Blended Learning Environments in Inclusive Education at the University

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Abstract—The modern education system in most countries is built on providing equitable education opportunities to all people, regardless of the limitations they have. There are no significant problems in primary and secondary inclusive education, while most traditional higher education models are not sufficiently adapted to the needs of people with learning disabilities. Thus, it has been replaced by a blended learning model built on new digital learning environments in recent years. The aim of the article is to study the blended learning environment of inclusive education systems in China and Russia. The article presents the findings of a "The Global Learner Survey", conducted on behalf of Pearson in May 2019 by The Harris Poll. The survey involved over 11,000 learners aged 16-70 across nineteen countries. Additionally, statistics on the higher education development in Russia and China were used. The analysis of the current state of higher education in Russia and China, as well as the development of a blended learning environment, shows the positive effect as that it allows students with limited educational opportunities to integrate into the educational and public life of the university and implement all types of rehabilitation along with the educational process.

Keywords—Blended learning environment; equal opportunities; inclusive education; persons with disabilities; prospects; system; teaching

1 Introduction

A feature of modern life is the increasing rates of change in various human activities. Each new generation, from the moment of birth, is immersed in intensely changing living conditions, which will certainly affect the way of human development and formation [1]. Informatization of society powerfully pushes the development of innovation in the educational process of universities. Teaching goes to a different level, as

new technologies appear to optimize the educational process mainly by reducing work in classrooms and increasing students' independent work, while trying to improve the quality of education [2].

Higher education institutions have realized that preserving past learning and teaching practices does not meet the needs of a 21st century student [3,4]. Many universities and colleges today use online and/or blended learning for most courses offered [5,6].

Blended learning is a combination of online teaching methods that use electronic communication technology, online teaching materials and traditional classroom teaching methods that are tied to a specific location [7]. Blended learning, also called hybrid learning, combines the best of traditional learning with the benefits of e-learning to provide personalized, differentiated learning for a group of learners. Students enrolled in formal blended learning programs partly study online, but have the benefits of full-time study and supervision, which maximizes the effectiveness of training and meets their own needs [8].

Blended learning also allows teachers to spend less time on lessons for the entire class and devote more time to communication with people who have special educational needs, work with these students either individually or as part of small groups, help them with specific concepts, skills, questions or learning problems [9].

Blended models of learning get increasingly popular. Such learning environment provides combination of different online and face-to-face learning activities [10]. However, the issue of its definition makes it difficult to develop blended learning as a field of research and practice [11].

Thus, the current definitions and taxonomy of blended learning include a wide range of learning methods within offline and online modes as well as pedagogical approaches between student-cantered and teacher-cantered [12].

The Clayton Christensen Institute has created the most comprehensive online environment in which funds for blended learning have been raised. This is called The Blended Learning Universe or BLU. The following definition for blended learning is proposed. These are educational programs in which a student has the following opportunities:

- Studying at least partially online, independently controlling the time, place, method and pace of learning
- Studying (at least partially) in a specially equipped location outside the home
- Learning conditions of each student in a single subject or course provide an integrated learning experience (Fig. 1)
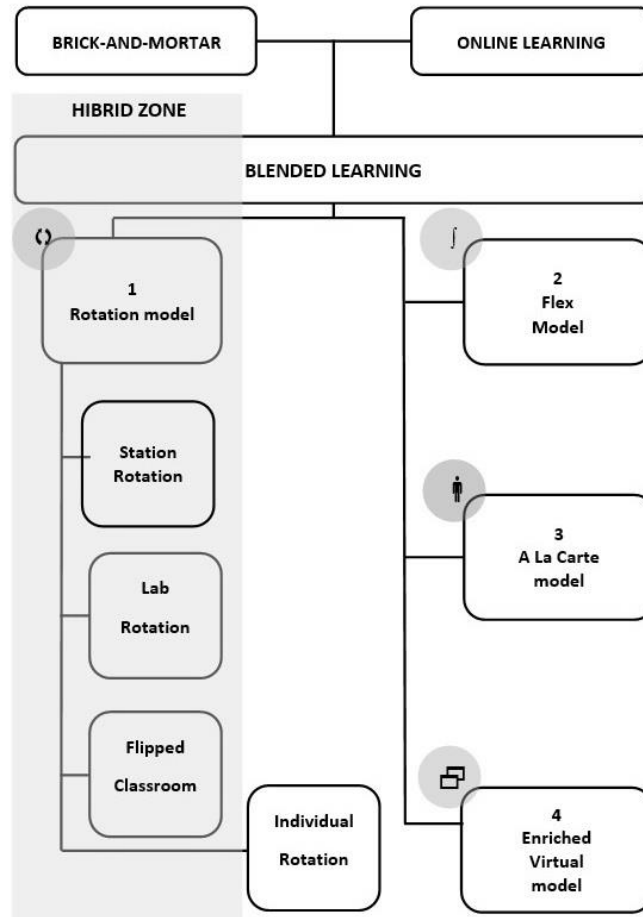
Fig. 1. Models of blended learning.

Reference: Created by authors based on [8,13,14]

One of the added benefits of blended learning is that it guarantees quick feedback through regular online interaction [15]. A further potential benefit of blended learning is the additional opportunity for peer and tutor interaction through online discussion [16].

Guaranteed inclusion in higher education protects the rights of students who have certain disabilities [17]. Complexity, multidimensionality, and problematic nature of inclusive education might not be ignored until a person faces its practical consequences [18]. Inclusive education has become a global movement due to an increased advocacy for children's educational equality mainly for students who are viewed by educational systems as different [19]. Inclusive education offers involving all people in the process of realizing democracy, justice, and educational diversity [20]. Inclusive edu-

cation increases the potential of the education system so that it can truly reach everyone who wants to study [21].

Inclusive education is an approach that values diversity as an integral part of the teaching and learning process that contributes to human development [22]. Inclusion can be seen as a process of meeting the needs of different groups of students through their wider involvement in different cultures, communities, learning process and reducing any forms of isolation in the educational process [23]. Inclusive education has been developed and implemented to educational institutions as an important element of access to higher education for everyone [24].

Many nations support their definition, which emphasize inclusive education as an important premise in order to secure equal educational rights for all students [25]. For more than two decades, inclusive education has been used in China, and in a unique format that is specific to Chinese economy, politics and culture [26].

The message of inclusion is evident in all of the Chinese Professional Standards for Teachers with words such as respect, equity, and diversity repeatedly used throughout the documents and linked to words or phrases such as every/all students, appropriate education, and holistic development of the child [27]. In China, the rights of people with special needs are equally protected under the law. Recently, the government of this country has revised a special Regulation on the Education of Persons with Disabilities. The education of such people was included in the Outline of China's Plan for Medium and Long-term Education Reform and Development (2010-2020), "China's Education Modernization 2035", "Plan for Promoting Equal Access to Basic Public Services in the 13th Five-year Plan Period", and in two phases of the "Special Education Promotion Plan". All of this is designed to improve inclusive education [28].

From 2012 to 2018, a total of 62,200 students with disabilities were enrolled in regular institutions of higher education in China [28].

To provide more opportunities to students with disabilities, the Ministry of Education has ratified 22 higher education institutions to organize exams for them, and distinguished their admission plans from regular admissions. The state encourages institutions of higher education to open disciplines on special education. By June 2018, 61 colleges and universities with regular four-year undergraduate courses were running disciplines on special education, with some 10,000 students [28].

The Russian education system is developing dynamically, considering needs and conditions faced by students and graduates [1].

The inclusive education in Russia is a new system in which students and teachers work to achieve a common goal of affordable and quality education for all children without exception. The Law of Russian Federation "On Education in the Russian Federation" includes the definition of "inclusive education" as a system that provides all students, taking into account their various special educational needs, with equal access to education and upbringing. The term "student with health problems" means "a person who has problems of physical and (or) psychological development, confirmed by the psychological, medical and pedagogical commission and needs education with creating special conditions" [29].

The inclusive education system in Russia has a number of problems:

1. Teachers' lack of knowledge in the field of special education aimed at training of children with disabilities.
2. Financial problems
3. The weak motivation to support disabled students. This problem is caused by the value orientation of modern teachers who focus on talented children and reject some children with special needs [30].

Nowadays, in the 21st century, it is important for ideas and policies regarding inclusion to move forward and cover a wide range of issues related to education, society, identity and belonging.

The consensus among this research is the benefit of a blended model of learning for students with special needs [31].

Teachers and government officials from all over the world should work together to promote and support education plans that address the positive aspects of inclusive education [32].

The aim of the article is to study the blended learning environment of inclusive education systems in China and Russia.

2 Materials and Methods

2.1 Research design

The article presents the findings of a The Global Learner Survey", conducted on behalf of Pearson in May 2019 by The Harris Poll. These data were taken for a more complete analysis of modern world trends in education, as well as its problems and prospects in the development of digital technologies and e-learning. We also used the data on the development of higher education from "Federal State Statistics Service of Russia" and "National Bureau of Statistics of China" official websites. The quantitative indicators of the analysis of the structure of higher education for individual types and forms of training were used in course of analysis.

2.2 Sample

The survey involved 11083 people aged 16 to 70 years. The survey was conducted in 19 countries of the world (Table 1). The choice of countries for the survey was aimed at covering of the main continents and the most populated countries of the world. The survey data were specifically considered by age, gender, region, urbanism, race / ethnicity, education, marital status, household income, and socioeconomic status to bring respondents in line with actual range to the respective countries.

Table 1. Characterization of the sample

Markets	Sample Size	Margin of Error
Global	n=11,083	+/- 0.90
US	n=1000	+/- 3.00
UK	n=1001	+/- 3.00
Australia	n=1000	+/- 3.00
Canada	n=1001	+/- 3.00
South Africa	n=1001	+/- 3.00
Brazil	n=1000	+/- 3.00
China	n=1000	+/- 3.00
India	n=1000	+/- 3.00
Europe excl. UK (Italy, Spain, Germany, France)	n=1004	+/- 3.00
Hispano-America (Mexico, Argentina, Colombia)	n=1043	+/- 2.94
Middle East (UAE, Saudi Arabia, Turkey, Egypt)	n=1033	+/- 2.96

Source: Created by the authors

The selection of respondents was based on their age and the quality of the answers received from leading research groups working online. A 20-minute online survey was used.

2.3 Research limitations

The study was based on statistical data from a survey that covered key trends in the development of education worldwide in 2019. They included traditional education and new approaches using digital technologies in higher education. To assess and compare the current state of higher education, we used individual data from the state statistics services of Russia and China.

3 Results

The blended learning environment in higher education, especially for its inclusive direction, is required as the society willing to respect the people's rights and provide equitable access to education for everyone without restrictions.

The higher education system in the Russian Federation includes such levels of education as bachelor's degree, specialist degree, master's degree in three main forms: full-time study; part-time evening; and part-time extension-correspondence programs.

A study of the statistical data on the current state and dynamics of traditional and blended education in higher institutions of the Russian Federation indicates significant changes, due to the ever wider spread of digital technologies. Those changes are also determined by other factors, such as the development of new educational opportunities, including those related to inclusive education, as well as increasing competitiveness among higher education institutions.

In 2018, 25.2 thousand persons with disabilities had studied higher educational institutions and scientific organizations in Russia that's almost 0.6% of their total number (Table 2).

Table 2. Distribution of students by levels, and specialty areas in higher educational institutions and scientific organizations in Russia, in 2018, people

Specialty area	Total students in all courses	
	Total	*Disabled people, physically challenged, children with disabilities*
bachelor's degree, - total	2796244	17783
specialist degree - total	746600	5840
master's degree - total	525483	1629
Total under bachelor's degree, specialist degree, master's	4068327	25252

Source: Created by the authors using information from the Federal State Statistics Service of the Russian Federation

Thus, the largest number of disabled people and children with disabilities studied bachelor's degree programs - a total of 17,783, the smallest master's degree programs – 1629, respectively.

Analyzing the structure of inclusive education among people with special educational needs (SEN), physically challenged and children with SEN in the higher education institutions and scientific organizations of the Russian Federation, then in 2018 students with SEN and physically challenged dominated (Table 3).

Most students of inclusive education studied bachelors and specialist degree programs, while there were significantly fewer master's degree students.

Table 3. Students with SEN and physically challenged in the higher education institutions and scientific organizations of the Russian Federation in 2018, people

The name of indicators	Bachelor's degree			Specialist degree			Master's degree		
	Accepted	*Number of students*	*Graduated*	*Accepted*	*Number of students*	*Graduated*	*Accepted*	*Number of students*	*Graduated*
1	2	3	4	5	6	7	8	9	10
Students with SEN	2456	7928	1207	650	2442	262	186	673	223
oF which: physically challenged	1365	5383	939	251	1488	163	146	513	186
Of which: children with SEN	1030	2229	174	380	865	38	29	86	29
Physically challenged (besides those of line 02)	1874	8274	1515	508	2574	318	215	916	383
Children with SEN (besides those of line 03)	1339	1581	68	628	824	29	8	40	11
Those (from pl. 01), study according to adapted educational programs: students with SEN	288	1002	148	13	58	7	16	71	34
Those (from pl. 02), study according to adapted educational programs: of which: physically challenged	180	846	116	9	49	7	14	62	30

Those (from pl. 03), study according to adapted educational programs: of which: children with SEN	104	140	5	4	8	0	1	1	0
Those (from pl. 04), study according to adapted educational programs: physically challenged (besides those of line 07)	182	729	120	41	200	33	27	86	43
Those (from pl. 05), study according to adapted educational programs: children with SEN (besides those of line 08)	67	65	0	12	8	0	0	0	0

Source: Created by the authors using information from the Federal State Statistics Service of the Russian Federation

Generally, the number of students of all levels in universities has decreased over the past years in Russia.

The total number of students of all levels in universities over the past two years has decreased from 4245, 9 thousand people to 4161.7 thousand, or 41%. Meanwhile, the rate of reduction in the number of students studying with part-time evening, and part-time extension-correspondence programs is lower compared to traditional full-time. There has even been an increase in the number of students studying with a blended part-time form of study in recent years.

Therefore, a blended learning environment is one of the important directions for the effective development of higher education in Russia and its adaptation to public willing to observe rights and provide equitable access to education for everyone without restrictions. Thus, it is important to analyze the experience of other countries in the use of blended learning at the university level.

The country of mast interest is China, as the most dynamically developing country in the world over the past few decades, where significant attention is paid to education.

Higher education in China has its own specifics, combining traditional system with the best global approaches to teaching students. Particularly, Web-based Undergraduate, which includes a blended environment of the Internet system for distance learning online. Nearly 8.2 million students were enrolled in it in China (Table 4).

Table 4. The number of students in China's formal education by type and level (higher and inclusive education), thousand people

Item	2017		2018	
	Entrants (applicants)	*Enrolment (enrolled or studying in all courses)*	*Entrants (applicants)*	*Enrolment (enrolled or studying in all courses)*
Higher Education				
Postgraduates	806,1	2639,5	857,9	2731,2
Doctor's Degree	83,9	362	95,5	389,5
Master's Degree	722,2	2277,5	762,4	2341,7
Undergraduate in Regular HEIs	7614,9	27535,8	7909,9	28310,3
Normal courses	4107,5	16486,3	4221,6	16973,3
Short-cycle courses	3507,4	11049,5	3688,3	11337
Undergraduate in Adult HEIs	2175,3	5441,4	2733,1	5909,8
Normal courses	1023,9	2589,8	1400,4	2971,1
Short-cycle courses	1151,3	2851,6	1332,7	2938,7
Web-based Under-graduate	2861,1	7359,2	3209	8256,5
Normal courses	993,2	2587,3	1044,3	2825,7
Short-cycle courses	1867,9	4771,9	2164,7	5430,8
Inclusion Education				
Correctional Work-Study schools	3,2	6	3,2	6,8
Special Education schools	110,8	578,8	123,5	665,9

Source: Created by the authors based on [33,34]

Generally, according to the Global Learner Survey 2019, people go beyond the perception of traditional learning in many countries of the world. The respondents from the US, UK, Australia, Canada, and India noted a growing duality to traditional perception of education. Meanwhile, in China, Brazil, South Africa, Spanish-American countries, the Middle East and Europe (except Great Britain), higher education is still of great importance.

The majority of respondents believe that traditional educational institutions are not able to provide working adults with the skills necessary for their future professional life. They also want governments to do more so such education is accessible to all.

In the USA, South Africa, Brazil, and Spanish-American countries, people feel that their internal educational institutions are not working out the task that the generation is performing now at work (Fig. 2).
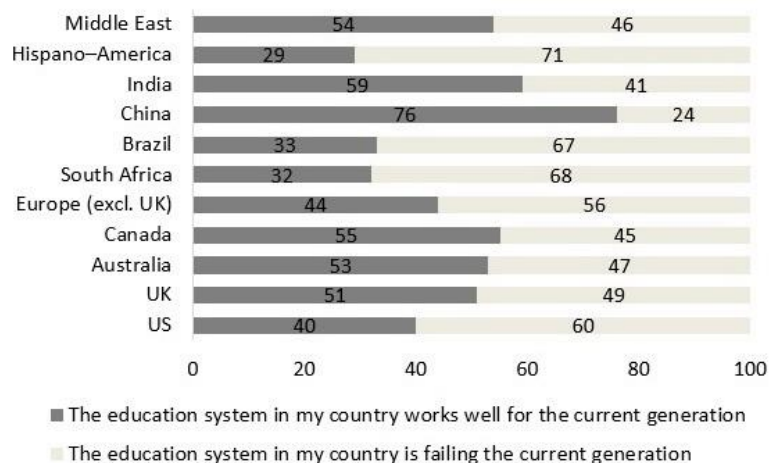
Fig. 2. Answer to the question: Which of the following statements best reflects your opinion on the education system in your country, including primary, secondary and higher education? (%).

Reference: Created by the authors based on The Global Learner Survey 2019

Having free access to online education, free online resources, short courses and trainings, in contrast to the decline in confidence in traditional educational institutions, the majority of respondents are confident that independent learning is the future. People expect digital and virtual learning to become the new norm in the next decade. Digital technologies can significantly improve the quality of education and its accessibility.

Interestingly, respondents from China prefer virtual learning or digital textbooks least, but they are very open to learning using smart devices (Table 5).

Table 5. Respondents' considerations about the future of schools and education, how likely do you think each of the following is? (Showing % Likely)

	US	UK	Australia	Canada	Europe (excl. UK)	South Africa	Brazil	China	India	Hispano-America	Middle East
Smart devices or apps (Amazon Echo, Google Home etc.) will be used to help learners at home or in the class-room.	80	76	83	79	75	92	83	89	77	86	78
More primary	74	56	67	64	57	71	73	59	76	77	66

and secondary students will attend school virtually (online) versus attending a traditional school within ten years.										
More college and university students will attend school virtually (online) vs. attending a traditional school within ten years.	81	68	81	78	71	83	79	67	79	84	71
Print textbooks will be obsolete by 2025.	70	59	73	67	67	77	71	52	74	79	68
Learning will become more self-service the older you get	84	81	85	83	74	88	75	82	79	82	77
YouTube will become a primary learning tool.	59	54	62	57	53	77	76	68	77	77	70

Source: Created by the authors based on The Global Learner Survey 2019

Another important aspect this survey shows is the digital divide and how different countries assess the impact of social networks on the learning process. The United States, Great Britain, Australia, Canada and Europe consider social networks helpful for learning less, despite the fact that they believe in their ability to create global connections.

Thus, it is worth emphasizing that the study results can be used in real life to improve teaching and, in the future, teaching students using a blended learning environment, including in an inclusive model. This model can be used to change the opinion how effectively support teachers involved in blended learning.

4   Discussion

The education system in China is currently in transition. It is trying, through the introduction of new technologies and through the search for new ways to realize access to education for all, to solve a number of problems related to the expansion of the population and the satisfaction of its needs. Meanwhile due to budget deficit, lack of material and technical base, the advantages of face-to-face interaction, it cannot fully exit without the traditional ways of transferring knowledge [7]. Blended learning is not a new term, and the concept of combining experience and learning environment prevails both abroad and domestically [26].

The rapid evolution of information and communication technologies (ICTs) has strongly influenced education systems as well as other fields around the worldwide [35]. Gradually, the amount of independent work of students is increasing. Blended learning brings with it and reduces the classroom activities by using systemic substitution with interaction in the electronic environment [2].

There is still healthy skepticism among e-learning teachers and experts. The potential benefits of this type of training for each subject or discipline are being called into question. Although blended learning already has a long history, academia is gradually recognizing significant value. It is noted that the trend of the future will be more effective use of the concept of blended learning [36].

Blended learning provides more flexible education for students and advances students' learning experience, which, in turn, increases student performance [15]. E-learning, which should be integrated in addition to full-time learning in a blended learning environment, has been seen as an effective alternative to full-time learning or self-directed e-learning [37].

The e-learning has created tremendous opportunities, and it has helped revolutionize the development of education and a change in the learning environment, which now has resulted in blended learning [38]. Interaction between online students is obviously necessary both for a higher quality of the learning process, and for the development of social integration and the formation of social capital [39].

One of the answers to the shortcomings of traditional approaches to learning is the concept of blended learning, designed to eliminate the failures of e-education using combinations of strategies and teaching models [40]. Blended learning, generally, has many advantages over the traditional way of teaching and transferring knowledge (full-time study); effectiveness in terms of the cost of training is one of the greatest benefits for both the accrediting institution and students [41].

Since the mid-1990s, South Korea has included students with disabilities into the national education agenda. After these changes, the Korean academic staff and management prepared and revised educational policies in this area more than once. The goal was to firmly guarantee the educational rights of people with disabilities within the framework of special inclusive education [42].

Among the countries of Europe, Spain is one of the most inclusive. Spain's legislation to protect the rights of people with disabilities is considered one of the most progressive. It guarantees the full degree of inclusion of people with SEN in the education of regular schools and classes [43].

The study shows the attitude of university teachers to those students who have limitations and their relationship to the implementation of inclusion at the university level, in three aspects: emotional, cognitive, and conative (Table 6). Lastly, it should be noted that the study respondents maintained a positive moral, emotional and cognitive attitude towards the rights of students with disabilities to receive higher education, but not inclusive at regular universities [17].

Table 6. The level of teachers' inclusive pedagogical practice (according to teachers)

			SUM		
	Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*	*Frequency*
Valid	-6.00	3	3.4	3.4	3.4
	-5.00	1	1.1	1.1	4.6
	-4.00	4	4.5	4.6	9.2
	-3.00	4	4.5	4.6	13.8
	-2.00	10	11.4	11.5	25.3
	-1.00	8	9.1	9.2	34.5
	.00	8	9.1	9.2	43.7
	1.00	9	10.2	10.3	54.0
	2.00	9	10.2	10.3	64.4
	3.00	7	8.0	8.0	72.4
	4.00	7	8.0	8.0	80.5
	5.00	3	3.4	3.4	83.9
	6.00	8	9.1	9.2	93.1
	7.00	3	3.4	3.4	96.6
	10.00	3	3.4	3.4	100.0
	Total	87	98.9	100.0	
Missing	System	1	1.1		
Total		88	100.0		

Source: Created by the authors based on [17]

Developing a learning environment that provides opportunities to improve progress for everyone, new qualified teachers should receive the necessary practice to work on an inclusive basis.

The versatility and complexity with the minimization of streaming and tracking activities has become the main features of the Swedish education system. Redistribution policies based on high tax rates and government spending appear to still have strong social consensus. At the same time, Sweden has undergone significant changes over the past two decades. These changes are within the neoliberal philosophy, emphasizing decentralization, marketing (guided by the principles of cost containment and efficiency), competition, standardization, individual choice and rights, the development of new profiles within specific school units and other factors that potentially work against values such as diversity, justice, and inclusiveness [18].

5 Conclusion

The analysis of the current state of higher education in Russia and China, as well as the development of a blended learning environment, shows the positive effect as that it allows students with limited educational opportunities to integrate into the educational and public life of the university and implement all types of rehabilitation along with the educational process. Meanwhile negative aspects are: the relatively high costs of medical and rehabilitation support, the need for special equipment, the lack of full inclusion in public life and the educational process of a higher educational institution and, as a result, poor adaptation to life outside the educational institution, which subsequently may not allow full disclosure and fulfil the professional qualities of a graduates with disabilities. At the same time, a blended learning environment is more effective than the traditional model for inclusive education.

Quality development of the educational process requires special attention. The main practical aspects of teaching and developing programs for students of blended inclusive education should be taken into account. Particularly, Web-based Undergraduate, which includes a blended environment of the Internet system for distance learning online. Nearly 8.2 million students were enrolled in it in China. The results of the studies demonstrate that the organization of inclusive education requires a change in approaches. The focus of inclusive learning should be on the student, and not on the practical or technical aspects exclusively. The international practice of the development of blended learning within the framework of inclusive education can be integrated with the studied approaches. That is one of the relevant points for further study.

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