as a necessary but not fundamental segment of education (Strikhanov, Gevorgyan, & Podufalov, 2020). During the pandemic, the entire education system of the Russian Federation and several other countries in the world switched to the distance learning (Dhika, Destiawati, Surajiyo, & Jaya, 2021; Nikolaev, 2020).

Distance learning is considered, on the one hand, as an independent learning system that includes network interaction using information and communication technologies as well as pedagogical technologies (Khutorskoy, 2005; Polat, 2005). On the other hand, it is viewed as a separate distance education technology. In article 16, paragraph 1 of the Law "On Education in the Russian Federation" (Government of the Russian Federation, 2012), distance education technologies are defined as the interaction between students and teachers mediated by information and communication technologies. Distance education technologies became an alternative means of learning during the pandemic, which turned out to be a natural experiment in studying the potential and limitations of digital transformation of the educational process. At the meeting aimed to review the situation in the education system that has developed under the influence of the spread of coronavirus infection, Vladimir Putin stressed that the transition to the distance format is a temporary measure, but this unique experience should be used to improve the quality and accessibility of education (Nikolaev, 2020).

Studies examining the initial stage of the pandemic, when all educational organizations urgently switched to distance learning, are of particular interest. Such studies were conducted on the use of digital platforms. It was reported that the cloud technologies that were not developed specifically for various disciplines were used quite widely. Scientists explored the organization of daily routine of teachers and students during the pandemic. It turned out that teachers had almost no time to rest as they had to spend a long time at the computer where classes were conducted, assignments were checked, and preparation for classes was carried out.

Also, it was difficult for students to organize themselves because they spent their leisure time at a computer and other information and communication devices (Blinov et al., 2020). For more successful self-organization, several stages of labor organization were proposed: the motivational stage that involves setting a goal; the constructive stage which includes drawing up a plan; the stage of correcting the time that could not be correctly distributed; the reflexing stage when the work is evaluated (Mahmudova, 2020).

The pandemic also had a significant impact on the restructuring of the labor market and the forms of interaction between people (Panina & Sorochinsky, 2020). The paradox of the situation was that despite the lockdown, personal boundaries were erased, teachers and students interacted in a home environment, and families had to provide their students with technical means of communication and organize time and space logically so that no one interfered with each other. All this placed an additional financial and moral burden on families (Abuhammad, 2020).

The very transition of the entire education system to distance learning is an innovative technological process. Studies of the organization of distance learning during the pandemic revealed a number of constraints: the reduced technical and software equipment of students at home; the lack of high-speed Internet; insufficient motivation and self-organization of students to perform independent work; the complexity of steep learning curve; the older generation of teachers, as a rule, in the humanities and natural sciences; the development of IT technologies. It was indicated that during the organization of educational and industrial practical training, teachers and students had insufficient provision of a developed technical and technological base at home (Abramyan & Katasonova, 2020). Regarding the difficulties of implementing distance learning, the researchers identified objective and subjective reasons for the phenomenon. Objective reasons include difficulties in material and technical support, high-quality implementation of educational programs in the conditions of distance learning. Subjective reasons encompass features of interaction and self-organization (Krotkova & Nurlygayanov, 2020).

Innovative technologies in education are considered in two directions: information and computer technologies, and innovative pedagogical technologies (Moiseev, 2003). In addition to the above-mentioned technological areas, during the pandemic, students were actively involved in the volunteer movement which is the part of the socio-cultural technology (Paklina, 2019). The development of students' professional competencies occurred primarily through practical training with the expansion of social partnership (Yudina, Abramova, & Kornilova, 2017). The diversification of innovative technologies of the education system and social protection has had an impact on the organization of students' practical training (Bochanova & Chernukhina, 2015; Sukharkova, 2017).

All types of practices of students-defectologists are carried out according to the principles of consolidating and mastering the professional competencies necessary to work with children with disabilities (Yudina et al., 2017). Educational program "Special (defectological) education" offers an applied practice. During the pandemic, it was necessary to competently use different types of distance technologies: synchronous and asynchronous (Krotkova & Nurlygayanov, 2020).

Thus, during the pandemic, distance learning acted as a non-alternative education system and at the same time, as an independent innovative technology that includes indirect interaction of participants in the educational process using information and communication technologies. Distance learning identified one of the fundamental problems of students' self-organization which is essential in the competence model framework. It is not possible to form the competencies necessary for future specialists in isolation from practical training. The organization of students' distance practical training involves integration of information and communication, innovative pedagogical and socio-cultural technologies.

Methodology

The study involved 127 undergraduate and graduate NEFU (n=85) and BSPU students (n=42) majoring in "Special (defectological) education". These universities are the leading centers for training highly qualified defectologists in the Far Eastern Federal District of Russia. Since 2001, NEFU has prepared defectologists not only for the Sakha Republic (Yakutia) but also for the entire north-eastern part of the Russian Federation. BSPU has been training pathologists since 2015 for the Amur region and the entire south-east of Russia. NEFU undergraduate students (n=76) major in "Speech Therapy", nine master students major in "Psychological and pedagogical support of young children with developmental problems". BSPU master students (n=12) major in "Defectologist in inclusive education", and 30 fourth-year bachelors – in "Training of persons with speech disorders (speech therapy)". Informed consent was obtained from all individual participants included in the study.

To achieve the research goal, the questionnaire was administered. The questionnaire, developed by the authors of the article, consisted of 15 questions, which made it possible to identify problems during practical training in the conditions of distance learning, to determine the causes of their occurrence and the most effective technologies for their elimination. The content validity of the questionnaire is determined by the presence in the questionnaire of items aimed at checking all components of the phenomenon under study. The survey was conducted distantly with the use of Google Forms.

Results

The survey of future defectologists of NEFU and BSPU was conducted in order to identify the features of distance practical training and determine the effective technologies of its organization. To determine the differences between traditional face-to-face and distance practical training, respondents were divided into the groups according to the completion of practical training prior to the introduction of restrictive measures related to the pandemic. 67.5% (n=79) of the surveyed students had practical experience before switching to distance learning in Russian universities.

From March 2020 to February 2021, 81.2% of the respondents (n=95) had internship using distant learning technologies. Undergraduate students of BSPU were trained full-time in schools of Blagoveshchensk in accordance with the curriculum and agreements of the university with the educational institutions. Among the students who had internship using distance learning technologies, the majority (56.7%) were assigned to preschool organizations, and 35.6% – to secondary schools. Due to the epidemiological situation, students had the opportunity to practice at departments, centers for children with disabilities at universities, as well as in the capacity of volunteers (Figure 1).

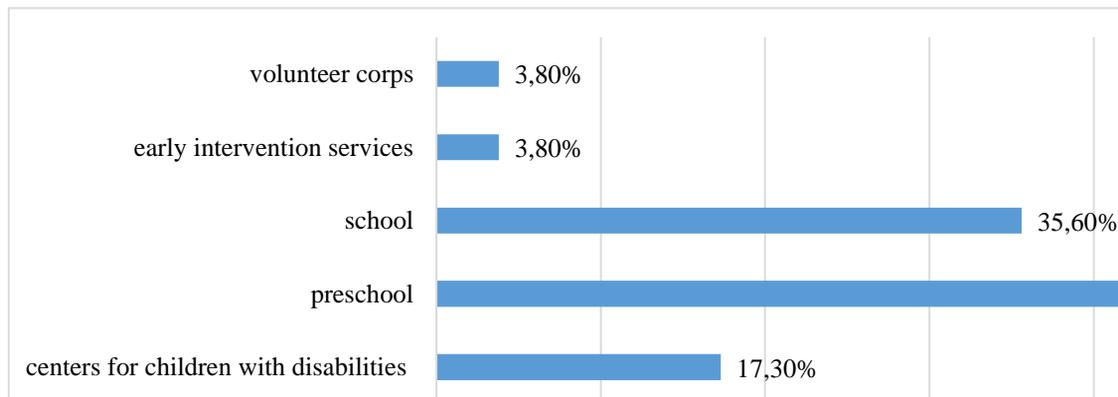


Figure 1. Practical training places for BSPU and NEFU students in the distance education (%)

Taking into account the distant mode of practical training, NEFU and BSPU updated the work programs of practical training by revising tasks and introducing innovative technologies.

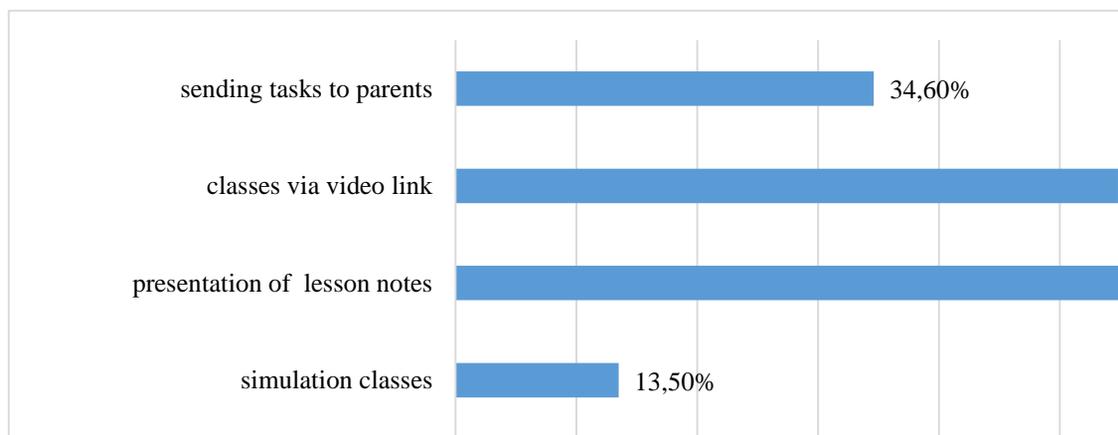


Figure 2. Updated tasks for practical training adapted for distance learning

The majority of respondents indicated the following changes in the tasks: the analysis of classes was changed to the analysis of video recordings of classes or situations, the conduct of classes – to the presentation of lesson notes, and face-to-face classes with children with disabilities were replaced by classes via video (Figure 2).

To conduct classes, the following services were most often used: Zoom (84.8%), WhatsApp (84.8%), and distribution of materials via email and Instagram posts. NEFU students also had the opportunity to study educational and methodological materials related to practical training and post reports through the online Moodle platform in the e-learning and distance learning system (<https://yagu.s-vfu.ru/>).

At the same time, the peculiarity of the practical training is that students should learn how to interact with children with various developmental disorders who find it difficult to communicate indirectly through computer technologies. Most of the surveyed students mentioned this as the main problem of distance internship (Figure 3).

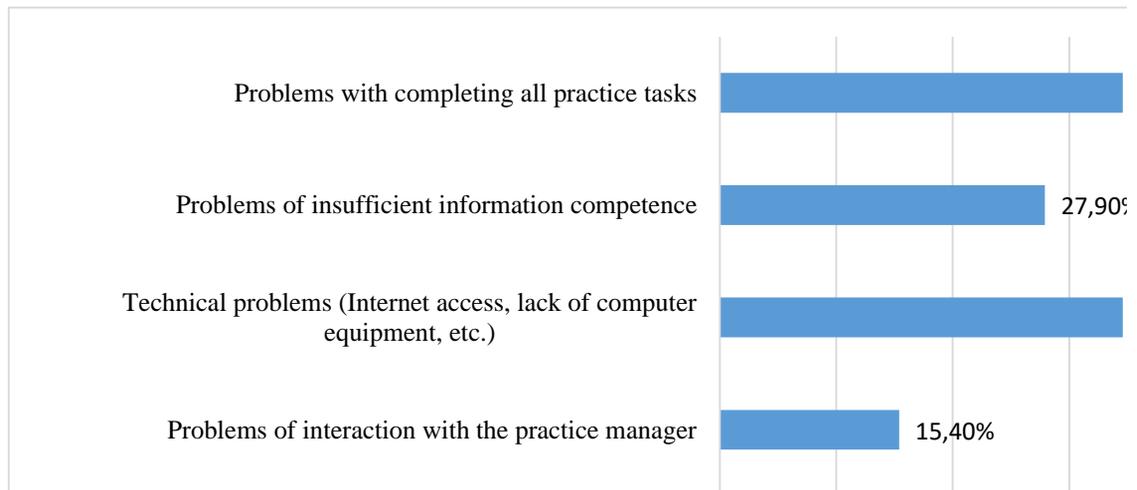


Figure 3. Problems encountered by students during distance practical training

Practical training includes tasks aimed at developing competencies in the field of psychological and pedagogical examination of a child with disabilities. Almost half of the trainees (52.4%) noted that they had conducted an online survey using video services, and the second half said that they had studied the materials of previously conducted diagnostics (Figure 4).

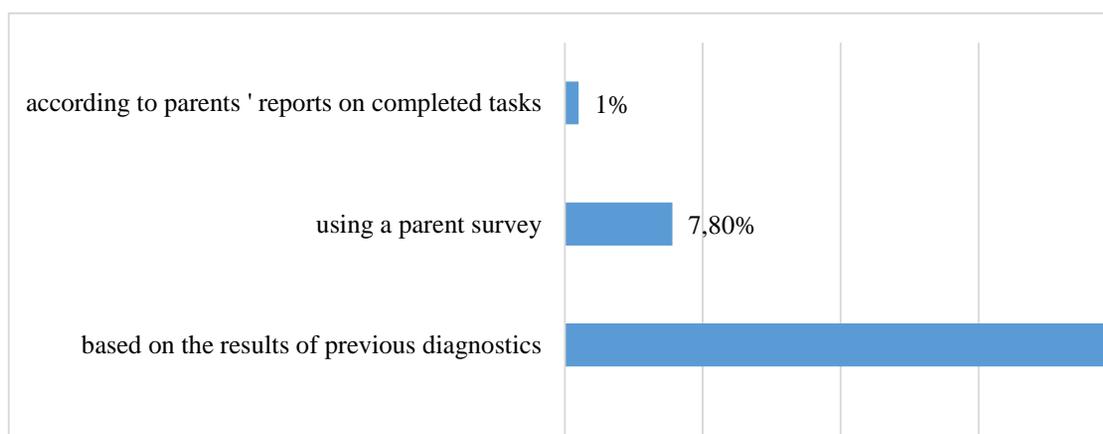


Figure 4. Forms of diagnostic examination of children with disabilities

56% of the respondents conducted classes with children with disabilities mainly online with the help of information and communication technologies. 45.1% of the respondents conducted classes offline, i.e. instructions were sent to parents or students for independent work.

Despite all the difficulties encountered during distance practical training, the students also noted several positive aspects related to the use of distant learning technologies (Figure 5).

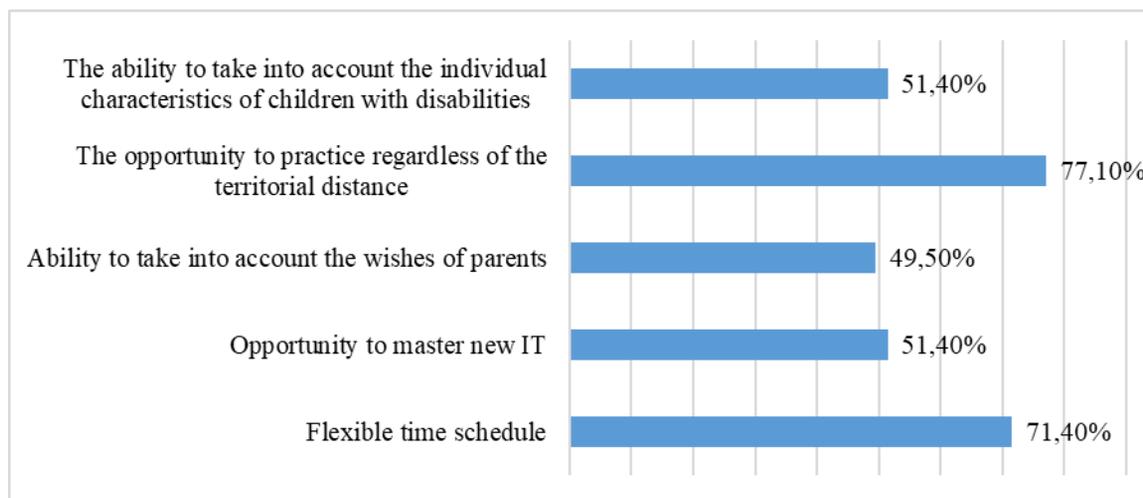


Figure 5. Positive aspects of distance practical training according to the students

The survey results revealed that despite the difficulties of completing internship in a distance mode, the appropriate preparation of the regulatory, organizational, educational and methodological conditions for practical training, students of the NEFU and the BSPU managed to fully complete their internship programs.

Discussion

The survey of students-future defectologists of NEFU and BSPU was conducted in February 2021, about a year after the Ministry of Science and Higher Education of the Russian Federation recommended universities to organize practical training of students using digital educational technologies outside the educational organizations because of the unfavorable situation caused by the new coronavirus infection. During this time, NEFU students majoring in “Special (Defectological) education” completed the following types of practical training according to the curriculum:

- training practices: research work (obtaining primary research skills), introductory practice;

- work placement internship: pedagogical and pre-graduate;
- practical training aimed at obtaining primary professional skills, including primary research skills (summer practice in an inclusive camp);
- practical training aimed at obtaining professional skills and professional experience: preschool educational organizations; speech centres at schools; summer practice in special (correctional) schools and special (correctional) schools for children with speech impairments.

To ensure the quality of training of future defectologists, extensive work was carried out on the transition to distance learning in both universities. This included the development of materials for electronic and distance learning systems, development of information technologies and digital communication tools by teachers and students, revision of teaching methods and the content of educational and methodological kits. This work was also carried out in terms of practical training of students. In addition, there was the need to review the content of practice tasks, taking into account the transition to a distance mode while ensuring the quality of practical training. This problem has become particularly relevant for educational programs that trained speech pathologists due to the peculiarities of children with disabilities for whom remote interaction is difficult.

In order to ensure the quality of practical training in the context of distance learning, introduction of innovative technologies was necessary. Based on the survey and analysis of the regulatory and educational documentation of NEFU and BSPU, the blocks of practical training were identified, in which innovative technologies were introduced (Figure 6).

As defined above, innovative technologies are a set of methods and tools that contribute to the implementation of a specific innovation, in this case, a distance learning system, including practical training of students.

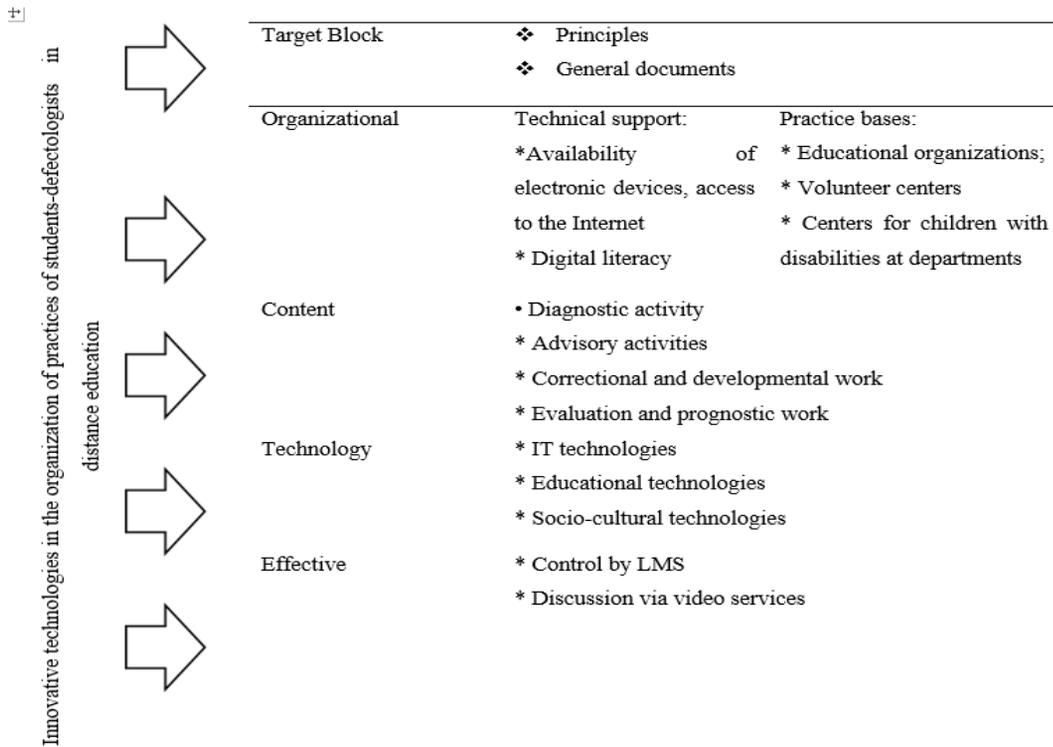


Figure 6. Innovative technologies used in the organization of distance practical training of students-defectologists

Based on this understanding of innovative technologies, in the target block of the organization of practical training, based on the requirements of the Federal State Educational Standard in the area "Special (defectological) education" (Federal State Educational Standard of Higher Education, 2015) and the realities of the distance practical training, the following principles of its organization were identified:

- 1) consistency and continuity;
- 2) integration of theoretical training in defectology and practical activities;
- 3) a combination of self-organization of students and pedagogical control based on constant feedback;
- 4) individual approach;
- 5) variability in the choice of content and forms of activity.

The target block also includes the regulatory and legal documentation on practical training which was revised in connection to the new realities. Relevant orders were issued on the organization of practices in the distance mode, and a lot of work was done on the preparation of educational and methodological documentation. As the analysis of the educational and methodological documentation on practical training of future defectologists in NEFU and BSPU showed, all the work programs of practices and evaluation (assessment tools) were updated in connection with the transition to the distance mode and approved at the meetings of the departments.

The organizational unit is represented by two components: technical support and practice bases. At the preparatory stage of the organization of practical training, an analysis of the technical support of teachers and students for the implementation of distance practical training was carried out: the availability of computer equipment, programs for video communication, access to the Internet, and digital literacy. According to its results, it was revealed that all students and teachers at NEFU and BSPU have sufficient technical equipment, and the level of information competence makes it possible to implement the internship program. According to the results of the survey, it was determined that during the practice, students also improved their level by mastering new programs and services.

In the context of restrictive measures, the organization of interaction with the education organizations became an acute problem since they were also forced to switch to distance learning, except for preschool educational institutions. Nevertheless, following the updated contracts on practical training with organizations, students were trained online in early aid service organizations, preschool educational institutions, general education and special (correctional) schools. Also, several students were trained in the capacity of volunteers in volunteer centers. They provided assistance to families with children with disabilities and elderly members of family.

In the context of the pandemic, one of the ways to solve the problem with the practice bases was the presence of centers for children with disabilities at the departments in both BSPU and NEFU.

The Centre for Psychological and pedagogical assistance to children with disabilities "Saydy" at the Department of Special (Defectological) Education of the NEFU Pedagogical Institute was established in 2014. One of the activities of the Centre is the creation of a scientific and practical base for the formation of professional competencies of students majoring in "Special (defectological) education" and "Speech Therapy". In practice, students provided remote psychological and pedagogical assistance to children with speech disorders and provided advice to parents on the organization of training and family education using cloud services.

The Centre for Intellectual and Creative Development of Children "Little Academy of Big Growth" has been operating in BSPU since 2015. The main activity is preparing children for school. In 2017, the Centre's children were joined by pre-schoolers with a diagnosis of autism and mental retardation. Accordingly, the opportunity to attract undergraduate students-defectologists to conduct scientific activities (diagnostics and correction) and organize pedagogical practice has also expanded. During the pandemic and in view of the impossibility of organizing distance learning for children with such a diagnosis, students-defectologists prepared tasks for children and provided methodological recommendations to parents using the Internet resources.

The content block of students' practical training is formed based on the components of psychological and pedagogical support for children with disabilities. At the diagnostic stage, as can be seen from the results of the survey, students conducted online diagnostics of speech disorders, analyzed the results of previous studies and also, conducted a survey of parents. Correctional and developmental work included conducting online classes, sending tasks to parents, simulation classes, and analyzing records and situations. For example, the analysis of classes of specialists in early aid services within the master's program "Psychological and pedagogical support of young children with developmental problems" was replaced by the analysis of video recordings of classes of speech pathologists with young children posted on the Internet. At the same time, to ensure high-quality performance of the task, students were asked to make a comparative analysis based on a special algorithm. Evaluation and prognostic work was carried out on the basis of the analysis of video and photo materials sent by parents.

The results of the survey allow to make a conclusion about the positive side of online psychological and pedagogical work with children with disabilities: the opportunity to consult parents on correctional and developmental work with children with disabilities, regardless of the territorial distance; the opportunity to actively use an individual approach in working with children with disabilities. This is especially relevant for the Sakha Republic (Yakutia) and the Amur Region where the studied universities are located, given their territorial peculiarity and low population density.

The technological block of the organization of practices consists of information and communication technologies, pedagogical technologies, and socio-cultural technologies, which were actively used in the conditions of distance practical training. Information and communication technologies include software and hardware, electronic devices for video and audio communication, Zoom, WhatsApp, email, Instagram, Moodle, and other services. At the training and production practices, the pedagogical technology of situation analysis for active learning was used. Students analyzed videos of classes and games with children with disabilities, discussed situations and cases.

Socio-cultural technology was used mainly in summer training and industrial practices during students' volunteer activities.

At NEFU, the analysis of the results of the practice was carried out using an online platform that hosts the NEFU e-learning and distance learning system. In addition, the practice reports were protected through cloud services in the form of focus group discussions.

Thus, innovative technologies used for the organization of distance practice, implemented in all the blocks of the practice, allowed providing high-quality practical training of bachelors and masters majoring in "Special (defectological) education".

Conclusion

In the course of the study carried out in two universities, NEFU and BSPU, that train defectologists for the Russian Far East, the features of conducting educational and industrial practices in the distance mode were identified, and the introduction of innovative technologies in the organization of distance practical training of future defectologists was justified.

The survey, which was focused on the use of innovative technologies, the attitude of students to the organization of practices in a distance format, the features of interaction with children with disabilities and their parents in the distance education, showed that the students were mostly successful in completing their practical training and did not experience significant difficulties. The use of innovative technologies in the organization of distance practical training of future defectologists makes it possible to achieve the planned results set by the Federal State Educational Standard of Higher Education (2015), develop students' professional competencies, and ensure the quality of training of specialists working with children with disabilities.

In the future, it is planned to develop a conceptual model of distance learning of defectologists, including various types of practices as well as practical classes in theoretical training disciplines in accordance with the Order of the Ministry of Science and Higher Education of the Russian Federation and the Ministry of Education of the Russian Federation of August 5, 2020 N 885/390 "On practical training of students" (Ministry of Science and Higher Education, 2020).

The results of the research can be used in the further study of the use of distance learning technologies in the training of future defectologists, taking into account the possibility of extreme events in the modern world.

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Competing interests

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