

Subjects Adaptation Techniques for Primary School Pupils with Special Educational Needs

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Abstract

The research on the adaptation of children with disabilities in general education institutions is topical, as the education of children with special educational needs provides helps them to acquire a profession and become self-sufficient. The aim of this work was to develop subjects adaptation techniques for primary school pupils with special educational needs. The teachers' attitudes to inclusive education were determined through the Attitudes Towards Inclusion Scale (AIS Scale). The Teacher Efficacy for Inclusive Practices (TEIP) Scale was used to establish the teachers' effectiveness in implementing inclusive practices. The Concerns about Inclusive Education Scale (CIES) was used to study concerns about inclusive education, while the intention to teach in an inclusive classroom was identified through the Intention to Teach in Inclusive Classroom Scale (ITICS). The impact of general education alongside ordinary children on children with special educational needs was determined through Stott's Observation Charts. The techniques proposed in this study involve the use of different methods, tools, technologies by teachers that are required for the adaptation and correction of subjects. It is necessary to take into account the individual capabilities of pupils with special educational needs, as well as to meet the educational needs of ordinary pupils. It is worth to further work on finding new methods and techniques for adapting curricula to the inclusive educational environment based on new advances in pedagogy and innovative technologies.

Keywords: limited opportunities, special educational needs, teacher efficiency, teaching assistant, didactic materials, educational achievements

1. Introduction

The Salamanca Declaration set the task for politicians, teachers, parents to adapt existing education systems to the inclusive education requirements by active cooperation. It is necessary to revise the policies and make educational institutions available to include all those who want to get an education (people with disabilities — hearing and visual impairments and other physical disabilities, mental illness, homelessness, workers, people representing other cultural, linguistic minorities) in the educational process. They must be provided with specially equipped premises, necessary specialists, didactic materials, adapted curricula. Besides, it is important to adjust the subjects in such a way that pupils with different capabilities can assimilate and cope with them. Mainly teachers were entrusted to solve this problem. All learners must obtain knowledge, acquire skills and abilities necessary for their future employment based

on the experience of parents of pupils with disabilities, as well as in cooperation with specialists (physicians, psychologists, speech therapists, speech pathologists). The task is difficult because there are different pupils who have different capabilities in one class. According to the provision on inclusive education, pupils who have differences in physical, emotional, mental, development, high intelligence, with different disabilities and talents should study in one class. The teacher needs to meet everyone's learning needs, taking into account pupils' individual abilities and contributing to the maximum possible extent for these children to succeed. Despite the fact that the creation of inclusive education has been declared for over 25 years, a number of issues still remain unresolved. They include the finding the ways to convince parents, teachers about the reasonability and appropriateness of inclusive education, as well as the ways to create an effective inclusive learning environment, adapt subjects to the individual capabilities of pupils.

The aim of this work was to develop subjects adaptation techniques for primary school pupils with special educational needs.

The aim involved the following research objectives:

- 1) Develop subjects adaptation techniques for primary school pupils with special educational needs;
- 2) Study teachers' attitudes to inclusive education, their readiness, intentions and concerns.
- 3) Assess the effectiveness of subjects adaptation techniques by monitoring pupils and evaluating the performance of pupils with special needs and their classmates.

2. Literature Review

Efendi (2018) states that the number of children with various disabilities is still growing despite the rapid development of science and technology, which contributes to timely diagnosing of pathologies in the early stages and taking measures to reduce or avoid them. According to the WHO, more than 15% of the world's population has a disability, more than 10% of them are children (<https://www.who.int/>). Every child has the right to a decent education, which children with disabilities could receive in specialized institutions only until recently. Kryshtanovych et al. (2020) states that inclusive education provides that children with special educational needs (SEN) study in general education institutions alongside ordinary pupils Crul et al. (2019) emphasizes that inclusion applies not only to children with disabilities, but also to refugee children, who also need to adapt and socialize in their new environment. This promotes the growth of the potential of such children. Hayes and Bulat (2020), Magnússon (2019) maintain that not only pupils with disabilities benefit in such a case, but also the country's economy.

In inclusive education, teachers are responsible not only for learning outcomes, but also for the perception of pupils with disabilities by their classmates. Garzyn Dżaz and Goodley (2021) writes that one way to build empathy and a deeper awareness of disability is to learn about the content of fairy tales which contain an implicit analysis of disability. Such texts help pupils to understand the concept of disability as an element of human diversity (similar to gender, class, race, age, etc.). This method is often used in the training of students (physicians, teachers, educational psychologists).

To teach children with different abilities, the teacher must understand the specifics of teaching (Mfuthwana & Dreyer, 2018), have a positive attitude towards inclusive learning (Saloviita, 2020) and a number of competencies (Sulasmi & Akrim, 2019, Majoko, 2019): identifying pupil's peculiarities (Karlsudd, 2020; Majoko, 2019); and a number of competencies (Sulasmi & Akrim, 2019, Majoko, 2019): identification of student characteristics (Karlsudd, 2020; Majoko, 2019); adaptation of the curriculum to fit the capabilities of pupils; creating a friendly environment in the classroom with different children; use of special adaptive learning technologies (speak local sign language, Braille); conducting assessment in the inclusive educational environment; introduction of a differential approach (Majoko, 2019), etc. Pappas et al. (2018), Walton (2018) state that it is necessary to introduce relevant subjects into the curricula of pedagogical education institutions in order to develop these competencies in future teachers. Efendi (2018), Karlsudd (2020) add that practicing teachers may develop such competencies through advanced training and postgraduate education. Greater effect can be achieved when such courses are delivered by teachers with disabilities, based on their own experience of disability.

Nilholm (2021) notes that attention in inclusive education should be paid to whether pupils with special needs are evenly distributed across schools and classrooms. Paulsrud and Nilholm (2020) indicate that in many countries, not only teachers but also assistants are involved in inclusive education in order to provide continuous support to pupils with special needs. According to Paulsrud and Nilholm (2020), the form of interaction of the latter affects the

effectiveness of the inclusion of children with special needs in education in general education institutions. Researchers distinguish several forms: the teacher teaches all pupils in the class, and the assistant monitors pupils and helps them complete assignments, if necessary. The teaching load is equally divided between two teachers: one form is when the class is divided into two parts and one teacher explains the material in one part, while another teacher does in the other, but delivers the same content in a different way (Lupak et al., 2020). Another form is when one teacher works with the whole class, and the second teacher works additionally with the part of the class that needs it (Dichek et al., 2021). A form of learning can also be used where both teachers share responsibilities and responsibilities for learning outcomes equally and work in a team. All forms of learning require effective interaction between teacher and assistant (Akimova et al., 2022). It is important that the teacher shares the experience of teaching the subject with the assistant, and the speech pathologist explains the peculiarities of a pupil, and all together find alternative learning approaches to the transfer of knowledge to the pupil and to the development of his or her necessary skills (Abysova et al., 2020). This can be realized on a permanent basis in the form of cooperative learning, and recurrently — by providing special advice (Shamne et al., 2019). Karpushkina et al. (2021) notes that psychological and pedagogical support is also needed to reduce the psychological discomfort of students with SEN. It is necessary to emphasize the importance of schooling to pupils (Nilholm, 2021), adapt subjects to the individual peculiarities (Schuelka, 2018), additionally support in the classroom and help with homework, use different forms of work in class, pay attention to pupils' and parents' opinions, while the teacher must remain a reputable (Nilholm, 2021). Karlsudd (2020) emphasize that the positive role of out-of-school institutions in student development, including SENs, should not be overlooked.

Paulsrud and Nilholm (2020) state that inclusive learning makes it impossible to use standard curricula and approaches to learning. Therefore, Pappas et al. (2018) indicates that they should be adjusted and adapted to the requirements of inclusive education to ensure that all pupils can achieve educational goals. In such a case, an assessment system, which is based on assessing the individual progress of pupils, should be used. At the same time, we should not forget about the growing importance of various international audit tests, such as the Programme for International Student Assessment (PISA) or International Mathematics and Science Study (TIMSS). Hayes and Bulat (2020) maintains that in general, adaptation does not mean reducing the volume of knowledge that pupils should acquire as a result of learning, but finding such tools, convenient ways, forms and methods of presenting this knowledge and assessing their level that will take into account the individual capabilities of each pupil with SEN.

According to Pappas et al. (2018), teachers note the lack of educational material that can be used in the context of inclusive education of pupils with SEN according to their specific individual capabilities. In order to meet the needs for special teaching materials, Mngo & Mngo (2018) proposes to partner with foreign teacher training schools. This can facilitate the exchange of experience, as well as didactic materials: special textbooks, special workbooks, special texts, Braille texts, videos, etc. Teachers should use didactic materials where people with disabilities are represented in a way that promotes empathy and solidarity (Hayes & Bulat, 2020; Karlsudd, 2020) and breaks down negative stereotypes. It is recommended to keep the 15% proportion of the material containing information about people with disabilities in relation to all material.

The teachers use the following methods, practices and approaches in inclusive education: constructivist approach (Mpho, 2018), universal design for teaching and differentiated instruction (Schwab et al., 2019), use of ICT (Rasmitadila et al., 2020), case study method (Bystrova et al., 2021). It was also studied what results can be achieved during inclusive education in different subjects. For example, Physical Education (Penney et al., 2018), German, English, Mathematics (Schwab et al., 2019).

3. Methods

This study was conducted in three stages.

The first stage involved the study of foreign experience in the implementation of inclusive education in primary school in order to create techniques for adapting subjects for primary school pupils with special educational needs. The results of research obtained in schools in Finland, Sweden, the USA, Great Britain and Germany were considered as an example. Following the recommendations of the Standard Programme of Advanced Training of Teachers to Work in an Inclusive Environment in General Secondary Education Institutions in accordance with the requirements of the New Ukrainian School Concept (Ministry of Education of Ukraine (MESU, 2019)), employees of the Department of Psychological and Pedagogical Support of Children with Special Needs of the Mykola Yarmachenko Institute of Special Pedagogy and Psychology of the National Academy of Pedagogical Sciences of Ukraine, the Department of Education of Visually Impaired Children of the Mykola Yarmachenko Institute of Special

Pedagogy and Psychology of the National Academy of Pedagogical Sciences of Ukraine, and Associate Professor of the Department of Speech Therapy and Speech Psychology of the Faculty of Special and Inclusive Education of National Pedagogical Dragomanov University developed the subjects adaptation techniques for primary school pupils with special educational needs.

The second stage involved the assessment of teachers' attitude and readiness for teaching in an inclusive environment. The developed techniques have also been experimentally implemented. This was followed by the observation of the educational process, organized by the teachers of the experimental group with the use of the proposed techniques.

The third stage involved the evaluation of the results of the implementation of subjects adaptation techniques for primary school pupils with special educational needs.

The sample included 40 teachers who worked in primary school in an inclusive environment. One of the selection criteria was teaching experience in the classroom, which included children with special educational needs for at least one year. The teachers had different pedagogical experience (from 3 to 30 years), as well as different teaching experience in an inclusive environment (from 1 to 10 years).

Besides, sample teachers worked in schools located in rural and urban areas. There were 20 teachers and 20 teaching assistants, of which 5 teachers and 5 assistants were the control group, 15 teachers and 15 teaching assistants were the experimental group. Teachers and teaching assistants worked in classes that included students with SEN and had visual, hearing, movement impairments, Down syndrome, delayed reaction, hyperactivity. The sample also included 368 pupils (92 — control group, and 276 — experimental group).

The study used well-known methods of analysis and synthesis, as well as methods for determining teachers' attitudes to inclusive education, their intentions, concerns and effectiveness on scales: the Teacher Efficacy for Inclusive Practices (TEIP) Scale, the Attitudes Towards Inclusion Scale (AIS Scale), the Intention to Teach in Inclusive Classroom Scale (ITICS), the Concerns about Inclusive Education Scale (CIES) (Miesera et al., 2018). Pupils' performance was also assessed before and after the experiment through the analysis of the results of the final control of the pupils' performance, Stott's Observation Charts (Muzyka et al., 2000).

Table 1. Research Methods

Object of the research	Method	Evaluation scale
Attitudes towards inclusion	AIS	Likert scale:
Teacher efficacy for inclusive practices	TEIP	1 - completely disagree; 2 - moderately disagree, 3 - slightly disagree, 4 - undetermined, 5 - slightly agree, 6 - moderately agree; 7 - I completely agree
Concerns about inclusive education	CIES	
Intention to teach in inclusive classroom	ITICS	
The level of performance of all pupils in the class	Inspection test	12-point scale: 1-3 – elementary; 4-6 – medium; 7 – 9 – sufficient; 10 – 12 - high
Level of adaptation of children with SEN	Stott's Observation Charts	Manifestation levels: – 0-20 % – weak – 21-40 % – noticeable – 41-60 % – strong – 61-80 % – very strong – 81-100% – excessive

The Stott's Observation Charts were filled in by a teaching assistant and processed by psychologists. The experiment lasted for one school year. Mathematical data processing methods and Statistica software were used.

4. Results

In order to adapt the learning environment to the pupils' special needs, teachers need to:

- 1) Have an idea of inclusive education;
- 2) Have a positive attitude to inclusive education;
- 3) Be able to instil a positive attitude of ordinary pupils to pupils with SEN;
- 4) Learn to identify pupils with disabilities;
- 5) Know and be able to apply technologies that can help create appropriate conditions for teaching students with SEN;
- 6) Know and be able to apply different methods, technologies, knowledge, skills and abilities, and be able to adapt curricula to individual needs of pupils, without reducing the requirements for learning outcomes, thus contributing to the academic success of both pupils with SEN and ordinary pupils in the classroom;
- 7) Be able to assess the performance of pupils with SEN.

In view of the above competencies, the developed subjects adaptation techniques for primary school pupils with special educational needs were based on the following key provisions.

1. A teacher must teach in inclusive educational environment with the teaching assistant's support. Therefore, it is necessary to train teachers and assistants together. In this way, assistants acquire new skills related to teaching literacy, mathematics and other subjects offered to general education teachers, and general education teachers gain knowledge on the problems of teaching pupils with SEN. Besides, they should be introduced to the effective division of responsibilities between teacher and assistant. The assistant assists the teacher in preparing and conducting the lesson (adapts the didactic materials that the teacher plans to use in this lesson to the needs of pupils with SEN, is present during the lesson and assists the teacher in conducting it, while supporting the whole class, not just pupils with disabilities, in order not to increase the social isolation of pupils with SEN and not to reduce the interaction of pupils with teachers and classmates).

2. Introducing teachers into additional tools and methods that should be used during classes in inclusive education. For example, visually impaired pupils need to be taught to use Braille at the time when all pupils in classroom study the alphabet. In this case, the assistant must prepare didactic materials using a Braille converter, identical to those that the teacher use during the lesson for all pupils. Local sign language should be used for the interaction of pupils with hearing impairments. Moreover, schooling should begin with the study of the Ukrainian dactyl alphabet, simultaneously with ordinary pupils. The teachers are not provided during their training with ready-made didactic materials designed for working with children with SEN. It is intended to teach teachers to prepare them based on the specific individual needs of a particular pupil with SEN. The necessary recommendations are provided for this purpose.

3. Teachers must be able to plan the learning process, evaluate pupils as a whole class and pupils with SEN, taking into account the individual peculiarities of each pupil in the class. To do this, the teacher must learn to choose a convenient pace for presenting all the material, the completion of assignments taking into account the assistant's help. Oral or written instructions should be given depending on the special needs of pupils. It is not necessary to compensate for the low rate of information perception by some students by reducing its volume and reducing the requirements for learning outcomes. Evaluation should be flexible in terms of forms, not criteria. Pupils can demonstrate the acquired knowledge in different ways: orally, in writing, by presentation. It is appropriate to revise the form of presenting information, and supplement the lessons, if necessary, by individual work with pupils that have SEN. It is also necessary to work individually with invited specialists (speech therapists, speech pathologists and other specialists) at regular intervals.

4. It is necessary to consult with speech pathologists, speech therapists, as well as with teachers who have disabilities themselves. Besides, the constant online support of teachers by specialists on issues that arise in daily work in inclusive educational environment is desirable.

5. Teachers and their assistants must learn to apply already known teaching methods in the context of inclusive education. For example, case studies, role-plays, collaborative learning, practical classes and excursions, individual, pair and group work; mutual learning, etc. There are also a number of special methods that can be used in the learning process for children with certain disabilities. For example, didactic games with visually impaired children, neurogames, articulation exercises for children with speech impairments, Numicon techniques for children with

Down syndrome, special gymnastics (articulation, correction, development, etc.), kinesiological fairy tales, etc. Teachers should also learn ICTs adapted to special needs, in particular the Braille keyboard. It is also advisable to use different types of didactic materials, which can be used to present the same information at different stages (learning new material, consolidation of the studied material, development of practical skills, generalization and systematization, evaluation of knowledge) in different ways. For example, textbooks should be used, but it is obligatory to include illustrations of people with special needs, online resources, manipulators, etc.

6. Educational work of psychologists is important in preparing teachers and assistants to work in an inclusive educational environment. It is important to develop the right attitude of teachers and students to pupils with SEN when working with them. Pupils with SEN should not be called “disabled/invalids”, it is better to use “people with disabilities”. Teachers should promote the development of empathy in ordinary students for classmates with SEN, as well as develop attitudes not as unusual, anomalous, but as different and diverse (as different in gender, religion, culture). It is appropriate to emphasize the success of people with disabilities, demonstrate their strengths and admiring the cases of manifestation of their abilities, as well as to give examples of famous successful people with disabilities.

The attitude and readiness, intentions and concerns of teachers and assistants regarding inclusive education were assessed in the course of teaching through the use of subjects adaptation techniques for pupils with special educational needs developed in this paper. Figures 1 – 4 present the assessment results.

As Figure 1 shows, the application of the techniques developed in this paper by teachers and assistants contributes to their better attitude to inclusive education. Teachers support the right of students with SEN to study with other pupils in general education institutions. Teachers agree that the inclusion of pupils with SEN in the class does not worsen social relations between classmates and has a positive effect on their learning outcomes. Teachers have become more aware of the need to adapt subjects to inclusive learning. This programme contributed to increasing teachers’ professional competencies needed to teach pupils with both higher and lower abilities compared to the medium level.

Based on Figure 2, it can be concluded that more teachers have become aware of the need to cooperate with colleagues, parents in an inclusive educational environment after applying the techniques proposed in this paper. Teachers also confirmed the need to adapt the curriculum and the need for lifelong learning in order to improve professional competence in the field of inclusive education.

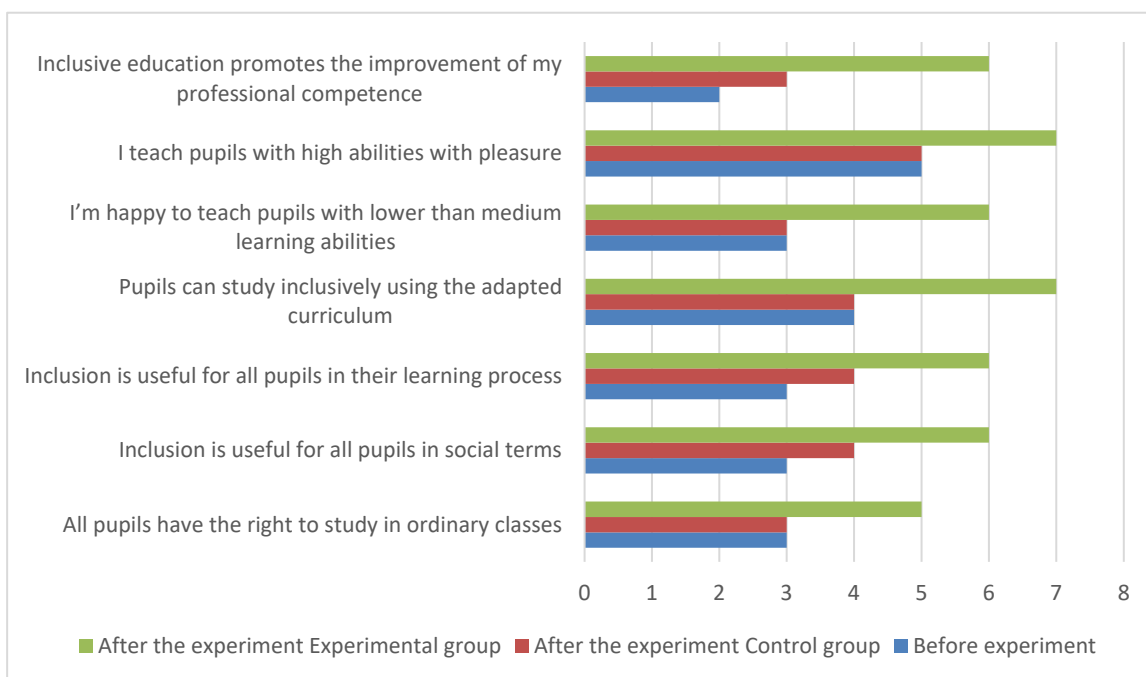


Figure 1. The Results of the Evaluation of Teachers’ Attitudes to Inclusive Education on the AIS Scale

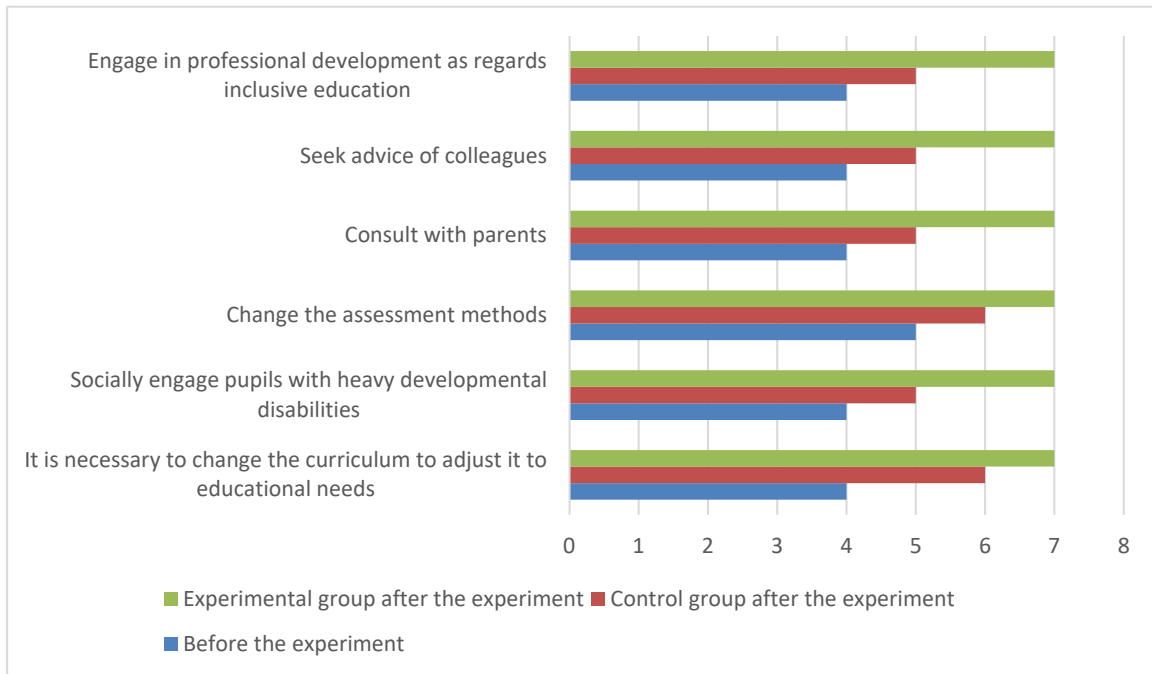


Figure 2. Results of Assessment of Teachers’ Intentions to Teach in an Inclusive Classroom on the ITICS Scale

As Figure 3 shows, the use of subjects adaptation techniques for primary school pupils with special educational needs has led to a decreased pupils’ anxiety, worry, stress associated with the lack of necessary knowledge and skills. It also helped increase productivity, thereby compensating for the lack of time.

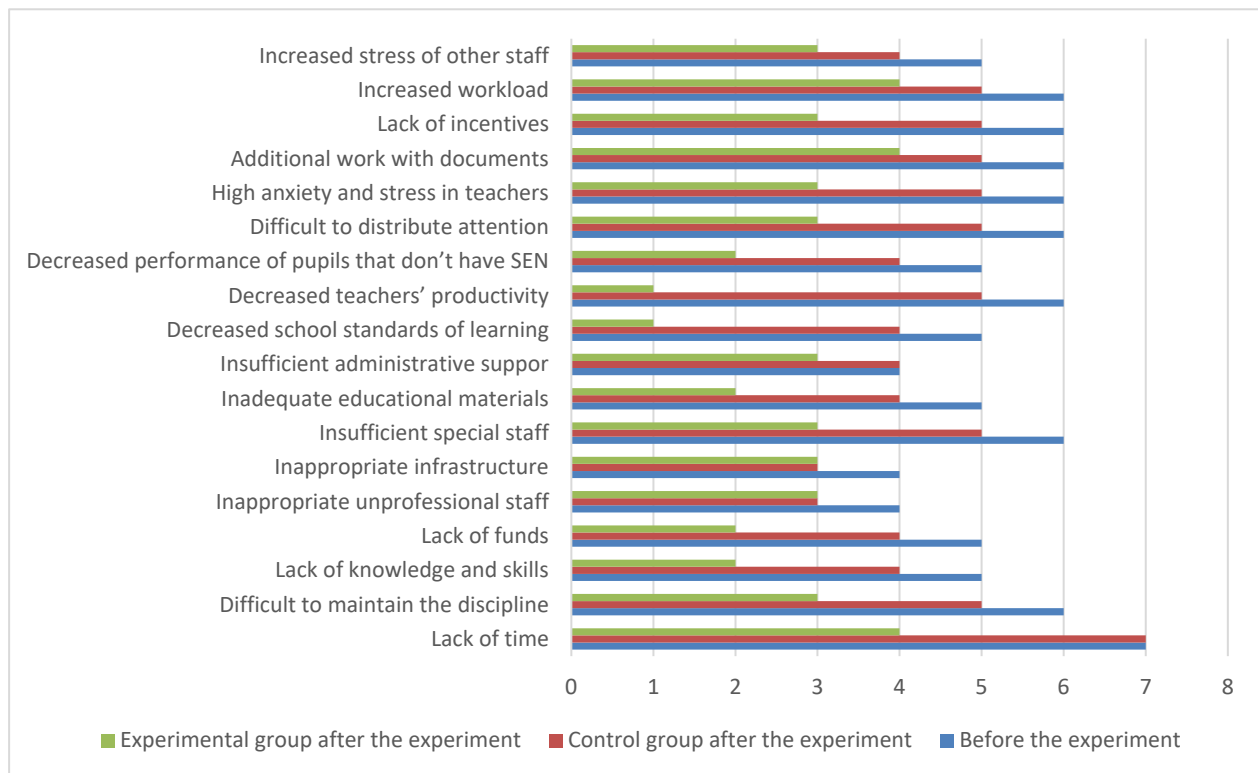


Figure 3. Results of the Assessment of Teachers’ Concerns about Inclusive Education on the CIES Scale

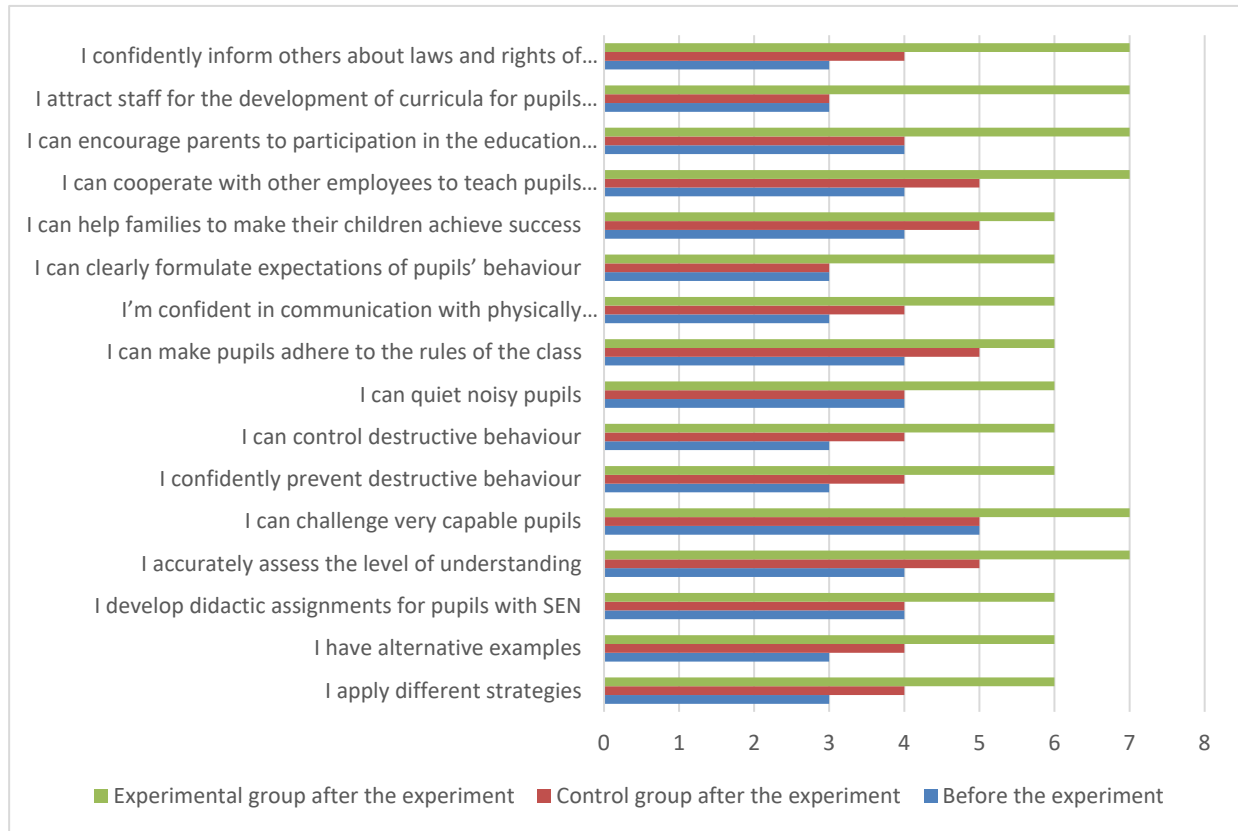


Figure 4. Results of Teacher Performance Evaluation for the Implementation of Inclusive Practices on the TEIP Scale

Introducing teachers and their assistants with the subjects adaptation techniques for primary school pupils with special educational needs gave them knowledge of alternative examples, ability to develop didactic materials for pupils with SEN, ability to work with a differentiated audience. Teachers note an increased confidence in their ability to teach in inclusive educational environment and provide advice to colleagues.

As Figures 1-4 demonstrate, the attitude of all sample teachers to inclusive education, teachers' intentions to teach in inclusive classes, teachers' concerns about inclusive education, and teachers' effectiveness in implementing inclusive practices changed during the experiment. The largest changes were found in the experimental group.

This study showed (Table 2) that the inclusion of children with SEN in the regular classes of general education institutions, for example in primary school, did not have a negative impact on the learning outcomes of ordinary pupils. But, in turn, this had a positive impact on the performance of pupils with SEN. Moreover, pupils with SEN in the experimental group were able to achieve a sufficient level of performance due to properly adapted subjects.

Table 2. Results of Assessment of Pupils' Performance

Average score											
Control group						Experimental group					
Pupils with SEN		Ordinary pupils				Pupils with SEN		Ordinary pupils			
Before the experiment	After the experiment	Before the experiment	After the experiment	Before the experiment	After the experiment	Before the experiment	After the experiment	Before the experiment	After the experiment	Before the experiment	After the experiment
5.3	5.9	7.5	8.3	5.3	7.1	7.5	8.7				
medium	medium	sufficient	sufficient	medium	sufficient	sufficient	sufficient				

The observations of pupils with SEN (Table 2) found the impact of developed subjects adaptation techniques on the level of adaptation of pupils in the learning environment created in general education institutions.

Table 3. Results of Observations of Pupils with SEN using Stott's Observation Charts

Symptom complex of school maladaptation in percent	Mean value/manifestation level							
	Control group				Experimental group			
	Before the experiment	the	After the experiment	Before the experiment	the	After the experiment	the	
distrust of new people, things, situations	67 %		59 %	67 %		39 %		
	very strong		strong	very strong		noticeable		
deepening in oneself	73 %		65 %	73 %		46 %		
	very strong		very strong	very strong		strong		
anxiety towards adults	62 %		54 %	62 %		35 %		
	very strong		strong	very strong		noticeable		
hostility towards adults	49 %		38 %	49 %		22 %		
	strong		noticeable	strong		noticeable		
anxiety towards children	79 %		66 %	79 %		37 %		
	very strong		very strong	very strong		noticeable		
lack of social norms (asociality)	65 %		53 %	65 %		39 %		
	very strong		strong	very strong		noticeable		
restlessness	56 %		47 %	56 %		31 %		
	strong		strong	strong		noticeable		
hostility towards children	44 %		35 %	44 %		26 %		
	strong		noticeable	strong		noticeable		
emotional tension	63 %		58 %	63 %		42 %		
	very strong		strong	very strong		strong		
neurotic symptoms	38 %		31 %	38 %		23 %		
	noticeable		noticeable	noticeable		noticeable		
adverse environmental conditions	75 %		69 %	75 %		46 %		
	very strong		very strong	very strong		strong		
mental retardation	49 %		42 %	49 %		33 %		
	strong		strong	strong		noticeable		
diseases and organic disorders	46 %		39 %	46 %		37 %		
	strong		noticeable	strong		noticeable		
physical defects	49 %		45 %	49 %		42 %		
	strong		strong	strong		strong		

Sexual development and depression were not detected at any stage of the experiment in any of the pupils with SEN included in the sample, so they were not included in the table of results. The techniques developed and implemented in the course of this study helped to significantly reduce the severity of distrust of the new in pupils with SEN. They also helped reduce anxiety and hostility towards adults and children.

As Table 3 shows, coordinated work of the teacher and the assistant on the organization of the educational process in classes that include children with SEN has a positive impact on their adaptation, and as a consequence, on their performance (Table 2).

We found through the mathematical methods of data processing that the intergroup variance d , which was determined by the heterogeneity of the sample and associated with conducting a pedagogical experiment in different groups, which included pupils and teachers from different general education institutions with different resources, ranged from 284 to 1,425. In turn, the standard deviation from the mean value for the same parameter in different educational institutions of the sample was different. In this case, the intergroup variance, which describes the fluctuations of these groups, and intragroup, which describes the fluctuations due to random factors not taken into account, were not equal, which indicates the invalidity of the null hypothesis.

Using Pearson's chi-squared test to the results of the study, we found that the values of χ^2 obtained for all

experimental groups are greater than χ_{12}^2 calculated for the control groups. Therefore, we can argue that there is a correlation between the organization of the educational process and adapted subjects in all experimental groups, as well as the level of adaptation of pupils with SEN and the level of performance of all pupils.

The calculated Cohen's coefficient in the experimental groups also from 0.8 to 1.17. This indicates the high effect of using the proposed approaches to the adaptation of subjects to the learning conditions of pupils with SEN. In the control group, which studied in a traditional way, the Cohen's coefficient was 0.5, which indicates a medium effect.

5. Discussion

The research conducted in this paper indicates that the training of teachers on inclusive education in Ukraine forms their positive attitude towards the inclusion of children with special educational needs in general education institutions. And a properly organized learning of adapted subjects has a positive impact on the level of performance of both pupils with SEN and ordinary pupils.

Teachers in many countries around the world still have no definite attitude towards inclusive education. This study showed that teachers have a positive attitude towards the inclusion of pupils with special educational needs in the classes of general education institutions, while fully agreeing to work with gifted children and moderately agreeing to teach pupils with lower than medium learning abilities. However, the case of Cameroon shows that the vast majority of teachers hold the opinion that pupils with SEN should study in special schools (Mngo & Mngo, 2018). At the same time, teachers' attitudes towards inclusive education depend on their age and pedagogical experience.

Pappas et al. (2018) found in the research on teachers' attitudes towards inclusive education that teachers were more positive about the inclusion of pupils with visual, motor, hearing and speech impairments. They were, however, less benevolent to pupils with mental disabilities. Teachers' attitudes towards inclusive education also depend on the level of education. According to Mngo and Mngo (2018), teachers with a master's degree have a more positive attitude towards inclusive education, and those with a lower degree have a more negative attitude towards inclusion. It was also proved that teachers are more successful in inclusive education when they undergo specialized training in special courses. Mngo and Mngo (2018) obtained the following data: of 348 teachers who participated in the survey 51% prefer specialized schools for teaching children with SEN. More than 58% believe that they are unable to meet the educational needs of students with SEN.

Perceptions of inclusive education are influenced by various factors, including political support (Alharbi & Madhesh, 2018), as well as the attitude of school administration (Timothy & Agbenyega, 2018), teachers and parents to the inclusion of pupils with SEN in the educational process (Bergsma, 2022). A survey of parents from Germany showed that they have a positive or neutral attitude towards the inclusion of pupils with SEN in the classes in which their children study (Paseka & Schwab, 2020).

IQ tests, as well as linguistic and mathematical tests showed that the inclusion of pupils with SEN in the class does not affect the learning outcomes of ordinary pupils (Pappas et al., 2018), and even has a positive effect (Hayes & Bulat, 2020). Comparing the results of assessing pupils' performance in the control and experimental groups before and after the experiment, it was found that the average score of pupils with SEN increased significantly in the experimental group (from 5.3 to 7.1), in contrast to the control (from 5.33 to 5.9). At the same time, the average score of their classmates did not decrease (from 7.5 to 8.3 and 8.7 in the control and experimental groups, respectively).

Different countries interpret and adhere to inclusion in education differently. For example, Indonesia provides several forms of education: integrated, which involves the education of children with disabilities together using the usual school curriculum, and inclusive, which involves programmes adapted for children with disabilities (Efendi, 2018). There may be full inclusion, regular classes with clusters, regular classes with temporary involvement of children with disabilities in separate rooms to work with mentors, mixed form — regular classes with clusters and involvement, special classes with associations of children with different diagnoses, and full special classes. Sweden still faces the problem of choosing a school for children with SEN (Magnússon, 2020).

Bystrova et al. (2021) provided an example of pupils with visual impairments, whose feeling of isolation was more than 50%. This entails speech inertia, reduced cognitive activity, behavioural problems, low motivation and autonomy, etc. Researchers offer to arrange psychological and pedagogical support in the classroom in order to avoid the isolation of pupils with SEN. It leads to the socialization of pupils and increase their activity, confidence, and improve a number of learning outcomes and performance. Communicative and practical skills are developed. This study found that the level of adaptation of pupils with SEN in the learning environment increases with the adaptation

of subjects. It reduces distrust of new people, things and situations, introspection, anxiety and hostility towards adults and classmates, emotional stress.

6. Conclusion

The researchers, teachers, psychologists, speech pathologists and educators around the world have been addressing an urgent problem of creating appropriate conditions for the socialization and education of children with disabilities. This study proposes subjects adaptation techniques for primary school pupils with special educational needs. It was found that these techniques can improve the attitude of teachers and assistants towards inclusive education. They can also improve the training of teachers to properly organize the learning process in classes that include pupils with special educational needs. The use of the proposed techniques involves communication of teachers with assistants, psychologists, speech pathologists, which is required for the organization of effective learning of all pupils in the class. As a result of using subjects adaptation techniques for primary school pupils with SEN, teachers gain confidence in their own abilities and the necessary knowledge and skills to organize the educational process in an inclusive educational environment. As this study showed, introducing teachers with the techniques proposed in this study has a positive impact on the adaptation of pupils with special educational needs and the level of performance of all pupils in the class. The results of this study can be useful for teachers of pedagogical education institutions and teacher advanced training courses, as well as teachers and their assistants. Finding new methods and techniques for adapting curricula to the inclusive educational environment, which are based on the current state of science and technology, can be the vector of further research.

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