

Examining the optimal mixed system of inclusive education

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Abstract

The paper examines existing problems of inclusion and ways to overcome them in the context of a blended learning environment. The survey was conducted among 74 students with disabilities (7th and 8th years of study) in several schools in Samara, Russian Federation. The authors revealed a strong satisfaction with the blended learning program, as well as a number of related barriers that prevent children from receiving a secondary education. The recommended activities included: implementation of digital learning for these children, starting from preschool education; improving the ethical and professional skills of teachers who work with students with disabilities; engaging parents in the learning process, etc. The paper can be used as a prototype for the implementation of similar blended learning programs in schools for children with disabilities, as well as in future research on the digitization of inclusive education in Russia.

Keywords: barriers, blended learning environment, children with disabilities, disabilities, learning.

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1. Introduction

Contemporary society has enshrined many fundamental human rights and freedoms, which have become the basis for its development. The right to education is no exception, being an indispensable element in the existence and evolution of the state. Such right has been developed since the adoption of the Universal Declaration of Human Rights, which enshrined each person's right to education, the free primary and general education, its affordability (UN General Assembly, 1948). However, the extent of its implementation depends on a large number of factors.

Being among such facts, blended learning is at the forefront, placing high demands on students' self-regulation skills and, therefore, posing a major challenge for people with disabilities (Van Laer & Elen, 2017; Hurts, 2015). In response to the COVID-19 outbreak, online learning seemed to be the only solution for the education sector, while face-to-face learning was put on hold (Yu et al., 2022). Educational institutions around the world have reconsidered all the risks and opportunities which online learners face (Hart et al., 2019). This is especially true for individuals with specific educational needs (Marks et al., 2016). Yet, to minimize the disadvantages of online learning, a blended learning format was introduced, combining the principles of online and traditional learning. This, in turn, makes it possible to continue educational activities in a face-to-face format and at the same time maintain the social distancing requirements established during the pandemic (Kavakoğlu et al., 2021; Aleshkovsky et al., 2020). When it comes to this category of people, the question of introducing cutting-edge learning technology, which must meet the disabled persons' needs, is raised (Jackson & Lapinski, 2019). Introducing new learning environment, which includes information technology, will make it possible to materialize most opportunities for people with disabilities (Laine et al., 2017). Meanwhile, the new learning environment is directly shaped by the pressures of pandemic-related restrictions introduced as part of safety measures, and at the same time such environment drives the global digitization.

1.1. Related Research

Blended learning approaches, as well as inclusive education can provide students with additional opportunities. However, such approaches can also lead to unforeseen and unmeasurable barriers, which, in turn, will require large adjustments to learning and teaching approaches (Suhirman et al., 2014). The blended learning and inclusive education concepts should be differentiated because the latter is based on the principles of social equality and takes into account the diversity of the human race, regardless of the resources' format (Pearson et al., 2019; Bailey et al., 2015). Disadvantages (barriers) might include absence of IT specialists, education computerization costs, as well as the poor digital learning infrastructure in the Russian Federation (Bagdasaryan et al., 2021).

Furthermore, the human factor that is inherent in educational services provided by instructors should be taken into account. This aspect addresses the issue of academic values, which are very important in teaching (Palahicky et al., 2019). As such, the introduction of inclusive education in the 21st century inevitably entails problems faced by instructors who need to adapt teaching methods to different technologies and groups of learners (Bagon et al., 2018; Yakovleva & Lysova, 2020; Mbale, 2014; Round et al., 2016). Although the educator's role in building the learner's knowledge is important, online learning, which is possible solely in the blended learning format, is more effective than traditional teaching methods, as corroborated by experiential research (Vaishnav & Singh, 2019).

The advantage of blended learning can be directly attributed to its flexibility, independence in variations of learning models. In turn, available studies have suggested that students in the blended learning system performed better than those who were trained under the traditional system (Jeffrey

et al., 2014). This approach relied on the students' self-organization and time management skills, as well as integrating usual learning processes with information technology and digitization. Yet, similar practices have been investigated in Russia, with measurement of the blended learning effectiveness (Bakhilova & Kiseleva, 2018; Li & Chang, 2019). Free platforms (Microsoft Teams, Zoom and Google Meet) are most popular in Russian secondary schools.

Yet, the aspect of inclusive education quite often comes up on the agenda even when there is no direct allusion to the child's special needs (Cocquyt et al., 2017). Quite often this requirement is attributed to the learner's psycho-emotional aspects rather than to health. This, in turn, places more emphasis on the instructor's proficiency rather than on the school infrastructure (Mikhailchi, 2021).

However, despite this, inclusive education in many ways depends not so much on the government's willingness to introduce it into the existing educational system, as on the willingness (readiness) of students and instructors themselves to implement the inclusive education (Rasmitadila et al., 2020). Therefore, in recent years, introduction of an optimal inclusive education in Russia has become a pressing issue due to the large number of students in need of such inclusion. More specifically, research conducted during the COVID-19 pandemic suggests that, on average, approx. 10% of students with disabilities in Russian schools require inclusive education. According to psychologists, and with the existing educational infrastructure of the Russian Federation, the number of students with disabilities in a traditional group of students should not exceed 3 (Dzotsoeva, 2021). As a result, mainstreaming of the blended learning environment for students with disabilities, especially in the transitional post-COVID-19 period, becomes a way to overcome barriers encountered by such learners in exercising their fundamental rights to education and effective personal development.

1.2. Purpose of the Study

The current study identifies the optimal blended learning system for children with disabilities in Russia in the context of transformation of traditional education due to the COVID-19 pandemic. In order to reach these goals, the following tasks need to be performed:

- 1) analysis of the specific nature of inclusive education for Russian schoolchildren;
- 2) developing a program to improve the learning for Russian students with disabilities;
- 3) determining an optimal way to implement a blended learning format for children with disabilities to replace the traditional system.

2. Method and Materials

2.1. Research Model

The survey was conducted to confirm the hypothesis of blended learning optimality for students with disabilities, with full replacement of the traditional education system. With the education sector's overhaul due to the pandemic, adapting to the new environment makes more sense.

The blended learning program, which was proposed by the authors, included wireless digital teacher-student communication tools that would be convenient and affordable in the Russian Federation. The program was in effect for 2 months of the 1st semester in 2021-2022 academic year. Technological tools provide not only the appropriate information to enable the digitization of learning, but also the ability to conduct a particular class (perform a particular task) online. Therefore, the program provided for predominantly online communication among students, split into groups of 3-4 persons, taking into account their characteristic features and learning requirements. The chosen platform of Google tools was the main communication suite in learning. Google Meet was used to

conduct lessons three days a week. Homework was done using other Google tools (Google Disk, Google Sheets, Google Docs), which provided access and improved controls over respondents' activities. Google Classroom is the most important tool for control and identification purposes, where a group was created for each class, and instructors were able to give memorization exercises for students and corrected them in real time. Instructors who taught more creative classes were given a free choice of how to teach the course content. The suggested widgets also included Canva graphics app and YouTube. The remaining 2 days per week were used for instruction in more verbal and creative disciplines, attended by the entire group of respondents, according to the school curriculum (physical education, music, visual arts, etc.). Upon completion of this program, a survey was conducted to determine the program's optimality, as well as further prospects for its implementation in the Russian Federation.

2.2. Participants

The sample of respondents consisted of 7th and 8th year students from five schools in Samara, Russian Federation: Perspektiva Gymnasium, School No. 176, Gymnasium No. 3, Nayanova Academy for Gifted Children, and Gymnasium No. 1. 7th and 8th year students were selected because knowledge learned during this period is most important in the Russian secondary education. The initial sample of all students in the selected classes amounted to 657 persons. After processing medical information about each student, 74 students with disabilities were selected and included into the original study sample (35 girls, 40 boys, with the mean age of 13.8 years).

2.3. Data Collection Tools

The questionnaire (developed by author) included 8 author's questions (Table 1). The questions were designed for students with disabilities who gave their answers together with their parents (or independently wherever possible) based on the Likert scale. The questionnaire was tested using Cronbach's alpha. The interpretation of Cronbach's alpha values is as follows: >0.9 excellent; >0.8 good; 0.7 acceptable; 0.6 questionable; and >0.5 poor (Gliem, Joseph A., and Rosemary R. Gliem, 2003). The cumulative Cronbach's alpha value for the questionnaire was 0.92 with values of 0.92, 0.95, 0.93, 0.96, 0.87, and 0.94 for the six dimensions in the order they were mentioned above. Conclusion - the questionnaire is reliable and can be used for interviewing.

2.4. Data Collection Process

The questionnaire was posted on Google Forms and sent to students' emails. The questionnaires had to be filled in within 2 weeks.

Table 1. Questionnaire (n=74)

1	Has the program improved your learning experience, and by how much?	1° 2° 3° 4° 5°
2	How comfortable are you with the blended learning format (3 on 2)?	1° 2° 3° 4° 5°
3	How satisfied are you with the quality of knowledge delivery/learning in this academic program?	1° 2° 3° 4° 5°
4	How well does the instructors' professional expertise match the blended learning program?	1° 2° 3° 4° 5°
5	Evaluate the interplay of the program's selected digital tools as learning apps for presenting information	1° 2° 3° 4° 5°
6	Would you like to continue learning in this form?	Yes / No
7	What is the key learning challenge for you (and does our program address that challenge)?	
8	Describe your experiences with blended learning	

2.5. Data Analysis

For the results' interpretation, cross-sectional descriptive and comparative statistical analysis methods were chosen. Statistical data processing was performed in the Statsoft Statistica V.6.0. The significance of differences was measured using Fisher's t-test (significant at $p \leq 0.05$). To estimate the parameters of the mediating variable, the analysis was performed at a 95% confidence interval.

2.6. Research limitation

The survey was conducted among a small sample of respondents, each with specific characteristic features and requirements for the learning process. The study was conducted at schools in one of the Russian cities, so it cannot be extrapolated on a global scale. The suggested program was prototyped on the basis of specific educational institutions' capabilities and can be adjusted in the future.

2.7. Ethical issues

All respondents (students with disabilities and their parents) were informed and agreed to participate in the study. All school directors and administrators have also agreed to implement the program during October-November 2021-2022.

3. Results

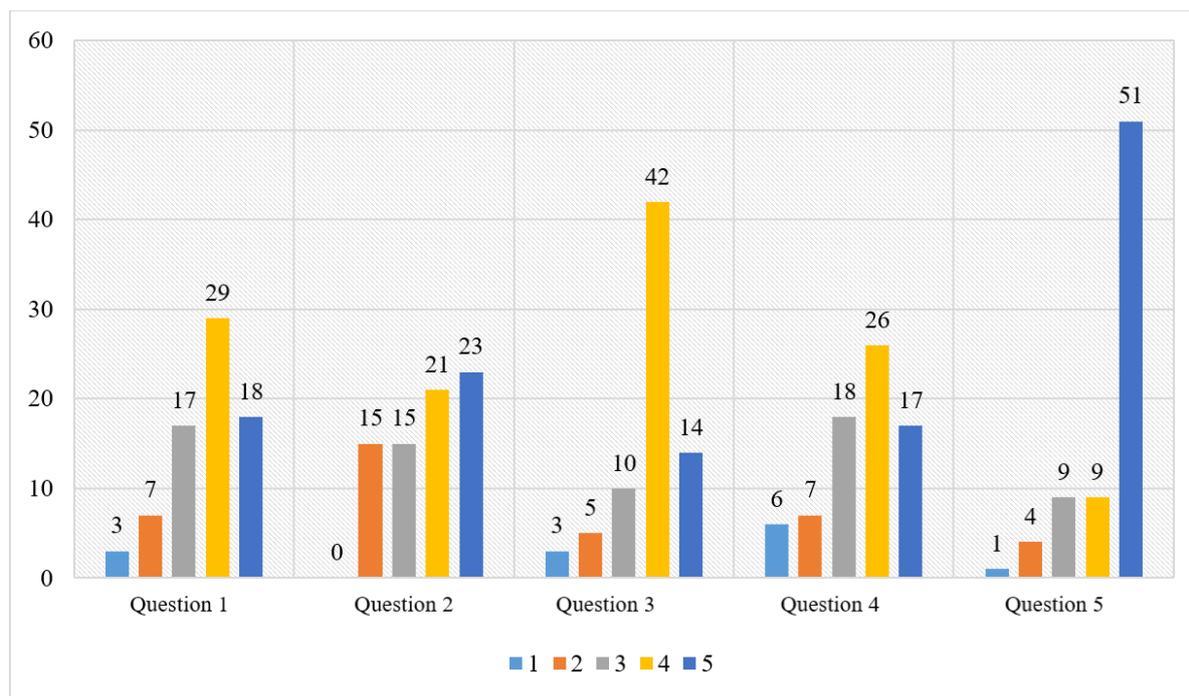


Figure 1. Survey outcomes - questions 1-5

Hence, the survey outcomes demonstrate an overall student satisfaction with this format of instruction (Figure 1).

63% of respondents reported positive changes that impacted their perceptions regarding learners with disabilities. The blended learning format (2 days of face-to-face classes and 3 days of online classes) was convenient for most students, while none of the respondents strongly disapproved of such schedule. This suggests that the balance between face-to-face and online learning supports both the communication-related and feasibility aspects of inclusive education.

It is very important to mention that the compromised quality of course content and learning resources (widely regarded as one of the disadvantages of online learning) was not observed in the context of this survey. 14 students (20% of their total number) did not notice any difference, while 56% of students reported little change. This might imply that the overhaul of the learning process (both during and after the pandemic) for students with disabilities is significantly less painful in the learning quality context, suggesting the optimality of relevant decisions. Yet, the chosen tools were optimal for almost 70% of respondents with disabilities (question 5, Figure 1)

Yet, quite interesting were the answers of respondents regarding the instructors' professional expertise, as this aspect is quite important for ensuring the quality and ethics of inclusive education in the Russian Federation. The respondents believed the instructors' expertise was insufficient for the effective harnessing of the blended environment in inclusive education (see question 4, Figure 1) Based on the survey outcomes, instructors' professional development is one of the pressing initiatives to ensure effective education for Russian students with disabilities after the pandemic.

Given the free responses of sample members (questions 6-8), a diagram (Figure 2) was developed to showcase the key problems faced by students with disabilities during the blended learning practices. The survey pointed to the lack of inclusive training programs for the instructors, which results in the instructors' poor skills in this aspect. Almost a quarter of the respondents reported poor resources as an important barrier to the implementation of inclusive education in the Russian Federation. Respondents mention the following aspects as much less important: heavy teaching load, unpreparedness of students with disabilities for traditional instruction, and a significant number of unwritten rules.

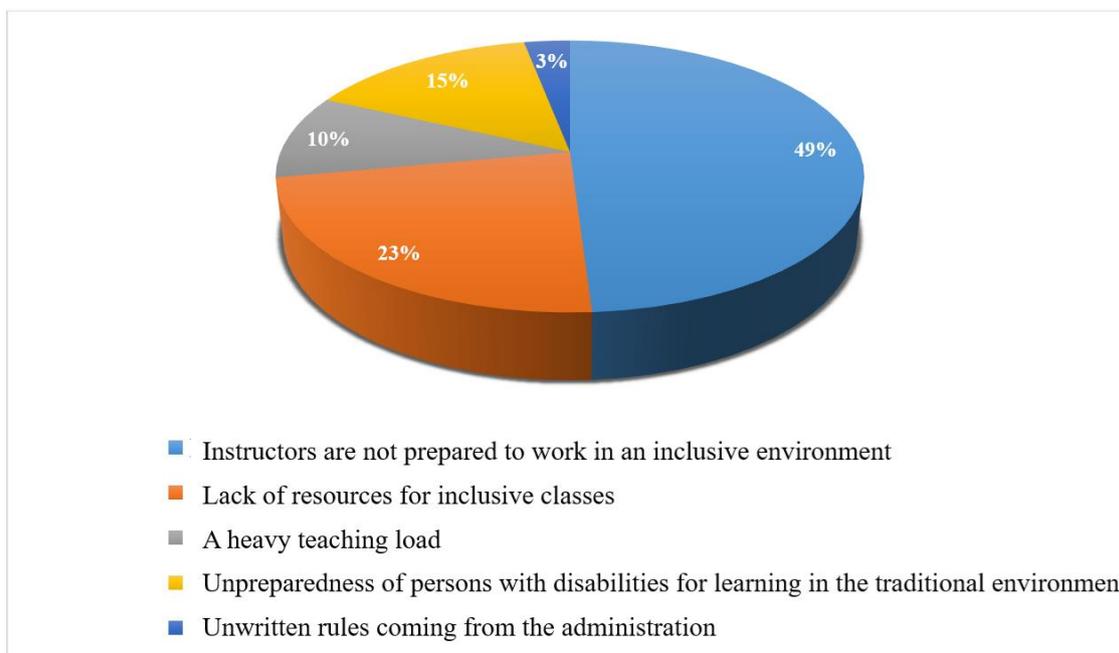


Figure 2. Problems of inclusive education encountered by respondents when implementing a blended learning program

Yet, more attention should be paid to these unwritten rules affecting the moral and ethical aspect of inclusive education in Russia. Although only 3% of respondents reported the morphology of such

rules' applicability within the current study (Figure 2), this issue remains quite important in Russia. Problems arising in terms of exercising each student's right to education include: discrimination against students on the basis of gender, race and other characteristics; instructor's insufficient expertise in communication with children with disabilities; instructors' failure to follow the humanism principle; violation of the rules for communication with students with disabilities, etc. (Stepanova et al., 2022).

Therefore, the survey outcomes were used to arrange the system for solving the issues of interplay between inclusive education and blended learning to improve them in the Russian Federation (Table 2).

Table 2. Main approaches to solving the issues of inclusive education

Problem	Solution
Students with disabilities are not ready to study in a general education institution.	Set-up of adaptation groups in educational institutions, relevant preparations starting in kindergarten.
Insufficient expertise of instructors teaching in an inclusive environment.	Adopting regulations regarding training of instructors for inclusive programs. Establishing communication between preschool, general education, and higher education institutions on inclusion-related issues.
The teaching load of instructors who have to adjust their programs for several categories of students at once.	Assigning a tutor (assistant) to each instructor (working with students with disabilities), whose task is to help the person with disabilities to overcome the difficulties in the learning process, which might require a personalized approach from the instructor and a departure from the overall lesson plan.
Lack of resources for persons with disabilities.	Designing strategies to develop the educational institutions' infrastructure, providing them with resources (e.g., the Internet) necessary for the normal education of persons with disabilities.
Unwritten rules, coming from the educational institution's administration.	Introduction of a mandatory system of accountability of educational institutions to higher-level authorities in matters of inclusion, review of the implementation of inclusive programs by educational institutions.

4. Discussion

Foreign researchers often refer to the educational institutions' autonomy in matters of inclusion. When it comes to methods and ways, D. Munk and T.L. Dempsey (2019, p. 56) believe that it is essential for the educational institutions' administrators to control the inclusive environment and to develop methods for training inclusive staff. Unfortunately, it is hard to agree with this opinion because this would destroy the inclusion controls. Development of programs and methods of inclusive education (standard provisions), as well as the approval of staff training principles should remain the exclusive competence of state authorities in the education sector.

When it comes to the Russian Federation, ratification of the Convention on the Rights of Persons with Disabilities ensures close interaction between the state and educational institutions in securing equal rights and freedoms for individuals regardless of their health status (Garant-Service, 2022). The International Classification of Functioning, Disability and Health defines people with disabilities with the so-called umbrella term for impairments, limitations in activities or participation that reduce the

quality of their lifestyles, creating various barriers to full inclusion in the social context (World Health Organization, 2001).

Case studies of Russian educational institutions demonstrate poor readiness of kindergartens to effectively implement inclusive education. Russian researchers pointed to the unsatisfactory structural and teaching environment for children with psychophysical developmental disorders, based on the findings of a case study of 4 educational institutions. They found that a number of barriers to inclusive preschool education had not previously been discussed publicly. Some of such barriers included: parents' unawareness of their children's physical and moral development; inadequate communication between instructors and children with disabilities; insufficient professional expertise among instructors, etc. Given the findings of the current article, it can be argued that the key factors of dissatisfaction with education are the lack of teachers' competence in the context of effective inclusive learning and the moral discomfort of students. Most educators and parents are not familiar with the development standards of a child with disabilities, and inevitably cannot secure an effective learning process (Bratkova et al., 2020).

When it comes to the forms and methods of teaching people with disabilities, many psychologists adhere to the theory of cognitivism. The approaches of mapping, collaborative learning, and flowcharts dominate among the methods of inclusive learning. Students should understand how they think, thus gradually develop own learning and perception skills (Al-Shammari et al., 2019; Korsgaard et al., 2020). Instructors and tutors make up the foundation for the inclusive education, and it would be totally wrong to call them mediators who only arrange activities and set up training (Al-Shammari et al., 2019). Given the findings, the tutor's importance in ensuring optimal student attitudes was also found to be high, especially with regard to the learning environment using digital tools. Such argument is based on the fact that the instructors determine such parameters as motivation to learn, the quality of information, adaptation to learning, an enabling learning environment. H. Hafiar, P. Subekti and A.R. Nugraha argue that, although innovative technology has advanced far enough, persons with disabilities cannot always access such technology independently due to their physiological development (Hafiar et al., 2019, p. 201). To some extent, students discover independent learning on their own (Foulis, 2017, p. 153), but the instructor's role, above all, is to encourage and control such learning, and, consequently, higher standards of instructor's competence.

An increasing tendency to move away from the standardization of forms and methods of teaching is being observed in today's learning environment. Some studies discuss such approach within the context of inclusive education. Teaching is based on the differentiation of the learning process, the quality of teaching and the instructor's feedback (Altemueller & Lindquist, 2017). Other studies discuss the paramount role of auxiliary technologies for teaching people with disabilities and the principles for their selection, depending on individual needs, and above all, the learning achievements. Furthermore, for successful implementation of relevant technologies, it is important to answer the following three questions: a) what works? b) how it works? c) under what conditions it works? (McCrea, 2014; Vincent, 2019). This study discusses the need to equip the student's workplace with special tools. On the other hand, the reviewed studies address the quality of blended learning in general, as well as the technology used in such learning. The authors focused on school-based adaptation classes, because this approach is closer to the attitudes and technology prevailing in Russia, while best practices require learning and adaptation on the spot (Sharma et al., 2015; Ip et al., 2016). At the same time, the study revealed a number of additional risks that arise in the springboard of mass implementation of mixed inclusive education - most of them are related to the low level of

resources in many educational institutions in Russia. For example, respondents noted that a significant number of training educational platforms remain inaccessible in the Russian Federation.

Hence, addressing inclusive education in the Russian Federation requires looking into important barriers that can be partially eliminated by the implementation of blended learning to replace traditional education. Institutional achievements in Samara show mixed and looped results. At the beginning of the academic year, the traditional format of learning showcased increased levels of oxytocin (the 'happy hormone') among almost all of the surveyed students with disabilities. This suggests the need for a communicative and socialized learning environment for people with disabilities to improve their feelings by increasing the 'happy hormone' levels. Later on, approx. 35% of students reported stress that got worse by the beginning of the first finals. Frustrations attributed to interpersonal interactions with the learning process participants (more specifically, fellow students and instructors), which are exacerbated in the course of face-to-face classes, are particularly important for developing well-being of such respondents with disabilities (Sinkovskaya & Malimonov, 2021).

Rounding up the discussion of inclusion, one of the alternative ways to make the instructor's lives easier should be mentioned. At this point, the concept of inclusion is often equated with personalized learning programs. A. Kartika et al. (2018, p. 682) argue that now such programs place a burden on instructors, primarily because it takes approx. 10% of total teaching load to fill in the documents for such programs, with shortages of inclusive education professionals (Young, 2017; Adams et al., 2018). However, given the results of the current study, the technological support of the learning environment is a less significant determinant of inclusive education than the professional competence and experience of teachers.

5. Conclusions

Contemporary development of inclusive education tends to streamline general educational institutions to give children with disabilities the opportunity to study at their places of residence with other children. Inclusion is based on the recognition of and respect for individual human rights. Studies conducted at 5 schools in Samara (Russia) demonstrate the optimality of blended learning for 7th and 8th year students with disabilities, with a particular effectiveness of such blended learning system amid global overhaul of the educational settings in connection with COVID-19. The implemented 2-month training program for such students demonstrates an overall satisfaction therewith. Well-rounded, free and easy to use digital tools, as well as the ratio of online and face-to-face classes (3 to 2) proved to be optimal. The main problems mentioned by 49% of the respondents as barriers to the effectiveness of their secondary education included lack of instructors' expertise in facilitating and motivating such specific learning. The recommended activities included: implementation of digital learning for such children, starting from preschool education; improving the ethical and professional skills of instructors who work with students with disabilities; engaging parents in the learning process, etc. The paper also addressed the optimality and effectiveness of the blended learning environment for children with disabilities to balance between feasibility issues and children's socialization needs. R&D, particularly in terms of digitization, allows people with disabilities to adapt more flexibly to traditional learning formats. Yet, mainstreaming the online learning during the pandemic and its implementation in a less aggressive blended format later on seems to be a more realistic paradigm for the Russian Federation.

Overall, the study addressed the existing issues and prospects of inclusive education. Further research in this area might focus on the resources for inclusive classes.

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