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Opinions and Suggestions about Teaching Mathematics from Teachers Who Support Pupils With Special Learning Difficulties in Primary Schools*

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Abstract

This study explores the experiences of primary school teachers providing remedial mathematics education to students with special learning difficulties (SLD). Through qualitative research and interviews with 22 teachers, findings highlight challenges such as insufficient knowledge of SLD, reliance on individual education plans, and students' difficulties in counting, operations, problem-solving, and memorization. Teachers use diverse methods like concrete materials, repetition, and games, along with tools such as worksheets and smart boards. Challenges include inadequate physical conditions, limited class time, and low student and parent engagement. Suggestions for improvement focus on better resources, teaching methods, professional development, and enhanced communication with parents and classroom teachers.

Keywords:

Inclusive Education, Special Learning Difficulties, Mathematics Learning Difficulties, Resource Room, Remedial Education

Introduction

Despite the existence of individuals with normal or even supernormal intelligence, a considerable number of them experience persistent and significant difficulties with fundamental academic skills, including reading, writing, reading comprehension, arithmetic operations, and problem solving. These skills are essential for independent living in modern society. The term 'learning disability' has gained increasing acceptance as a distinct disability group, particularly since the 1960s. This was a period during which many students were unable to benefit from the education provided in schools, leading to a shift in focus towards education based on student characteristics (Özyürek, 2003). While there are numerous definitions of specific learning disabilities (SLD), the most widely used and accepted definition is that provided in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). In accordance with this definition, a specific learning disability (SLD) is a neurodevelopmental disorder of biological origin that impedes the acquisition and utilisation of reading, writing and mathematics skills for a minimum of six months.

The prevalence of specific learning disabilities in school-age children from diverse linguistic and cultural backgrounds is estimated to be between 5% and 15% (American Psychological Association [APA], 2013). A variety of classifications of learning disabilities can be found in the literature. The widely used and accepted classification identifies three types of SLD. In accordance with this definition, SLD is classified as dyslexia (reading difficulty), dyscalculia (mathematics learning difficulty) and dysgraphia (writing difficulty) (Hopcan, 2017). The subject of this research is mathematics learning disability, which is defined as a learning disorder characterised by deficiencies in number sense, the ability to memorise arithmetic facts, the capacity to perform calculations accurately and fluently, and reasoning (APA, 2013). It is erroneous to suggest that students diagnosed with a mathematics learning disability (MLD) are incapable of learning (Kroesbergen, Huijmans, & Kleemans, 2022). Such students may be defined as those who learn in different ways and at a slower pace than their peers (Filiz, 2021; Lewis, Thompson, & Tov, 2022; Mononen, Niemivirta, & Korhonen, 2022). The prevalence rate of mathematics learning disability among school-age children has been estimated at 5-7% based on studies conducted in multiple countries (Mutlu, 2020). While there are various forms of SLD, including reading difficulties, mathematical difficulties and writing difficulties, in Turkey, all students with these difficulties are typically diagnosed with SLD. Mathematics learning disability, which is one of the types of SLD, is not diagnosed as a standalone condition. Students who have been diagnosed with SLD as a result of assessments conducted by guidance and research centres continue their education in general education classes with their peers through the provision of inclusive education.

The term "mainstreaming" is used to describe the process of providing special education services to students with special needs and their teachers, with the goal of integrating them into general education classes alongside their peers (Kargın & Sucuoğlu, 2006). In Turkey, support services for students with special needs and their teachers are provided through the DEO (support education room) practice. Furthermore, despite the absence of a formal diagnosis, one in four students identified with SLD receives special education services due to mathematical difficulties (Melekoğlu, 2022). These difficulties are frequently observed in individuals diagnosed with dyslexia (Dowker, 2004). A review of the literature revealed the existence of several studies that have been conducted in Turkey with the aim of systematically compiling and analysing research on the practices of classroom teachers in relation to RPA. These studies include those conducted by Yılmaz et al. (2021), Talas et al. (2022), Bozak & Çay (2023), Kaptan (2019), Filik (2019) and Demirhan (2023). The studies on the opinions and experiences of teachers in 2019 and subsequent years concerning PLC concentrate on the observations and experiences of classroom teachers, mathematics teachers, and pre-service teachers (Kaçar, 2018; Büyükkarcı & Akgün). The studies also encompass the experiences of parents (Doğan & Korkmaz, 2021), the identification processes of students with PLC and the development of diagnostic models (Mutlu & Akgün, 2017).

The effects of instructional interventions with students diagnosed with PLC on different learning areas of mathematics, including numbers, operations, and the number line, have been studied (Filiz, 2021; Uygun, 2019; Koç & Korkmaz, 2019; Özkubat et al., 2022; Kılınç (2023); Kumaş & Ergül (2017); Deniz (2019); Sertdemir (2023); Mutlu (2016) and Özkubat & Özmen (2018); Gencan (2020) have also contributed to this field. In DEO, studies on the mathematics teaching of teachers in support education with students diagnosed with Specific Learning Disabilities (SLD) and the impact of support education on their mathematics achievement were examined (Brownstein, 2016; Carpenter, 1985; Ünay, 2015). Moreover, the majority of the existing studies are primarily concerned with the implementation of support education practices with students diagnosed with SLD and the experiences of classroom teachers. PLC is one of the types of SLD and is a heterogeneous group. The research will be conducted with teachers who work one-to-one with these students in the support education room. This will provide detailed information about these students, who exhibit different characteristics.

The objective of this study is to ascertain the experiences of teachers who provide support education to students with special learning difficulties in primary schools with regard to mathematics teaching, and to examine in detail the positive and negative situations encountered during the teaching process.

In alignment with the aforementioned objectives, the following research questions were posed:

The opinions of support education teachers regarding the support education activities they have carried out with students with special learning difficulties are examined.

1. What are the opinions of students with special learning difficulties regarding their mathematical knowledge and skills, the difficulties they experience, the reasons for these difficulties, and the methods used to assess them?

2. What are their views on the planning, teaching strategies, methods and techniques, and evaluation of mathematics teaching with students with special learning difficulties?

3. What are the opinions of students with special learning difficulties regarding communication and collaboration with classroom teachers and parents?

4. What are their opinions regarding the challenges they face in their mathematics teaching practices with students with special learning difficulties, and what are the underlying causes of these challenges?

5. What recommendations can be made to enhance the efficacy of mathematics instruction for students with special learning needs?

The importance of research in this field cannot be overstated, as mathematics skills are one of the fundamental academic abilities that shape both academic and everyday life. For individuals with difficulties in mathematics, proficiency in this subject is not only crucial for success in academic settings but also essential for the maintenance of daily life skills. In Turkey, educational support services are provided through the use of support education rooms (SERs). In support education rooms, teachers provide supplementary educational support to students with SLD in the areas of reading, writing and mathematics, in accordance with their individual educational requirements. Given the absence of a discrete diagnosis for mathematical difficulties, it is crucial to ascertain the prevalence of such difficulties among students with SLD and to elucidate the experiences and perspectives of the support education teachers who interact directly with these students. It was postulated that one-to-one training of support education room teachers with these students would enable them to observe them more effectively and in greater detail, thus facilitating the collection of more data about students with mathematics difficulties. It is hypothesised that determining the level of mathematical difficulties experienced by students with SLD and the knowledge, experience and awareness of teachers working with them in the support education room about mathematical difficulties will prove useful for future studies. Furthermore, the findings of this study, which sought to ascertain the challenges encountered by educators in the SEA, will inform future research aimed at enhancing the quality of support education and facilitating the professional development of educators providing mathematics learning disabilities support.

The present study is limited in the following ways: The research is confined to the academic year 2022-2023.

1. The research is limited to 22 teachers who provide support education in nine primary schools with DEO in the Altınordu central district of the Ordu province.

2. The research is limited to the findings obtained from the interview form on mathematics teaching with students with special learning difficulties by the teachers working in the support education room.

3. The research is limited to the qualitative methods employed in the analysis of the data.

Methodology

Research Model

This study employs a holistic multiple case study approach, utilising qualitative research models. As posited by Stewart and Cash (1985), the interview, which constitutes one of the qualitative data collection methods employed in the study, represents a communication process based on a question-answer format, with a serious predetermined purpose and mutual interaction (Yıldırım & Şimşek, 2013, p.147). A semi-structured interview method, which is one of the qualitative data collection methods including open-ended questions, was employed in order to ascertain the experiences and opinions of teachers who provide support education with students with SLD about mathematics teaching in depth.

The research study group is comprised of teachers who provide special education services to students diagnosed with Specific Learning Disabilities (SLD) in the support education rooms of nine primary schools affiliated with the Ministry of National Education in Altınordu, the central district of Ordu province, during the 2022-2023 academic year. A total of 22 teachers were interviewed as part of the research process. In determining the study group, the criterion sampling method, one of the purposeful sampling methods, was employed, and the following criteria were established:

1. The study group was formed from teachers assigned to support education rooms within primary schools.

2. The participants in the study group continued to provide support education to at least one student with SLD in the DEO.

Data Collection Tool

In this study, a semi-structured interview form, developed by the researcher, was employed as the primary data collection instrument. The questions were presented to three experts for their input. In light of the expert feedback, amendments were made to the questions. Prior to commencing the interviews, two pilot interviews were conducted. At the conclusion of the interviews, participants were queried as to whether the interview was comprehensible. Based on the feedback obtained, no modifications were deemed necessary.

The data for this study were obtained from primary schools in the central district of Altınordu in Ordu, Türkiye. The participants were informed about the interview process and the ethical requirements that would be observed throughout. The audio recordings of the interviews conducted as part of this

research project were made with the consent of the participants. The audio recordings were subsequently transferred to a computer and converted into text. Three randomly selected audio recordings were presented to the thesis supervisor and a graduate student with expertise in qualitative research for verification and comparison with the corresponding transcripts. The content analysis method, one of the qualitative data analysis methods, was employed to analyse the data. In the existing literature, a variety of approaches to qualitative data analysis have been proposed. It can be argued that data analysis can be divided into two categories: descriptive analysis and content analysis. The distinction between these two categories is based on the depth of the analysis. The objective of content analysis is to identify concepts and relationships that can elucidate the collected data (Yıldırım & Şimşek, 2013, p. 259). The MaxQDA software was employed for the purposes of data analysis. The findings were represented visually using mind maps and graphics. The findings are supported by direct quotations, which are provided in conjunction with the relevant visuals.

Validity and Reliability

To enhance the credibility of this research, interviews were conducted in person and to the greatest extent feasible. Furthermore, to guarantee the veracity of the findings, the teachers were informed that they could review the written transcripts of the interviews at the conclusion of the session. In the Method section of the study, the characteristics of the participants, the criteria determined during the selection process, the process of developing the data collection tool, and the steps of data analysis were discussed in detail. Additionally, the studies conducted to realise the other dimension of credibility were explained in detail. In the sections pertaining to the determination and development of the data collection instrument, the conduction of interviews, and the analysis of data, the opinions of experts in qualitative research were sought and appropriate modifications were made in accordance with their recommendations. In order to ensure the study's transferability, direct quotations belonging to the sub-categories were included in the findings section. In order to ensure transferability, the sample was selected with great care and attention to detail. The criteria for selecting the study group were clearly defined, and the participants were chosen using the purposeful sampling method. In order to guarantee the confirmability of the research, all elements pertaining to the methodology and findings were presented in comprehensive detail. Once the analyses had been completed in accordance with the coder reliability study, two experts were invited to examine the compatibility of the findings and the content of the analysis. The evaluations indicated a consistency between the research data and findings.

Findings

The research findings indicate that the majority of teachers providing support education services for students with special learning difficulties do so because they are surplus to norms (*f* = 13). Other findings related to the reasons for providing support education include the desire to be useful to the student (*f* = 3), the presence of their own students (*f* = 4), and a genuine interest in doing so (*f* = 2).

The findings regarding the characteristics of students with SLD, as reported by teachers working in the support education room, are presented in Table 1. In consequence, the majority of teachers cited the difficulties encountered by their students in the cognitive domain.

Table 1.
Characteristics of Students with Special Learning Difficulties (SLD)

Category	Details
Cognitive Characteristics	Forgetfulness Difficulty learning to read and write Distractibility Difficulty understanding what is being read Learning late and with difficulty Being behind grade level Confusing similar letters Difficulty learning abstract concepts Difficulty with orientation skills
Social, Emotional, Behavioral Characteristics	Not wanting to study Lack of confidence Emotional problems Behavioural problems
Motor Skills	Weak fingers

With regard to the difficulty of forgetting what has been learned (*f* = 15), which is the most frequently mentioned issue in this area, P4 offered the following perspective: "Every activity we undertook, even after a relatively short period of time, typically around ten minutes, but sometimes even after a day, there was a significant issue with forgetting. This suggests that forgetfulness is a particularly pronounced challenge for these students." The most frequently cited attribute of students with SLD by support education teachers is their difficulty in learning to read and write (f=10). P18 stated that the subject in question was unable to read or write. "I focused my attention on developing his reading and writing abilities." She elucidated the challenges her students encountered in the domains of reading and writing. Teachers who provide support education to students with SLD indicate that their students typically demonstrate delayed and more challenging learning than their peers (*f* = 8).

Some participants (*f* = 6) also report that their students have limited attention spans, noting that children often have difficulty sustaining focus for

extended periods. P7 noted that the monotony of a lesson conducted solely with them at the table could become tedious. The participants indicated that they were reluctant to conduct lessons on the social, emotional, and behavioural characteristics of their students diagnosed with SLD (*f* = 6), that these students exhibited emotional and behavioural problems (*f* = 4), and that their self-confidence was insufficient (*f* = 4). While P13 articulated their students' reluctance to engage in learning activities, some participants also highlighted the lack of self-confidence among their students. P6 stated with regard to her students: "Both students exhibit a sense of disenchantment with the educational process, which manifests as a lack of engagement with the lesson at hand. In such instances, the child may lose significant ground in both academic and self-confidence terms. P4 observed that in the classroom, for instance, the child's peers are able to complete the task, yet the child's inability to do so leads to a withdrawal from the activity. The teacher also identified that the child's academic lag behind his peers was a source of concern. A teacher who provides supplementary educational support for a student with Specific Learning Disabilities (SLD) offered her perspective on the student's motor skills. P9: "In the classroom setting, he commenced at the earliest stage of the learning process. He becomes irritable when I request that he write the letters, and this is also the case in the classroom. Presently, he derives pleasure from the act of writing. Additionally, his finger development was also weak, as he was unable to write.

The second sub-problem of the study, which is the second sub-problem of the research, is to identify the mathematics learning areas in which students experience difficulties, to ascertain the reasons for these difficulties and to determine the methods for assessing these difficulties. The findings pertaining to the difficulties encountered by students with SLD in mathematics are illustrated in Table 2.

Teachers of mathematics in supportive education with students with SLD have indicated that rhythmic counting represents a significant challenge for their students within the domain of numbers (*f* = 16). P22: "Rhythmic counting represents a persistent challenge. Our students have not yet achieved proficiency in this area. If only we could stabilize the numbers, we would be in a position to advance. We maintain close communication with the class teacher on this matter. "We are attempting to resolve the issue with the numbers, but since the students have not made progress, we have not yet proceeded with rhythmic counting" (P6).

Furthermore, P6 highlighted the difficulties her student faced, particularly when counting backwards. "For instance, when counting backwards, he mentally processes the numbers as 1, 2, 3, 4, 5, 6, etc." He enumerates up to 20, then states 19. "Subsequently, he states 20, 19, and repeats this sequence each time, exhibiting a consistent forward and backward counting pattern." Furthermore, difficulties related to number perception (*f* = 8), writing numbers in reverse order (4), and forming patterns (*f* = 1) were identified as additional challenges encountered by the support teachers in their mathematics instruction with students diagnosed with Specific Learning Disabilities (SLD). In regard to the challenges encountered by the P10 student in number perception, the teacher noted that while the student is unable to demonstrate the requisite skills, he is nevertheless able to perform the associated counting task. "He is unable to select the appropriate numbers from the mixed numbers," while P9 highlighted his student's tendency to write numbers in an inverted orientation. "Furthermore, he is dyslexic and therefore displays a tendency to write letters in the incorrect orientation." To illustrate, the student in question wrote the numbers three and some other items in the incorrect orientation. After issuing a warning and providing corrective feedback, the student was able to demonstrate the correct writing of the numbers in question. A substantial proportion of the teaching staff (*f* = 13) indicated that their pupils encountered challenges in problem-solving. P7 indicated that only one of her five students with SLD was capable of solving problems involving a single operation. "Moreover, I am unable to facilitate problem-solving activities. Problem solving cannot be taught through problem solving; indeed, there are only a small number of students who are able to grasp the problem and then select the appropriate operation. The findings revealed that students with SLD encounter significant challenges in basic mathematical operations, particularly in subtraction and addition. P15 indicated that his student's challenges in backward rhythmic counting hindered his progress in learning subtraction. He observed that while his student demonstrated proficiency in addition and counting backwards, he encountered difficulties in subtraction. P12, conversely, indicated the challenge presented by his student's performance in addition with hands as follows: "He typically performs addition and subtraction without the use of hands, and when I transition to a hands-on approach for addition, he neglects to incorporate the additional hands into his calculations."

Furthermore, students with SLD also encounter difficulties in division operations. Some of the teachers who provided supplementary education (*f* = 6) indicated that their students encountered significant challenges in division operations. For instance, they encounter significant challenges when performing division operations (P1). P7 highlighted the challenges his student was facing in multiplication and division operations, noting that the student was unable to

progress to division due to difficulties in multiplication. The research findings indicate that another challenge faced by students with SLD in mathematics is the memorization of the multiplication table. P13 stated that the use of fingers to count, which is commonly observed in students with mathematics difficulties, was also evident in his student. He noted that while the student should be at a more advanced level, such as using the multiplication table when multiplying, they were still at the level of counting with their fingers or counting silently with their fingers. This indicates that they are unable to perform the operation in a more formal manner.

Table 3 shows the findings pertaining to the cognitive, affective, environmental, and genetic factors that contribute to these difficulties, as elucidated through the analysis of the opinions of teachers who provide supplementary education to students with SLD regarding the challenges their students encounter in mathematics.

The findings revealed that while some teachers (f = 4) attributed their students' difficulties in mathematics to a diagnosis of SLD, P14 stated, "The underlying cause remains unclear." "From my observation, it would appear that the family is already doing everything they can. It is possible that this is a characteristic of the family in question." Some of the participants indicated that their distracted attention was the underlying cause. P13 posited that their students' difficulties in mathematics were attributable to an inability to grasp abstract concepts. They observed that their students encountered greater challenges in grasping the abstract concepts inherent to the mathematics curriculum than they did with the more concrete concepts. Three teachers who provided supplementary education indicated that they observed their students' inability to recall previously learned material as a contributing factor to their difficulties in mathematics. P5 stated that, since the beginning of the academic year, there had been a persistent tendency for students to experience difficulties in retaining and recalling previously learned material. "A considerable amount of repetition is required."

Some participants postulated that the difficulties experienced by students with SLD in mathematics may be attributable to affective factors, such as anxiety and trauma, as well as an awareness of their own difficulties. P12 posited that traumatic experiences may be a contributing factor. While P4 asserted that anxiety is a significant contributing factor, P1 posited that another crucial element is the discrepancy between what their peers are able to accomplish and their own perceived limitations. Upon analysis of the opinions of support education teachers regarding the underlying causes of mathematics difficulties experienced by their students with SLD, it was observed that the majority of respondents cited the indifference of the families as a significant contributing factor (f = 8). P7 posited that the lack of interest on the part of the family may also be a contributing factor, given that the child was unable to learn in either the first or second grade, yet did not

Table 2.

Mathematics learning areas of difficulty

Findings Related to the Areas of Mathematics Learning in Which Students with SLD Experience Difficulty			
Natural Numbers	Basic Arithmetic Operations	Geometry	Measurement
Rhythmic counting Problem solving Number concept Writing numbers backwards Patterns	Addition Addition with carry Subtraction Division Memorizing the multiplication table Multiplication Difficulty with all four operations	Spatial relations Geometric shapes	Time

Table 3.

Causes of maths difficulties

Findings Related to the Causes of Mathematics Difficulties Experienced by Students with SLD			
Cognitive Causes	Emotional Causes	Environmental Causes	Genetic Causes
Because of the diagnosis of SLD Because of distraction Because of not being able to think abstractly Because of forgetting Because of different disabilities Because of not understanding what he/she reads	Trauma Anxiety Awareness of the difficulty experienced	Family indifference Distance education process Priority given to teaching reading and writing Not receiving preschool education	

receive any reinforcement. "He is currently in the third grade, but is receiving supplementary education from our institution at the fundamental level."

Some participants indicated that their students' inability to participate in distance education resulted in them falling behind the class level. P7 stated that in the fourth grade, two of their students were one level behind their classmates in mathematics. The reason for this lag in progress is distance education. As a consequence of their inability to participate in distance education, which is also a view expressed by their teachers, the children are falling behind, and this deficit is perpetuated. Two teachers indicated that prioritising the teaching of reading and writing was a contributing factor to their students' difficulties in mathematics. P7 posited that one of the reasons for the students' difficulties in mathematics was the lack of pre-school education. They observed that students who had started at kindergarten level one or two were receiving additional support, yet demonstrated less progress than their counterparts who had commenced their education at kindergarten. Three participants posited that the difficulties experienced by their students with SLD in mathematics were attributable to genetic factors. P5 posited that a health issue may be the underlying cause. "I postulate that there are some genetic congenital conditions related to health, but in general, I hypothesize that this is a health problem." The results obtained from the support education teachers regarding the methods of identifying the difficulties experienced by their students with SLD in mathematics are presented in Table 4.

Table 4.

Methods for identifying maths difficulties

Findings Related to the Methods of Teachers Providing Support Education to Determine the Mathematics Difficulties Experienced by Students with SLD	Determining the level of readiness
	According to in-class performance
	Getting information from class teachers
	By observation
	With question-and-answer method
	Using supplementary books
	According to the curriculum
	According to available documents
	By meeting with their families

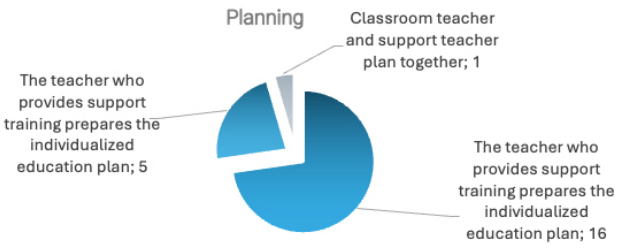
In order to ascertain the difficulties their students are experiencing in mathematics, teachers providing supplementary education undertake studies to determine their students' preparedness prior to instruction. In the course of the interviews, a number of teachers (*f* = 10) described the activities they undertake prior to the commencement of their teaching. P16 elucidated her students' preparedness for mathematical studies as follows: "Initially, the student is invited to attend the lesson, and no immediate preparation is undertaken. Instead, an initial period of approximately one to two weeks is allocated to familiarising oneself with the student. "I then take notes on the specific areas in which the student is deficient and subsequently create plans that address these gaps."

Some of the teachers (*f* = 8) indicated that they identified their students' difficulties in mathematics based on their in-class performance during the support education process. P16 indicated that she was able to identify her students' difficulties in mathematics during the lesson itself, stating, "As I spent time with the children, I was able to discern their deficiencies and adapt my approach accordingly." The finding (f=5) that the support education teachers received information from their students' class teachers while determining the difficulties of their students with SLD in mathematics is corroborated by K5's statement, "I am not the one who determines it, actually."

In more precise terms, the relevant information is sent to the CRC by the class teachers, who then proceed to make their plans. K1 states, "First and foremost, when the students first come to us, we discuss their situation with their teachers." Three of the interviewed teachers indicated that they identified their students' mathematical difficulties through observation. From the opinions of P11, who stated, "I mean, based on observation, based on what they do in the lesson," and P17, who asserted, "I determined it through observation," it was determined that they employed the observation method in their lessons. In addition, support education teachers employ a question-and-answer method (*f* = 2) to ascertain their students' mathematical difficulties. P13 expressed his opinion as follows: "While undertaking exercises, in a mutual question-and-answer relationship." Two teachers indicated that they identified their students' difficulties in mathematics by utilizing adapted activity books (UYET) developed by the General Directorate of Special Education for mainstreaming students and distributed to mainstreaming schools. P2 stated that the school also provides books for this purpose. The children's levels were determined by the researchers themselves, and the subsequent programme was initiated. P2 indicated that they had derived benefit from the UYET books.

The findings pertaining to the third sub-problem of the study, "Supporting the educational experiences of teachers in relation to mathematics teaching and adaptations for students with Specific Learning Disabilities (SLD)", were analysed according to the following sub-categories: planning, teaching methods and techniques, teaching materials, tools and equipment, and measurement and evaluation. The findings of the studies conducted by the support teachers at the planning stage of mathematics teaching are presented in Figure 1.

Figure 1.
Planning mathematics teaching in support education



A notable proportion of support education teachers (*f* = 15) indicated that they utilised the individualised education plans devised by the classroom teachers prior to commencing support education and mathematics instruction with their students with SLD. P1 stated that, at the planning stage, it is the responsibility of the classroom teachers to provide a plan, rather than that of the support education teachers. "We proceed in accordance with the aforementioned plan." Some of the support education teachers (*f* = 5) indicated that they conducted the planning independently. P22 expressed the following opinion on the matter: "Affirmative, I did so." The support plan was created following an in-depth understanding of the child's needs. It was developed independently and subsequently presented. "However, we must return to the initial point." One teacher indicated that the planning process was conducted in collaboration with the class teacher. P9 provided the following clarification: "Our objectives can be defined as follows: let us undertake these tasks, let us proceed in this manner, let us divide the work amongst ourselves."

The findings regarding the methods and techniques employed by the support teachers in teaching mathematics to their students with Specific Learning Disabilities (SLD) are illustrated in Table 5.

Table 5.
Teaching methods and techniques used in mathematics

Methods and Techniques Used by Support Education Teachers in Teaching Mathematics	By concretizing
	Continuous repetition
	By doing and living
	Question and answer method
	By way of presentation
	With daily life examples
	Teaching through games
	Drama
	Teaching through songs
	Induction
	Direct instruction
	Analogy
	one-on-one study
	Discussion
	Research-project method

The most common method employed by teachers of mathematics in support education rooms for students with SLD was found to be teaching by concretising (*f* = 13). P21: "In the context of mathematics lessons, we adopt a pedagogical approach that involves concretising the subject matter for the benefit of the child. In the event that additional resources, such as writing implements, art supplies, or a writing surface, are required, there is a greater range of options available due to the one-to-one ratio. P21 indicated that concrete materials, tools, and equipment are employed in mathematics lessons. The other method employed by teachers of mathematics in the support education room with students with SLD is learning through practical action and experience (*f* = 7). P8 articulated his perspective on the subject, stating, "Learning by doing and experiencing enables students to draw their own inferences."

Another method employed by support education teachers in mathematics lessons with their students with SLD is the question-and-answer approach (*f* = 6). P5 stated that the method of question and answer is employed on a repeated basis. P13 indicated that they employed a question-and-answer approach, stating, "I typically provide an explanation, then pose questions and assign exercises." In the course of the interviews, five of the teachers indicated that they employed presentational teaching in the context of mathematics instruction. P16 articulated his perspective as follows: "In the teaching of mathematics, which is predominantly conducted through the medium of presentation, I convey the requisite information and then prompt the student to apply it."

One pedagogical approach employed by mathematics educators is the use of real-world examples to illustrate mathematical concepts (*f* = 5). "The objective is to facilitate the children's mathematical operations in a way that is accessible to them in their daily lives. Therefore, academic success should be a secondary consideration, with the focus being on fostering familiarity with the practical aspects of life." P1 highlighted the value of incorporating real-world examples into his teaching. The research findings indicate that four teachers employ the game teaching method in mathematics lessons to support education. P5 expressed the following opinion: "Given the limited attention span of children, I attempt to incorporate games and play into my lessons." Other methods employed by teachers in mathematics lessons in support education include drama (*f* = 2), teaching with song (*f* = 2), and induction (*f* = 2). One participant identified the use of analogy, one-to-one work, direct instruction, discussion, and the research project method as methods employed in mathematics lessons in support education during the course of the interviews.

The findings regarding the teaching materials, tools and equipment employed by support education teachers in mathematics teaching are presented in Table 6.

Table 6.

Tools, equipment and materials used in mathematics

Teaching Materials, Tools and Equipment Used by Teachers Providing Support Education in Teaching Mathematics	Printed materials
	Standard mathematics materials
	Computer/internet resources
	Things/objects in the environment
	Teacher-made materials

In the context of mathematics lessons in support education, the analysis revealed that printed materials were the most frequently utilised tools, equipment and materials (*f* = 19). These materials include course books, adapted activity books prepared by the Ministry of National Education (MoNE) for mainstreaming students and sent to schools where mainstreaming is applied, as well as worksheets and other similar resources. P7 indicated that workbooks are a frequently utilized resource. P7 stated that they predominantly utilised printed materials in mathematics, citing workbooks as a particularly prevalent resource. In the case of some children, for instance, if they are in the third grade, there are two books from the MoNE books of the second grade, and one additional book for a lower grade. Following the observation of printed materials, it was also noted that teachers frequently utilised standard mathematical resources (*f* = 18). P8: "I prepared a variety of materials for use in rhythmic counting exercises, including puzzles, cardboard paints, dry paints, geometric shapes, and other objects." Subsequently, the range of available materials includes number blocks, base ten blocks, a geometry board and related geometric shapes. In addition, teachers employ computer and internet resources to support mathematics education (*f* = 12). P8 stated that the smart board was utilised extensively, with educational websites and videos displayed on it to capture the students' attention.

The findings regarding the measurement and evaluation methods employed by mathematics support teachers are shown in Table 7.

Table 7.

Measurement and evaluation methods in mathematics

Measurement and Evaluation Methods Used by Support Education Teachers in Teaching Mathematics	Observation
	According to individualized curriculum
	By doing the activities in the books
	Portfolio
	Verbal teaching/making the student explain
	Question-answer

One of the measurement and evaluation methods employed by support teachers in mathematics instruction was observation (*f* = 4). P12 stated, "As a consequence of observation, "Typically, this is conducted as part of our observation process." P19 indicated that he evaluated his students in accordance with their individualised education plans, which were related to measurement and evaluation in mathematics teaching. He stated, "I had already determined certain behaviours in the plans, as well as achievements." Three teachers indicated that they employed the activities outlined in the textbooks when conducting measurement and evaluation activities. P2 articulated his perspective on the subject as follows: "The textbooks already include questions directed at the students. I observe them. I ascertain their capabilities and limitations by posing a series of questions. "I am able to discern whether they have acquired the requisite knowledge or not." Two teachers indicated that they utilize homework and product files as a means of evaluating the work they have conducted in support of mathematics teaching. P19 indicates that homework and product files are utilized in measurement and evaluation, as evidenced by the statement, "These activities are compiled into a file." Other methods employed in the assessment of student performance include verbal evaluation and questioning (*f* = 2), as well as the use of question-and-answer sessions (*f* = 2). P13 outlined the assessment techniques utilized in mathematics lessons, noting that they employ a combination of questioning and observation to gauge student understanding.

The results pertaining to the fourth sub-issue of the study, namely the perceptions of DEO instructors regarding communication and collaboration with classroom instructors and the parents of students with special learning disabilities, are shown in Table 8.

Table 8.

Communication and co-operation

Findings Regarding the Communication and Collaboration of Teachers Providing Support Education with Classroom Teachers and Families of Students with SLD	
Sharing with class teachers	Sharing with families
Academic studies in support education and in the classroom	Repetition of work done at school
Behavioral problems	Other (health problems, family problems, etc.)

Teachers who provide mathematics support to students with SLD in the support education room share their academic work with the students' class teachers (*f* = 15). P8 states that they receive information from the classroom teachers about the students they provide support education for as follows: "Contact with the class teacher is established from the outset. "What is the situation of this child? What can we do to assist them? What can they do in class? What cannot

they do?" P9 stated that they shared homework with the class teacher, noting that this included both the homework they assigned and the homework assigned by the class teacher. On occasion, they will request assistance with a specific task, such as providing help with a particular assignment. On occasion, I will inform the teacher that I have provided the student with a specific task and request their input. P19 stated that she disseminated the educational materials she had created for the student to the student's class teacher. She gave the following example: "For example, with the class teacher, the student learned this today, or the student could not perceive this, or the student could not understand this. We learned about this subject." The findings of the research indicated that three teachers reported sharing behavioural issues with the classroom teacher. Teachers who taught mathematics to students with special educational needs (SEN) in the support education room indicated that they primarily discussed the repetition of schoolwork with their students' families. P1 articulated her perspective as follows: "We have made significant progress in the lessons with them. They are able to complete the same tasks at home. If the children are attending another educational facility, we provide guidance on how to proceed." The research findings indicate that some teachers (n=7) also reported sharing various issues with families. P12 indicated that some families discussed their specific challenges. "Undoubtedly, some individuals proffer their concerns, while others voice grievances about their spouses. They disseminate their problems in a multitude of ways. I endeavour to refrain from delving into these matters, yet I am compelled to address them nonetheless. The educators also highlighted the beneficial impact of their communication with the students' class teachers and families on the students and their families. P3: "When I present my student to his teachers, he responds positively. He appears to appreciate it when his teacher offers praise in his presence." "It is, undoubtedly, an invaluable resource." The results of the study indicate that some of the teachers who reported sufficient communication with families were also the classroom teachers of the students who received support education.

The findings pertaining to the fifth sub-problem of the research, namely "Support education teachers' opinions about the difficulties they encounter in mathematics teaching with students with special learning difficulties and the reasons for these difficulties", are presented in Table 9.

The majority of teachers who instruct mathematics to students with special educational needs (SEN) in a support education setting have indicated that the allocated support education hours are insufficient (f=6). P9 stated that they believed that removing students from the classroom for 1-2 hours on the support education day was an ineffective solution. It is this author's opinion that students receiving support education should be provided with a dedicated classroom. The findings of the research indicate that some teachers encountered difficulties due to insufficient physical conditions (f=5). In particular, there is a consensus that a separate classroom for support education is lacking, that departments such as libraries are being used for this purpose, and that the existing classrooms are suboptimal in terms of their physical environment. P9: "It is this researcher's opinion that students receiving support education should be provided with a dedicated classroom." The teacher is able to work with two or three students simultaneously, thereby significantly altering the nature of the classroom environment for students in the support education programme. "We are currently engaged in instruction within the library." Two of the interviewed teachers posited that providing support education outside of school hours is a burdensome undertaking for students. P17 posited that maintaining an excessive number of students on school grounds outside of scheduled classes can prove fatiguing for them. In regard to the challenges posed by the student population, the support education teachers indicated that a subset of students exhibited behavioural issues (f=5). P22 offered the following insights on the matter: The class teacher advised me to exercise caution, as the student in question has a history of violent behaviour. "He can vacate the classroom with minimal effort and relocate to any desired location with equal ease."

Table 9.

Difficulties encountered in DEO applications

Findings on the Difficulties Encountered by Teachers Providing Support Education in Teaching Mathematics to Students with SLD		
Difficulties with VIDEO Applications	Student-Related Difficulties	Difficulties Caused by the Teacher
Insufficient class hours	Behavioral problems	Lack of Knowledge and Experience
Insufficient physical conditions	Disinterest in the lesson	Other
Extra-school support education is tiring	Late and difficult learning	
	Not doing homework	
	Other	
Difficulties Originating from Families	Difficulties Experienced with Awareness	
Lack of interest from families	Families' perception of support education as a course	
Lack of awareness from families	Students' different perceptions of support education	
	Other	

Another challenge faced by educators is the lack of engagement exhibited by students with SLD in the learning environment (*f* = 4). P5: "He displays a notable lack of interest in the lesson, and thus requires some degree of compulsion to attend." P22 also identified a further challenge, namely that the student in question tends to adopt a defensive and uncooperative stance towards the learning process. He does not attend of his own volition. He attends class merely to engage in conversation with his companion and play with his cards. "Indeed, the child's willingness to learn is a crucial aspect that should be considered." The participants articulated their perspectives on the students' apparent reluctance to engage in learning activities. Some of the teachers indicated that delayed and challenging learning among students with SLD represented a significant challenge in the provision of specialised educational support (f=3). P15 proceeded to share his views on the matter as follows: "Other students with typical cognitive abilities demonstrate a higher level of comprehension, achieving at a commensurate level of proficiency. In contrast, these students exhibit a prolonged period of comprehension." Two teachers indicated that the students had not completed the assigned homework. P9 stated that none of his students had completed their homework and returned it by the designated deadline.

Indeed, we consulted with the counselling service on one occasion regarding one of my students. They consider the homework assigned by the teacher to be of greater value and importance. P9 indicated that his student had not completed the homework assigned in the support education programme. Some of the teachers (*f* = 3) indicated that they encountered challenges associated with the students, including memory lapses, inadequate preparation, and health issues. Teachers providing support education indicated that some families exhibited indifference (*f* = 8) and a lack of awareness (*f* = 5). P10 stated that the indifference of some families was a source of distress. "The lack of appreciation demonstrated by the family in response to the considerable effort invested by the educator is perplexing. Despite the seemingly minor nature of the contribution, the expectation is that the family will dedicate a similar amount of time on a daily basis to facilitate a more expedient outcome. However, when this commitment is not forthcoming, the educator is left with a sense of frustration." The interviewed teachers indicated that they encountered challenges related to awareness, including instances where students perceived support education in a distinct manner (*f* = 5), families viewed support education as a standalone course (*f* = 2), and a lack of awareness regarding the benefits and significance of support education within their local context (*f* = 2). P22: "They perceive it as a course in particular." He will attend the course and participate in private lessons. P22 also indicated that families have a different perception of support education.

The findings pertaining to the sixth sub-problem of the research, "Suggestions of support education teachers for increasing the effect of mathematics teaching with students with special learning difficulties", are presented in Table 10.

Teachers providing support education proffered suggestions for the improvement of the physical conditions in support education and mathematics teaching with their students with SLD (*f* = 6). P9 proffered his views on the subject. "As previously stated, it is my recommendation that a class be established under the designation of 'support education'. It is my further recommendation that this class be constituted as a serious academic undertaking." P4 posited that an appropriate educational environment and an adequate supply of teaching materials, tools and equipment should be provided. He further suggested that more enriching books could be purchased, which would be beneficial in that regard. Three of the interviewed teachers proposed an increase in the allocated support education hours. P8 posited that the duration of support education for the mathematics course should be equivalent to that

Table 10.

Suggestions for DEO applications

Suggestions of Teachers Providing Support Education Regarding Support Education Room Applications and Teaching Mathematics to Students with SLD	
Recommendations Regarding DEO Applications	Suggestions for Teachers Providing Support Education
Physical conditions should be improved.	Should know the student well.
Support education hours should be increased.	Should establish communication and emotional bond with the student.
Support education should be given by the student's classroom teacher.	Should be patient.
Legal regulations should be made	Should use appropriate teaching methods for the student.
Other	Should solve the student's behavioral problems.
	Should communicate with the student's classroom teacher and family.
Recommendations Regarding Awareness	Should give importance to repetition.
Education should be given to families.	Should be planned.
	Should be willing.
	Should gain students' self-confidence.
	Should make an effort for their professional development.

of the mathematics course itself. They stated, "For example, the standard Turkish curriculum comprises five hours of mathematics. It would be optimal for students to receive at least five hours of mathematics support." P21: "It is preferable to have one's own student." Indeed, having my own student proved to be of significant benefit. "I was therefore able to identify their deficiencies more accurately and ascertain where they were experiencing difficulties."

Two of the interviewed teachers posited that legal regulations should be established pertaining to ESL practices. In regard to the recommendations for educators providing supplementary instruction, all of the interviewed teachers (n = 22) asserted the importance of developing a comprehensive understanding of their students. P14 stated, "It is possible to overcome many academic challenges, but it is also essential to have a comprehensive understanding of the family and the child. Additionally, it is crucial to prepare the child for the future. Having a thorough knowledge of the child is of paramount importance." P15 emphasised the significance of the teacher developing a comprehensive understanding of the child, noting that this should be done from the outset, with the child's interests and abilities taken into account. The findings of the research indicated that teachers considered the establishment of communication and an emotional bond with the student to be a crucial aspect of their role. P1 articulated his perspective on the matter as follows: "It is essential to demonstrate that you comprehend his or her perspective." "If the student believes that he or she is not understood or that his or her trust is not warranted, he or she may respond in a manner that is incongruent with the desired outcome."

One of the suggestions put forth by the participants (f=8) is the utilisation of pedagogical approaches that are well-suited to the individual student. P10: The use of repetition and concrete materials, such as games, puzzles, and number blocks and cards, is recommended. "It is essential that concrete materials appeal not only to the brain but also to the five sensory organs of the child. This is particularly crucial in mathematics, as in all subjects." P10 highlighted the significance of employing pedagogical approaches and tangible resources that align with the learner's needs, particularly in the context of mathematics instruction. The findings of the research indicate that the resolution of behavioural issues among students is a key recommendation put forth by the teaching staff (f=5). P14: "I have previously addressed behavioural change in the context of supportive education, so I consider the academic aspect to be relatively less important." "If behavioural issues are present, they should be addressed initially," P14 asserted, indicating that behaviour change should be the primary focus.

Among the suggestions put forth by those who provide support education, there are also opinions that teachers should not prioritize their own professional development (f = 4). P17 emphasised the necessity for comprehensive training on SLD and its various manifestations, as well as on supportive education, for all classroom teachers. They asserted, "It is imperative that every classroom teacher undergoes training on the most prevalent characteristics of this type of student, both theoretically and practically." "It would undoubtedly be beneficial for them to gain experience in this area under the guidance of a teacher." Furthermore, he highlighted the importance of gaining experience. The research yielded several noteworthy findings. Among these was the opinion expressed by some of the teachers who provided support education services (f = 3) that communication between teachers and students' families, as well as between teachers and classroom teachers, is of great importance. P1 stated that it is necessary to meet with the parents and the class teacher individually in order to obtain their suggestions.

Three teachers proffered suggestions regarding the importance of repetition. P10 asserted that repetition is a crucial element in mathematics instruction, stating, "Effective planning and repetition are indispensable, particularly in mathematics." The findings revealed that the teachers in question also shared their opinions and suggestions regarding the importance of planning and enthusiasm among those providing support education. Additionally, they emphasised the significance of fostering self-confidence in students (f=6). P10: "It should be planned." "It is essential that the educator has a comprehensive understanding of the child and has prepared the necessary materials in advance." K8 highlighted the significance of meticulous planning and emphasised the importance of providing support education with genuine enthusiasm. They stated, "One should not engage in such activities merely for the sake of it. Instead, one should only undertake them if they are genuinely beneficial and if they are driven by a genuine desire to help." P14 posited that self-confidence is a crucial factor. In the absence of self-confidence, the child is unable to respond effectively to support education. I posit that these are of greater consequence for him. "I believe that the curriculum should be addressed at a later stage. It is also crucial to instill self-confidence in students." In terms of raising awareness, two participants emphasised the importance of family education. P5 stated that families lack sufficient awareness. "First and foremost, families require training."

Discussion and Conclusion Related to the First Sub-Problem

With regard to the initial sub-question of the study, namely, "What are the opinions of teachers engaged

in the provision of support education in the support education room with respect to the activities they undertake with students experiencing special learning difficulties?", it was determined that the majority of teachers in the support education room engage in support education as a result of their exceeding the norms for their respective roles. Additionally, other teachers opt for support education as a matter of choice, motivated by their desire to be of service to students. The Special Education Services Regulation (MoNE, 2018) sets out the legal framework for the assignment of special education teachers, pre-school teachers, classroom teachers and other field teachers in the support education room. The absence of norms for support education teachers in schools has resulted in the assignment of surplus teachers to this role.

Furthermore, classroom teachers with students diagnosed with SLD who are willing to do so provide support education to their own students or other students outside of school hours. In particular, classroom teachers of these students have indicated that they provide supplementary educational services outside of school hours, and that such services are beneficial for their students. As evidenced in the literature, individuals with SLD exhibit challenges in attention, perception, conceptual development, memory, problem-solving, and executive function skills. It is essential to investigate the causes of memory problems in order to guarantee that students derive benefit from the intensive information provided in schools and to ensure academic success (Yıldız, 2023). The difficulties they experience with attention have an adverse effect on their ability to learn effectively in other areas (Özmen, 2017).

Consequently, students with SLD tend to underperform academically and are more likely to fail. The findings of the study indicate that reading, writing and reading comprehension are the areas where teachers of students with SLD frequently encounter difficulties. Indeed, it can be stated that dyslexia is the underlying cause of approximately 80% of learning difficulties (Salman et al., 2016). Furthermore, the majority of individuals with learning difficulties also experience difficulties with reading (Çakmak, 2017). Furthermore, approximately 75% of students with SLD exhibit deficiencies in social skills (Kavale & Mostert, 2004). Furthermore, individuals with SLD may encounter difficulties in social relationships, such as exhibiting low self-confidence and a lack of social support (Cortiella & Horowitz, 2014).

Discussion and Conclusion Related to the Second Sub-Problem

With regard to the second sub-problem of the study, namely "the knowledge and skill levels of students with specific learning difficulties in mathematics, the difficulties they experience, the reasons and the methods of determination", it was established that students with SLD encountered difficulties in rhythmic counting, in acquiring the concept of number, and that there were students who wrote numbers upside down in the learning domain of natural numbers. One participant indicated that their students exhibited difficulties with pattern recognition. The fundamental operations of addition and subtraction provide the basis for more complex arithmetic operations. During the primary school period, students may exhibit a tendency to make systematic errors in addition and subtraction operations. It is crucial to conduct a thorough analysis of the source of errors in order to ascertain whether they are attributable to deficiencies in knowledge, misunderstandings, or dyscalculia. PLC is a specific developmental disorder that impedes the acquisition of arithmetic skills (Polat, 2021).

Multiplication can be defined as a repeated addition operation. A fundamental prerequisite for multiplication is a comprehensive understanding of the multiplication table. In particular, students who experience difficulties with memory and the recognition of specific patterns in multiplication are prone to challenges in memorising the multiplication table. As a consequence of these difficulties, they learn multiplication at a slower pace than their peers. Division is the inverse operation of multiplication. As students with mathematics learning difficulties experience challenges with multiplication, they also encounter difficulties with division (Cumhur, 2021). The ability to solve problems is a crucial skill that is integrated into mathematics curricula. The Turkish primary school mathematics curriculum includes problem-solving as a learning outcome at each grade level, commencing with the first grade. A review of the literature reveals that students with PLC experience challenges in problem-solving (Akgün, 2021). The findings of the study indicate that a minority of participants reported that their students with SLD experienced challenges in understanding spatial relationships, geometric shapes, and time concepts. It is hypothesised that this is due to the fact that teachers working in DEO prioritise numbers, arithmetic operations and problem solving in their studies.

The results of the study indicated that the most common reason for the difficulties experienced by students with Specific Learning Disabilities (SLD) in mathematics was the lack of interest from the family. Subsequently, it was posited that the presence of a diagnosis of SLD was the underlying cause of the observed difficulties in mathematics. Other reasons include genetic predisposition, distraction, inability to think abstractly, the distance education process, and the prioritisation of reading and writing instruction. The results of the research indicate that the teachers who provide support education in schools perceive the family's indifference to be the most common reason

for learning difficulties in mathematics. This may be interpreted as an indication that they perceive the causes of MLD to be environmental conditions. Furthermore, teachers cite additional environmental factors, namely the distance education process and inadequate education, as contributors to these difficulties. It can be posited that these factors contribute to the difficulties experienced by students with PLC. As Mutlu (2021) notes, Kaufmann et al. (2013) posit that individuals with dyscalculia exhibit disparate characteristics due to a confluence of environmental, cultural, prenatal, and postnatal factors, as well as social and emotional challenges. Nevertheless, environmental factors do not constitute the causes that lead to MLD. These factors result in students with mathematics learning difficulties exhibiting a type of SLD with heterogeneous characteristics. Furthermore, the teachers' attribution of certain PLC characteristics, such as anxiety, as causes indicates a lack of comprehensive understanding of the subject matter. The absence of a diagnosis for PLC also presents challenges for educators in differentiating these students from those with SLD. Furthermore, the teachers' limited understanding of the subject hinders their ability to provide informed opinions regarding the characteristics of students with and without SLD, as well as the underlying causes of their mathematical difficulties. Furthermore, it is a documented fact that students with SLD also experience difficulties with mathematics. To address these challenges, it is essential to diagnose the specific types of SLD and provide teachers in support education rooms with comprehensive information about the potential causes of mathematics learning difficulties and the criteria for diagnosis.

The teachers working in DEO stated that they determined the mathematical readiness of their students diagnosed with SLD predominantly at the outset of the instructional period. Subsequently, it was determined that the aforementioned educators ascertained their students' mathematical difficulties during the course of the lesson through a combination of observation, consultation with classroom teachers, question-and-answer sessions, and the utilisation of supplementary resource materials. One participant indicated that they determined mathematics difficulties in accordance with the curriculum, utilising existing documentation and conducting interviews with families. The findings indicate that support education teachers primarily identify their students' mathematical difficulties based on their observations and experiences during lessons. The findings of the study indicate that teachers do not employ systematic and documented measurement and evaluation techniques that can be implemented in the classroom. Instead, they determine the abilities of their students during lessons in collaboration with the teaching staff. It was found that teachers working in DEO do not employ a variety of methods concurrently when conducting assessments and evaluations. Furthermore, it would be more beneficial to ascertain the difficulties encountered by the student prior to the commencement of instruction by obtaining information from alternative sources (class teacher, families, etc.) external to the lesson.

Discussion and Conclusion

Discussion and Conclusion Related to the Third Sub-Problem

In light of the findings pertaining to the third sub-problem of the study, which pertain to the opinions of support education teachers on mathematics teaching with students with SLD, teaching strategies, methods and techniques employed, and evaluation, it can be concluded that the teachers primarily utilise the individualised education plan (IEP) prepared by the classroom teachers during the mathematics teaching planning stage. The remaining findings indicate that the planning is conducted by teachers who specialise in support education for students with SLD, and that the classroom teacher and the teacher providing support education collaborate in the creation of individualised education plans. It was not mentioned by any of the participants that the IEP unit forms part of the support education planning process. In accordance with the Regulation on Special Education Services, the responsibilities of the individualised education programme (IEP) development unit established in schools include ensuring coordination in studies related to the preparation, implementation, monitoring and evaluation of the IEP. The IEP unit is chaired by the school principal or deputy principal and comprises the school counsellor, the student's class teacher, field teachers, the student's parents and the student. The IEP unit bears responsibility for the preparation, implementation, monitoring and evaluation of the IEP (MoNE, 2018). It is recommended that this process be carried out not only by the class teacher of the mainstreaming student or the teacher working in the support education room, but also by the IEP unit. However, the findings indicate that the planning process is primarily focused on implementing the IEP, which is prepared by either the student's classroom teacher or the teacher providing support education. A single participant indicated that they collaborated with the classroom teacher in preparing the IEP. The findings of the study indicate that the utilisation of experiential and hands-on learning approaches, coupled with the incorporation of tangible materials and real-world scenarios, has a positive impact on student outcomes. The findings of the research indicate that teachers do not employ a range of evidence-based teaching methods as recommended in the literature. It can thus be argued that there is a need to ensure that teachers are informed about different evidence-based teaching methods. The findings revealed that

the majority of support teachers employed printed materials (textbooks, UYET books, worksheets, etc.) as instructional resources in their mathematics instruction with students diagnosed with Specific Learning Disabilities (SLD). Kunwar (2021) posits that the utilisation of concrete materials is an effective method for the presentation of content, particularly when employing multisensory techniques. Furthermore, greater emphasis should be placed on visualisation in mathematics teaching, with the utilisation of modern technology. The findings of the study indicate that the teachers surveyed reported utilising a range of tools and materials, including concrete materials, computer/internet resources and printed materials, to a significant extent in their mathematics lessons. The findings of the study indicate that teachers employed by DEO rely on multiple-choice tests, worksheets and examinations as the primary means of evaluating their mathematics teaching practices with students diagnosed with SLD. In their study, Yıldız and Atamtürk (2024) sought to ascertain the views of teachers on the support education room practices in primary schools. The researchers discovered that the teachers conducted evaluations in a manner consistent with those employed in general education. These included observation, progress reports, examinations, assessments of their students' abilities, and subject repetition. The results of this study yielded comparable findings. Furthermore, the IEP should be employed as a tool for monitoring and evaluating the teaching process with the student. The limited number of participants who stated that they took the IEP into consideration in their evaluations raises questions about the functionality and adequacy of the IEP.

Discussion and Conclusion Related to the Fourth Sub-Problem

The findings obtained from the fourth sub-problem of the study, which concerns the opinions of teachers working in DEOs regarding communication and cooperation with classroom teachers and parents of students with SLD, are as follows: The majority of teachers disclosed academic information and homework assignments to their students' classroom teachers. A minority of participants indicated that they had shared information about behavioural issues with their classroom teachers. The majority of teachers providing supplementary education indicated that their communication with their students' class teachers was adequate. Interpreting the findings, it can be stated that the students' status as classroom teachers enables them to communicate with families with greater ease. One of the most effective strategies for ensuring academic success is to engage families in their children's education. Furthermore, parents constitute a significant source of support in addressing the social needs of the student. The research indicates that family involvement in the educational process is associated with positive mental, emotional, and social development in children (Çalışkan, 2021). In order to facilitate effective communication with families and enhance school-family collaboration, it is essential to ensure the functionality of the IEP unit within educational institutions. Furthermore, the family of the mainstreaming student, and if appropriate, the student themselves, may also participate in this team. It is hypothesised that when the IEP unit fulfils its duties in a truly functional manner and includes families in the educational process, the difficulties experienced will decrease, and more communication and cooperation with families can be established. The frequent change of teachers working in support education may be a contributing factor to the lack of continuity in communication and cooperation with families.

Discussion and Conclusion Related to the Fifth Sub-Problem

During the course of the research, it was observed that some of the schools visited had repurposed rooms such as libraries and warehouses to serve as support education rooms. Furthermore, the research revealed that teachers perceive a lack of sufficient teaching materials, tools and equipment. This situation has a detrimental impact on teachers providing support education. In some cases, classroom teachers provide supplementary education outside of school hours. While research findings indicate that students benefit more from education provided by their class teachers, there are also opinions that this type of education outside school hours is exhausting for the students. Some participants indicated that students exhibited a lack of interest in the lesson and a reluctance to complete homework assignments because they were not their class teachers. Teachers who provide supplementary education to these students indicate that their knowledge and experience in this area are inadequate. During the interviews, it was observed that there was a lack of awareness among the participants regarding the distinction between special learning disabilities and dyslexia, with many conflating the two terms. Additionally, there was a lack of understanding about the specific nature of mathematics learning disabilities as a distinct form of SLD. With regard to the provision of support education, the fact that a considerable proportion of teachers are assigned to support education rooms on the grounds that they exceed the norm results in their participation in this practice without having the requisite knowledge in advance and in the face of significant challenges. The fact that teachers providing support education are required to perform this task on a temporary basis, the frequent change of teachers for this reason, and the high number of students in the classes may contribute to the emergence of these issues.

Discussion and Conclusion Related to the Sixth Sub-Problem

The sixth sub-problem of the research, which concerns the recommendations of supportive education teachers for enhancing the efficacy of mathematics instruction for students with SLD, was classified as recommendations pertaining to DEO practices, supportive education teachers, and awareness. It was thus determined that the most prevalent recommendation put forth by supportive education teachers with regard to DEO practices and mathematics instruction pertained to the enhancement of physical conditions. The suggestions included an increase in the number of support education hours, the provision of support education by the student's class teacher, the making of legal arrangements, and other recommendations, such as the involvement of different teachers in the provision of support education and the delivery of some courses online. Upon analysis of the suggestions put forth by support education teachers for teachers who provide support education and mathematics teaching, it became evident that a fundamental aspect of their recommendations was the importance of a thorough understanding of the student in question. Other suggestions include the establishment of an emotional bond and communication with the student, the demonstration of patience, the utilisation of teaching methods that are appropriate for the student, and the resolution of behavioural issues. Furthermore, the suggestions provided to teachers who provide support education and mathematics teaching include the implementation of professional development, communication with families, class teachers, repetition, structured planning, willingness, and the fostering of self-confidence in students.

In Turkey, students with specific learning disabilities (SLD) are not diagnosed separately according to the types of SLD. Nevertheless, it is a documented fact that there are students diagnosed with SLD who also have MLD. The subject of this research, mathematics learning disability, is less well-known among teachers than dyslexia. Some participants even employed the terms "dyslexia" and "learning disability" as synonyms. In order to differentiate between students who experience difficulties in mathematics as a result of MLD and those who do so due to environmental factors, it is essential to conduct a separate diagnosis. The inconsistency model, which is a valid diagnostic model, results in students being referred for diagnosis only after a period of time has elapsed since they commenced their education. This consequently leads to the identification of existing difficulties in students being delayed. Nevertheless, children who are at risk of developing PLCD display some indications of vulnerability from an early age. The findings of the study indicate that teachers lack the requisite knowledge and experience to provide effective educational and PLC support. It has been established that teachers lack sufficient knowledge regarding teaching methods, evidence-based teaching interventions, and measurement and evaluation methods employed in mathematics instruction for students with SLD. The IEP unit in schools is responsible for a range of duties and obligations, spanning the planning stage of supportive education, through to evaluation and monitoring. Nevertheless, none of the participants in the study made any reference to the IEP unit. Those providing supplementary education tend to perceive their role as primarily that of implementing the IEP devised by the classroom teacher. Furthermore, the lack of functionality of this unit may also result in inadequate communication and collaboration with families. A further issue is that of the physical conditions. Some of the educational establishments that were the subject of this study do not have a dedicated room for the delivery of special educational needs support. Consequently, such provision is made in other areas of the school, for example, libraries. A further issue is the lack of appropriate tools, equipment and materials. In the course of the interviews, a number of teachers indicated that they had attempted to procure the requisite tools, equipment and materials through their own efforts.

On the basis of the findings of the present study, a number of recommendations can be put forward for consideration in practice and for future research.

It is recommended that in-service training be provided to classroom teachers and teachers providing support education services on the types of specific learning disabilities, with particular emphasis on mathematics learning disabilities. Such training should include awareness, professional knowledge, and effective teaching methods.

It is recommended that these training sessions be conducted in the form of workshops.

It would be beneficial to implement a standardised approach to the role of support education teachers within educational institutions. It can thus be ensured that support education practices are carried out in a more efficient and regular manner.

It is recommended that the IEP unit, established in schools where inclusive education is implemented, be fully operational, and that support education services be carried out in collaboration with the relevant team.

It is recommended that prospective teachers receive training to enhance their awareness of OSA and its various manifestations.

It would be beneficial for teacher candidates to have the opportunity to observe training sessions in support education rooms during their teaching practice.

It is imperative that families are educated about SLD and its various manifestations.

It would be beneficial for researchers to include long-term longitudinal studies on mathematics learning disabilities in their work. Therefore, a contribution can be made to the diagnostic process related to MLD.

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