

# Classroom Teachers' Awareness, Difficulties and Suggestions about Students with Learning Disabilities in Mathematics

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## Abstract

Classroom teachers' awareness of the characteristics of students with mathematics learning difficulties is important for the planning and implementation of individualized intervention programs for students. This study aims to examine classroom teachers' awareness of students with mathematics learning difficulties, as well as the mathematics teaching strategies they apply according to their professional knowledge and experience and their approaches towards these children. Case study design, one of the qualitative research methods, was used in the study. The study was conducted with 5 classroom teachers working in 5 different provinces in Turkey in the 2021-2022 academic year. A semi-structured interview form was used to collect the data. The participants of the study were determined by the easily accessible sampling method. The interviews were recorded on a voice recorder with the permission of the classroom teachers, and the data obtained were analyzed by content analysis method. The results of the study show that the knowledge of classroom teachers about the concept of mathematics learning disabilities varies according to the experience and working time of the teachers, the majority of the teachers do not have sufficient knowledge, they do not receive special training about this situation in their undergraduate education and in the institutions where they work, their knowledge about the process of referring students with mathematics learning disabilities to the necessary institutions when they encounter students with mathematics learning disabilities is insufficient, and teachers feel themselves inadequate in the education of these students.

**Keywords:** Mathematics, Specific Learning Disabilities, Mathematics Learning Disabilities, Classroom Teachers, Special Education.

## Introduction

Every human being is born with individual differences. Each person learns in line with his/her interest, speed and ability, but it is not yet possible to create an educational environment that prioritizes the individual characteristics of each child in mass education. The education of children who differ significantly from their peers in terms of their individual characteristics is considered within the scope of special education and these children are characterized as individuals with special learning difficulties. In this context, an education program specific to children is planned and implemented (Eripek et al., 1996; Koç & Korkmaz, 2019).



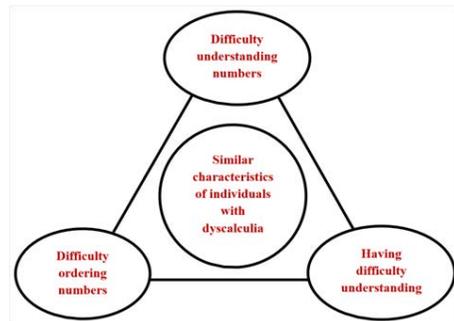
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Although the origin of the discussions on the scope and definition of the concept of specific learning disability dates back to the 1930s ([İlker & Melekoğlu, 2017](#)), it is defined as the difficulties that arise in the process of acquiring and applying speaking, listening, reading-writing, reasoning and basic mathematical skills ([Kirk, 1963](#); [MEB, 2006](#); [Şimşek, 2012](#)). Individuals with specific learning disabilities may experience difficulties in various skills such as mathematical operations, reading, writing, psycho-motor skills, recognizing and combining words, and reading comprehension ([Altun et al., 2011](#)). Specific learning disabilities are generally handled under four categories: reading difficulties (dyslexia), mathematics learning difficulties (dyscalculia), written expression difficulties (dysgraphia) and learning disorders that cannot be named ([Köroğlu, 2008](#)).

### Mathematics Learning Disability (Dyscalculia)

When the literature on mathematics learning disability is examined, it is seen that researchers use different expressions such as mathematical disabilities, arithmetic learning disabilities ([Koontz, 1996](#)), mathematics learning disorder or dyscalculia ([Morsanyi et al., 2018](#)), and disorder specific to arithmetic skills. Mathematics learning disorder is defined as a deficiency or disorder in various skills such as understanding and seeing numerical and spatial relationships, inadequacy in acquiring mathematical knowledge and skills, understanding mathematical relationships, recognizing and writing symbols, number concept, counting principles and learning arithmetic ([Beacham & Trott, 2005](#); [Mutlu, 2016](#)). [Köroğlu \(2008\)](#) states that individuals with learning disabilities in mathematics have difficulties in many areas such as careless, slow and incorrect calculations, difficulty in understanding terms, number symbols and magnitudes, visual perception, time perception, sequencing events and problem steps, recognizing and drawing geometric shapes, understanding fractions, daily life, money and calculations. These children have many common characteristics and common difficulties with other children who have the same problems as them. These common characteristics and difficulties may not be observed at the same rate in all individuals with

math learning disabilities. [Geary \(2011\)](#) classified the common characteristics of children with math learning disabilities as shown in the figure below.



**Figure 1 Common Characteristics of Individuals with Dyscalculia**

**Difficulty in understanding numbers:** Difficulties in distinguishing the signs of numbers, miscalculation, difficulty in four operation skills/slow solving, difficulty in understanding and solving problems, difficulty in time perception, difficulty in strategy making skills, difficulty in distinguishing the direction of operations, difficulty in learning fractions.

**Difficulty in ordering numbers:** Using fingers while doing operations, having difficulty in ordering or comparing numbers (big/small), having difficulty in determining the solution steps of problems, having difficulty in calculating change.

**Difficulty in understanding symbols:** Deficits in orientation skills, deficits in visual perception (difficulty in recognizing and drawing simple geometric shapes), confusion caused by symbols.

In the literature, there are both national and international studies aiming to determine the level of knowledge of classroom teachers and mathematics teachers about students with dyscalculia and their needs regarding dyscalculia ([Saravanabhavan & Saravanabhavan, 2010](#); [Sezer & Akin, 2011](#); [Şimşek & Arslan, 2022](#); [Wadlington & Wadlington, 2006](#); [Wadlington et al., 2006](#)). However, it can be said that there are very few studies on dyscalculia, especially in the national context, and more studies and in-depth information are needed ([Baldemir & Tutak, 2022](#); [Sezer & Akin, 2011](#)). Children with mathematics learning disabilities begin to be diagnosed especially in the first years of primary school. At this point,

classroom teachers working in primary schools play a vital role in dyscalculia ([Başar & Göncü, 2018](#)). In this context, this study is thought to fill an important gap in the literature.

**Method**

In this study, case study method, one of the qualitative research methods, was used. The most important feature of a case study is to investigate the depth of one or more situations. In this study, classroom teachers’ awareness of students with mathematics learning difficulties was tried to be evaluated comprehensively ([Yıldırım & Şimşek, 2013](#)).

**Participants**

In this study, five classroom teachers actively working in the Ministry of National Education were studied. The participants of the study were determined by convenience sampling method. Convenience sampling method is based on items that are available, quick and easy to reach. In this study, the participants were determined as people who volunteered to participate in the study and were easy to reach. The participants were coded as P1, P2, P3, P4, P5 in the order of application (Table 1).

**Table 1 Duration of experience of classroom teachers**

Teacher	Experience
P <sub>1</sub>	5
P <sub>2</sub>	31
P <sub>3</sub>	15
P <sub>4</sub>	5
P <sub>5</sub>	8

Although P1 and P4 had 5 years of experience, teachers with different experiences participated in the study.

**Data Collection Tool**

In this study, data were collected through semi-structured interviews. Three experts were consulted to ensure the content validity of the 8 questions in the interview form. As a result of this interview, it was seen that the questions in the semi-structured interview form were understood by the participants

and served the purpose. Interviews were conducted via telephone. The interviews lasted approximately 60 minutes and were recorded with a voice recorder. These records were then transcribed and made ready for analysis. The interview questions are as follows;

**Table 2 Interview questions**

Question 1	Have you heard of the concepts of dyslexia and dyscalculia before? Can you explain these concepts?
Question 2	Did you receive training on mathematics learning disabilities during your undergraduate education? If you have received training, do you think this training is sufficient? What did you learn about mathematics learning disabilities in this lesson? What should you have learned?
Question 3	What are your observations regarding the characteristics of students with mathematics learning difficulties?
Question 4	What methods and techniques do you recommend to be used in teaching mathematics to students with mathematics learning difficulties?
Question 5	To what extent do you feel competent in educating students with mathematics leaning difficulties?
Question 6	What are your thoughts on the responsibilities of families of students with mathematics learning difficulties?
Question 7	What are your observations about the issues that students with mathematics learning difficulties have difficulties in learning mathematics?
Question 8	Do students with mathematics learning difficulties experience mathematics anxiety? If they are alive; State the reasons that cause math anxiety. What approaches do you take to reduce math anxiety?

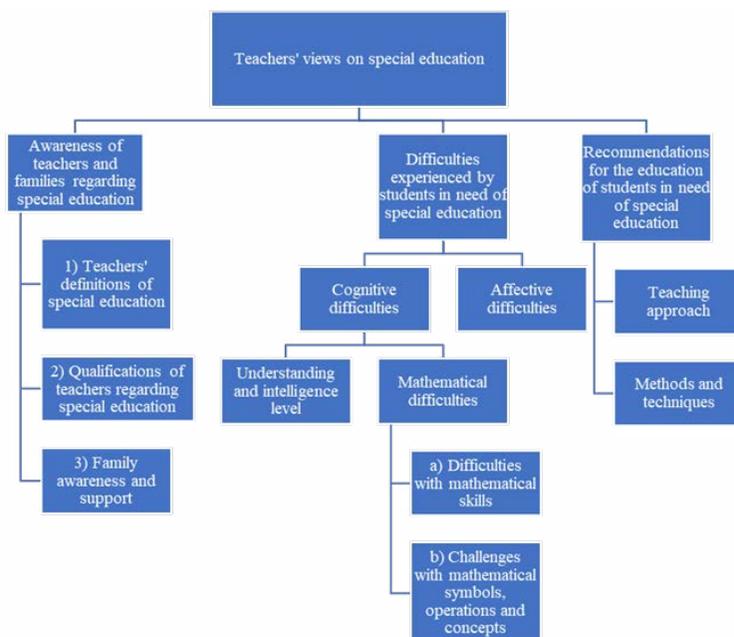
**Data Analysis**

The data analyzed by using the content analysis method. “Content analysis is to bring together similar data within the framework of certain themes and to interpret the data by organizing them in a way that the reader can understand” ([Yıldırım & Şimşek,](#)

2013, p.259). According to the answers given by the classroom teachers participating in the study, coding was made according to the concepts extracted from the data obtained. Themes were determined in order to collect the codings among certain categories. The data obtained were organized and interpreted according to the emerging themes.

**Findings**

In this section, classroom teachers’ awareness of students with mathematics learning disabilities is presented according to their observations and experiences in the classroom within the framework of interviews with classroom teachers (Figure 2).



**Figure 2 Teachers’ Views on Special Education Needs of Students**

**Awareness of Teachers and Parents about Special Education**

In this section, teachers’ definitions of special education, competencies, and family awareness and support are discussed.

**Teachers’ Definitions of Special Education**

When classroom teachers were asked about their thoughts on mathematics learning disability (dyscalculia), all of them stated that they had heard of this concept. While three of the teachers correctly defined dyscalculia, the other two teachers did not have sufficient knowledge.

The teachers stated that dyscalculia is a learning disorder (P2) and that the student has difficulty in reading comprehension, reading, writing and thinking skills (P1). P4 defined dyscalculia as “... a special difference that causes students with normal or above normal intelligence to have low success in

*reading and writing skills.*”

When the teachers were asked about their views on dyscalculia, it was determined that three of the teachers had heard of this concept before, one teacher could not remember, and the other teacher had never heard of it. The teachers who expressed their opinions about dyscalculia stated that dyscalculia is a learning disability in mathematics (P5, P4), and that this concept is used for students who are less successful than their peers in mathematical numbers, symbols and calculations, in the development of mathematical skills, in problem solving situations, in mathematical reasoning, and who sometimes cannot even use their hands in calculations (P1). Considering the teacher’s experience (P1-5 years) and the frequency of working with special children, it was seen that the teacher’s awareness varied.

## Teachers' Competencies related to Special Education

Three of the classroom teachers who participated in the study stated that they received training during their undergraduate education, while two of them stated that they did not receive training. The teachers who received training stated that they did not find the training they received sufficient. P5 *"... It was mentioned that we should try different ways in learning difficulties and that one way will surely carry that student forward. Although this is basically a correct statement, it would have been better to have a wider range of practical training to guide these paths. In fact, the basis of mathematics is reading comprehension and interpretation. I think students who cannot learn to read with the constructivist method also have problems in mathematics learning."* and drew attention to the need for practical training. P2 *"... Children should learn with games. There should be separate classes for math. They should learn addition or subtraction with small wooden cylinders, cubes, etc. A garden should be used for calculating the perimeter. By doing and experiencing, all pre-service teachers should first learn by themselves and then educate children."* Again, she emphasized the importance of learning applied teaching methods during the training process of pre-service teachers.

When the classroom teachers were asked to what extent they felt adequate for the education of students with mathematics learning difficulties, three teachers felt adequate, while the other two teachers stated that they did not feel adequate. P1 stated that she followed the current resources on the subject and participated in related training seminars, while P4 stated that she did not consider herself sufficient because they did not receive training on how to teach special students in their own classrooms during their undergraduate education.

P3 said, *"I consider myself sufficient, but I believe that it would be more efficient if more experts in their field gave one-on-one lessons."* P1 said, *"I follow current sources, I try to attend training seminars on this subject, I try to read publications on dyslexia or dyscalculia."* P5 said, *"There will be times when I am not sufficient; but I see those times as learning opportunities for myself by struggling."*

Although teacher support and dedication is a very important factor in the education of children with dyscalculia, it is not sufficient alone. These children should receive special education support from special education institutions outside the classroom in line with their needs, and classroom teachers should support the student in the light of this educational planning and support the progress of the process.

## Family Awareness and Support

According to the opinions of classroom teachers about the responsibilities of the families of students with dyscalculia, the importance of families in the development of students' academic achievement is great. They stated that these students with dyscalculia need more attention and special education support, and in cases where the family does not provide the necessary support, more burden is placed on the shoulders of the teacher. A significant number of classroom teachers drew attention to the cooperation between family, school and teacher. They stated that they observed that the child's academic achievement increased with the cooperation provided. However, they stated that if the necessary cooperation is not provided by the family, the child is deprived of the special education he/she should receive.

In cases where there is no family support, teachers stated that families are indifferent, unconscious or do not accept their child's problem for various reasons. They stated that if the family knows about the problem but is indifferent to this situation, they take care of the child themselves. P5 suggested that families should be given training on the subject in order to raise their awareness. P1 stated that some families unfortunately tend to hide or ignore their children's special situations in order to prevent their children from being exposed to some stigmatization. P3 stated that some families realize the situation and direct their children to other fields, but some families do not accept the situation and think that their children are lazy. According to the teachers' views, considering that individuals with dyscalculia need special education and support, their academic development is negatively affected when they lack family support, which is the most important pillar of this support.

### Difficulties Experienced by Students in Need of Special Education

All of the classroom teachers participating in the study stated that they had students with specific learning difficulties in their classrooms. Classroom teachers responded to the question “What are

the characteristics of students with mathematics learning disabilities?” by expressing the difficulties experienced by students with dyscalculia in mathematics. When Figure 3 is examined, the difficulties experienced by the students are discussed in two categories: *cognitive and affective difficulties*.

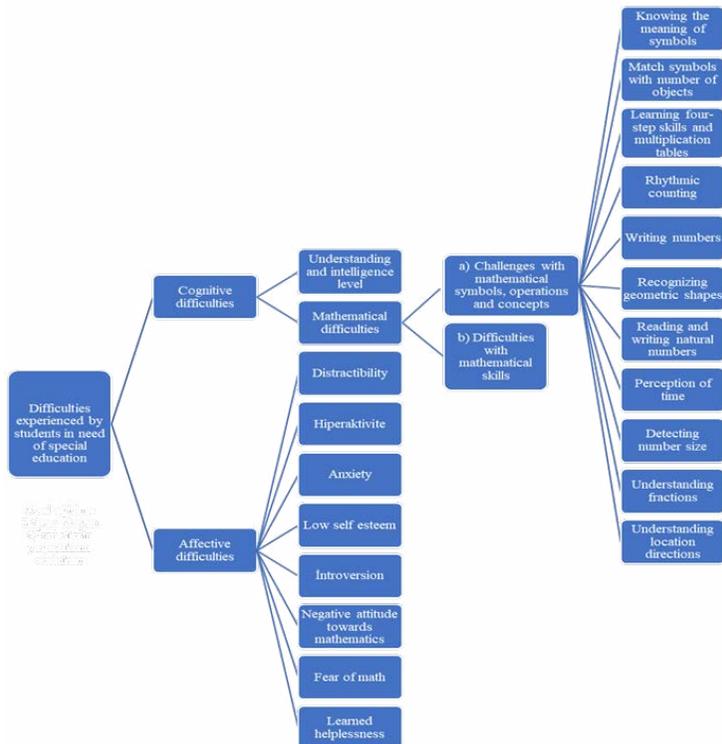


Figure 3 Difficulties Experienced by Students in Need of Special Education

#### Cognitive Difficulties

Cognitive difficulties were divided into two groups: *low level of comprehension and intelligence* and *mathematical difficulties*. Regarding the low level of intelligence, the teachers said, “Children with mathematics learning difficulties have less developed areas of mathematical intelligence or they learn later.” (P3) and “they have difficulty in moving from abstract to concrete” (P5). Mathematical difficulties were discussed in two categories: difficulties with mathematical symbols, operations and concepts and difficulties with mathematical skills. Under the title of difficulties related to mathematical symbols, operations and concepts, it was observed that the classroom teachers emphasized the following characteristics: not knowing the meaning of symbols, not being able to match symbols with the number

of objects, difficulty in learning 4 operations skills and multiplication tables, difficulty in rhythmic counting, writing numbers backwards, not being able to recognize geometric shapes, difficulty in reading and writing natural numbers, difficulty in perceiving time and difficulty in understanding fractions. For example, P2 said about a student, “He does not know the concept of number. He cannot learn numbers. Numbers are just shapes for him. In other words, the child does not know that the number two corresponds to two fingers. He can write numbers up to 20, but he does not know what these numbers correspond to. When I ask him to show 5 fingers, he can show up to three or four, but he cannot comprehend that 5 fingers correspond to the number 5.” The teacher stated that the student could not match the symbols with the number of objects. Teachers also emphasized

the lack of mathematical skills under the category of mathematical difficulties. They stated that students had difficulties in problem solving, critical thinking, reasoning and associating mathematics with daily life, other disciplines and concepts. For example, P1 stated that students *“lag behind their peers in numerical reasoning, logic and reasoning skills, and critical thinking compared to their peers.”* and P5 stated that *“Students cannot forget and use what they have learned when they move on to another subject, so they cannot establish relationships between concepts.”* They expressed as follows. P1 stated, *“In their daily lives, for example, when they go to the market, they have trouble calculating change and calculating how much money they have spent. These problems also cause social phobia in children.”* P1 emphasized that students have difficulty in associating mathematics with daily life.

### **Affective Challenges**

In addition to cognitive difficulties, classroom teachers reported that students experienced affective difficulties. The findings show that students face many affective difficulties such as distraction, hyperactivity, anxiety, lack of self-confidence, introversion, negative attitude towards mathematics, fear of mathematics and learned helplessness. Classroom teachers stated that children with learning disabilities are generally withdrawn, experience loss of self-confidence due to exposure to negative behaviors, and have problems expressing themselves. They stated that they show learned helplessness and negative attitudes towards mathematics, especially because their failures in mathematics are perceived negatively by their environment. Some of the teachers stated that these children experience two extremes; some children are very quiet and do not want to participate in class, while others are overly active and show negative behaviors towards their friends. The reason for this situation is the negative behaviors that the child is exposed to by his/her family or teacher and the constant feeling of failure. P1 stated that *“I observe a phobia and helplessness towards mathematics, a decrease in interest in other subjects because of not being able to realize oneself in mathematics, as well as “distraction and hyperactivity”.*

### **Recommendations for the Education of Students in Need of Special Education**

The classroom teachers participating in the study were asked about their suggestions for the education of students in need of special education. The findings were categorized under two main headings: *suggested teaching approach and suggested methods and techniques.*

In the context of teaching approach, the classroom teachers stated that the education of students with special needs should be done directly by special education specialists, the needs of the child should be determined, positive discrimination should be made for these students, individual time should be allocated in and out of class, students should be given additional time, self-confidence should be gained with a positive approach and cooperation with the family should be made. P2 stated that *“special time should be allocated for these children and special education specialists should provide education”* and P4 stated that students *“should receive education according to the individualized education program”*. P1 stated that *“These children should be treated sensitively and positive discrimination should be made in some issues. In a class of 40 students, if you explain to these children the way you explain to other children, you will lose the child in the class. You would be ignoring him/her”* and stated that positive discrimination should be given to students.

In the context of suggested methods and techniques, they stated that students can be taught outside the classroom, students can be taught especially with the support of concrete materials, students should repeat frequently, approaches such as gamification, visualization, one-to-one education and learning by doing and experiencing can be used in the education to be given to students. For example, P2 said, *“You should not be able to teach something without drawing shapes, without using materials, without involving the child. These children should receive special education. Apart from the education in the classroom, a certain hour should be allocated to them and frequent repetitions should be made with materials by making mathematics completely concrete.”* P2 emphasized the importance of concrete material-supported education. P5, on the other hand, stated the following about the need for frequent

repetition: *“When the subject is given, plenty of examples should be given, frequent repetition should be done and enough time should be given to the student”*. Another issue emphasized by the teachers is the planning of education according to the needs of the child. Teacher P5 made suggestions such as determining the points where students are deficient in detail and creating an individual plan, creating environments where they can feel success, paying attention to the transition from simple to complex, from near to far, from concrete to abstract since they are slow in high-level thinking skills, and associating them with life by giving more examples.

P1, P2 and P5 teachers stated that the child who was subjected to the right educational interventions with regular and planned cooperation reached the level of his/her peers, and that the child’s mental state improved after a certain period of time by using educational methods appropriate to the child’s needs in a systematic way. P1 said, *“I witnessed that the child who was subjected to the right educational interventions with regular and planned cooperation reached the level of his/her peers. I saw that after being diagnosed with specific learning disabilities and receiving special education for a few years, he/she did not receive the same diagnosis in the institution where he/she went for re-diagnosis. For example, I had a 3rd grade student who had difficulty learning the multiplication table. I was observing behavioral disorders along with high math anxiety in the child. We started to work on multiplication tables with the gamification method. For example, while playing hopscotch, I would include the multiplication table. When the child reached the 5th grade, I observed that he memorized the multiplication table and his success in other courses increased significantly”*, and drew attention to the fact that the academic performance of students increased with the right educational intervention.

### **Conclusion, Discussion and Suggestions**

In this study, classroom teachers’ awareness of students with mathematics learning difficulties, the mathematics teaching strategies they apply according to their professional knowledge and experience, and their approaches towards these children were examined. As a result of the study, although there were some teachers who had never heard of the concept of

dyscalculia, the majority of the teachers were able to define this concept, albeit partially. Similarly, [Büyükkaracı and Akgün-Giray \(2023\)](#) conducted a study with prospective classroom teachers and found that prospective teachers knew the concept of dyscalculia, although not in depth. Some of the teachers confused the concepts of specific learning disabilities and mathematics learning disabilities (dyscalculia). As a result of the interviews with the classroom teachers who participated in the study, the majority of the teachers who expressed opinions about the concept of dyscalculia expressed this concept as students’ inability to perform basic four operations, inability to understand/learn mathematical problems, inability to comprehend numbers and digits, and inability to understand abstract concepts. Similarly in the literature, learning disabilities in mathematics are classified as difficulties in number perception, accurate and fluent calculation, reasoning and problem solving ([American Psychiatric Association \(APA\), 2013](#)).

The opinions of classroom teachers about the causes of dyscalculia are intelligence level, prejudice against mathematics, distraction and hyperactivity, self-confidence problems, and inability to understand commands. Although students with dyscalculia do not have any disadvantage in terms of intelligence level, they are children who do not find the motivation, interest and experiences necessary for teaching, and the reasons for the special learning disability they experience are independent of intelligence ([Görgün & Melekoğlu, 2019](#)). Teachers who state that students’ mathematical intelligence does not develop have misinformation about individuals with dyscalculia. Attention deficit and hyperactivity, self-confidence problems, behavioral disorders, problems in social relations can be seen together with learning disabilities, but they do not constitute a learning disability on their own. Learning disabilities can be seen together with some emotional and mental reasons, but they are not a direct result of these reasons ([National Joint Committee on Learning Disabilities Definition of Learning Disabilities \(NJCLD\), 1990](#)). As it is understood from this definition, it is understood that the knowledge of classroom teachers about the characteristics of individuals with dyscalculia is not

sufficient. Considering that early diagnosis is an important factor in dyscalculia, it is thought that this situation may negatively affect the diagnosis process of students. Classroom teachers should know how to approach a student who has any of the specific learning difficulties in their class. For this reason, having information about both the individual and general characteristics of individuals with dyscalculia will help the planning and implementation processes of individual education programs to be prepared for students to be successful.

In the light of the opinions on the responsibilities of the families of individuals with dyscalculia, classroom teachers stated that students with dyscalculia should be supported by their families and that family, school and teacher cooperation is important. The majority of classroom teachers stated that although family support is important, most families do not provide support. According to the opinions, most of the families think that the teacher should take this responsibility. Classroom teachers attributed the reason for this situation to families' lack of interest, lack of awareness or low awareness. In addition, even if some families are aware of the special situation of their students, they insist on not accepting the situation and not providing special education in order not to be criticized. Teachers should also be aware of their responsibilities in order to ensure cooperation between family, school and teacher. The classroom teacher has a great role in informing the family about dyscalculia, trying to establish cooperation with the family and supporting the family in education.

When the opinions of classroom teachers about the methods and techniques they use in teaching mathematics to students with dyscalculia were examined, some of the classroom teachers stated that they use visual elements and make abstract concepts concrete with materials. Some of the teachers stated that they work one-on-one with their students with dyscalculia. Individualization of teaching in terms of the academic development of students with learning disabilities yields positive results. Considering that individuals with learning disabilities need different areas of education, supporting these individuals sufficiently can prevent students from isolating and comparing themselves with their peers. Similarly,

in the study conducted by [Altun and Uzuner \(2016\)](#), according to the opinions of classroom teachers on the education of students with specific learning difficulties, teachers stated that they are interested in such students one-on-one and try to do activities according to the needs of the student. In addition, teachers stated that they try to show a positive approach and interest to these students, repeat the subject, avoid complex expressions and get help from the guidance service when necessary.

Classroom teachers listed the situations in which students with mathematics learning difficulties have difficulty in learning mathematics as writing numbers and numbers backwards, four operations skills, understanding mathematical symbols, recognizing geometric shapes, multiplication table, reading and writing natural numbers and problems. In the studies conducted on the subject, individuals with dyscalculia have difficulty in mathematical calculations that require complex operations. With the increase in the complexity level of mathematics questions, the inadequacy in students' memory and learning strategies causes negative effects on their learning performance ([Bender, 2014](#)). Students with dyscalculia have difficulty in following the steps used in math problems. In order to improve students' ability to solve mathematical problems, long problems with many steps should be divided into shorter and more meaningful steps, important parts of the question should be underlined with colored pencils, and shapes should be used in problem solving ([Sezer & Akin, 2011](#)). Other subjects in which students have difficulty are addition-subtraction, multiplication and division. Teachers stated that students had difficulty in multiplication operations as the number of digits increased, they could not memorize the multiplication table, they had difficulty in rhythmic counting, they could not establish the addition-multiplication relationship, and they had difficulties in addition operations with the product. However, they did not mention the number line and fractions, which is one of the most common problems experienced by students.

Classroom teachers listed their observations about the causes of mathematics anxiety in students with mathematics learning difficulties as teacher and parental reactions, parental expectations, lack of self-

confidence, comparison with peers, long computation time and feeling of failure. Mathematics anxiety, which is one of the biggest obstacles to learning mathematics, causes individuals to show low study performance and does not allow them to reveal their current potential. When we evaluate mathematics anxiety in terms of children with dyscalculia, it is seen that these children have very high anxiety due to their inability to do mathematics. These children have normal and above normal intelligence levels. In some cases, their dyscalculia causes them to be exposed to unconscious attitudes and behaviors by both parents and teachers. With the right teaching approaches, the anxiety levels of children with learning difficulties should be reduced, and the child should be able to use mathematical skills supported by teaching strategies specific to this field.

The teaching approaches used by classroom teachers to reduce mathematics anxiety caused by the above-mentioned reasons for students with mathematics learning difficulties are listed as sub-themes in the form of fun activities, gaining self-confidence, giving extra time and having a positive approach. The teaching methods exhibited by the teachers support the literature studies. Implementation of mathematics curricula with daily life activities, fun and educational animations, integrating the lesson with games, etc. will help reduce the anxiety of children with dyscalculia (Geist, 2010).

The majority of classroom teachers stated they did not consider themselves adequate for the education of students with dyscalculia. The reason for this is that they did not receive a special education specific to the field in undergraduate education, each child has different characteristics and they are constantly learning new things from them. Classroom teachers stated that they could not pay much attention to special students because of the crowded classrooms and the necessity of raising the curriculum, and that the education programs were far above the level of these children. Participant teachers stated that students with dyscalculia should receive support from special education specialists, guidance services and family members. Similarly, Bevan and Butterworth (2002) reported that classroom teachers found mathematics curricula to be difficult and complex and therefore inappropriate for students with dyscalculia.

Two of the teachers stated that children could make progress at their own level if they were taught with the right teaching strategies, but they could not reach the level of their peers. Other teachers, on the other hand, stated that children who are subjected to the right educational interventions with regular and planned cooperation reach the level of their peers, and that the child's mental state improves after a certain period of time by using educational methods appropriate to the child's needs in a systematic manner. Being aware of the subjects in which students with dyscalculia have difficulties, knowing the characteristics of individuals with dyscalculia, having knowledge about how to approach these students, and implementing individually tailored education plans will help students progress in the area in which they have difficulty and increase their performance (Mutlu & Aygün, 2020).

Based on the findings obtained from the research, the following suggestions can be made;

- Courses related to special learning disabilities and dyscalculia, one of its subclasses, should be given in undergraduate education. It is thought that the number of students with dyscalculia is too high to be ignored.
- In-service trainings can be given to classroom teachers to increase their awareness about specific learning disabilities and math learning disabilities and to improve their professional knowledge.
- Trainings can be given to families about special learning disabilities and dyscalculia in order to ensure school, family and teacher cooperation.

## References

- Altun, T., Ekiz, D., & Odabaşı, M. (2011). A qualitative study on reading difficulties faced by primary teachers in their classrooms. *Dicle University Ziya Gökalp Journal of Faculty of Education*, (17), 80-101.
- Altun, T., & Uzuner, F. G. (2016). Views of primary school teachers about education of students with specific learning difficulties. *International Journal of Social Science*, (44), 33-49.
- American Psychiatric Association. (2013). *DSM-V-<sup>TM</sup>- Diagnostic Criteria Reference Manual* (E. Köroğlu, Trans.).

- Baldemir, B., İç, Ü., & Tutak, T. (2022). The views of pre-service elementary mathematics teachers' on Dyscalculia. *Bolu Abant İzzet Baysal University Journal of Faculty of Education*, 22(1), 485-505.
- Başar, M., & Göncü, A. (2018). Clearing misconceptions of primary school teachers' about learning disabilities and evaluation of teacher opinions. *H. U. Journal of Education*, 33(1), 185-206.
- Beacham, N., & Trott, C. (2005). Screening for dyscalculia within HE. *MSOR Connections*, 5(1), 1-4.
- Bender, N. W. (2014). *Individuals with Learning Disabilities and their Education, Characteristics, Diagnosis and Teaching Strategies* (H. Sarı, Trans.). Ankara: Nobel Academy Publishing.
- Bevan, A., & Butterworth, B. (2002). *The responses of students and teachers to maths disabilities in the classroom*.
- Butterworth, B. (1999). *The Mathematical Brain*. London: Macmillan
- Büyükkarcı, A., & Akgün-Giray, D. (2023). Approaches of primary teacher candidates to mathematics learning disability (*Dyscalculia*): Focus group interview. *SDU Faculty of Arts and Sciences Journal of Social Sciences*, (59), 364-376.
- Chinn, S. (2004). *The Trouble with Maths: A Practical Guide to Helping Learners with Numeracy Difficulties*. Routledge.
- Çakıroğlu, O. (2017). Introduction to specific learning disabilities. In M. A. Melekoğlu and U. Sak (Eds.), *Learning Disabilities and Special Learning* (pp. 2-22). Ankara: Pegem Academic Publishing.
- Eripek, S., Özyürek, M., & Özsoy, Y. (1996). *Retarded Children. Introduction to Special Education*. Karatepe Publications.
- Geary, D. C., Hamson, C. O., & Hoard, M. K. (2000). Numerical and arithmetical cognition: A longitudinal study of process and concept deficits in children with learning disability. *Journal of Experimental Child Psychology*, 77(3), 236-263.
- Geary, D. C. (2004). Mathematics and learning disabilities. *Journal of Learning Disabilities*, 37(1), 4-15.
- Geary, D. C., Hoard, M. K., Byrd-Craven, J., Nugent, L., & Numtee, C. (2007). Cognitive mechanisms underlying achievement deficits in children with mathematical learning disability. *Child Development*, 78(4), 1343-1359.
- Geary, D. C. (2011). Consequences, characteristics, and causes of mathematical learning disabilities and persistent low achievement in mathematics. *Journal of Developmental and Behavioral Pediatrics*, 32(3), 250-263.
- Geist, E. (2010). The anti-anxiety curriculum: Combating math anxiety in the classroom. *Journal of Instructional Psychology*, 37(1), 24-31.
- Gifford, S. (2006). Dyscalculia: Myths and models. *Research in Mathematics Education*, 8(1), 35-51.
- Görgün, B. (2017). Diagnosis of specific learning disabilities. In M. A. Melekoğlu & U. Sak (Eds.), *Learning Disabilities and Special Ability* (pp. 53-76). Pegem Academic Publishing.
- Görgün, B., & Melekoğlu, M. A. (2019). Development of a reading support program for students with specific learning disabilities to improve reading fluency and comprehension skills. *Elementary Education Online*, 18(2).
- İlker, Ö., & Melekoğlu, M. A. (2017). Review of the studies on writing skills of students with specific learning disabilities in elementary education. *Ankara University Faculty of Educational Sciences Journal of Special Education*, 18(3), 443-469.
- İşeri, E., & Sarı, A. (2008). Cognitive development and disorders in children: Mental retardation and learning disorders. In S. Karakaş (Ed.), *Cognitive Neurosciences*, MN Medical and Nobel Medicine Bookstore Book.
- Kirk, S. A. (1963). Behavioral diagnosis and remediation of learning disabilities. *Conference on Exploration into the Problems of the Perceptually Handicapped*.
- Koç, B., & Korkmaz, İ. (2019). An action research on teaching addition and subtraction to an illiterate dyscalculic student. *Journal of*

- Qualitative Research in Education*, 7(2), 710-737.
- Koontz, K. L. (1996). Identifying simple numerical stimuli: Processing inefficiencies exhibited by arithmetic learning disabled. *Mathematical Cognition*, 2(1), 1-23.
- Korkmazlar, Ü. (1993). *Special learning disorder (Special Learning Disorder and Diagnostic Methods in Primary School Children Aged 6-11)*. Istanbul: Taç Press.
- Kosc, L. (1974). Developmental dyscalculia. *Journal of Learning Disabilities*, 7(3), 164-177.
- Koroğlu, E. (2008). *DSM-IV-Diagnostic Criteria Reference Book*. Istanbul: HYB Publishing.
- Landerl, K., & Moll, K. (2010). Comorbidity of learning disorders: Prevalence and familial transmission. *Journal of Child Psychology and Psychiatry*, 51(3), 287-294.
- MEB. (2006). *Regulation on Special Education Services*. Ministry of National Education.
- Morsanyi, K., Bers, B., McCormack, T., & McGourty, J. (2018). The prevalence of specific learning disorder in mathematics and comorbidity with other developmental disorders in primary school age children. *British Journal of Psychology*, 109(4), 917-940.
- Mutlu, Y., Olkun, S., Akgün, L., & Sarı, H. M. (2020). *Dyscalculia Mathematics Learning Disability Definition, Characteristics, Prevalence, Causes and Diagnosis*. Ankara: Pegem Academy Publishing.
- Mutlu, Y. (2016). Mathematics learning disability (developmental dyscalculia). In E. Bingolbali, S. Arslan, & I. O. Zembat (Eds.), *Theories in Mathematics Education*. Pegem Academic Publishing.
- NJCLD (National Joint Committee on Learning Disabilities Definition of Learning Disabilities), (1990). Learning disabilities: Issues on definition. *Asha*, 33(5), 18-20.
- Saraç, S. (2014). Reading difficulties and dyslexia. *Psychology Studies*, 34(1), 71-77.
- Saravanabhavan, S., & Saravanabhavan, R. (2010). Knowledge of learning disability among pre-and in-service teachers in India. *International Journal of Special Education*, 25(3), 132-138.
- Sezer, S., & Akın, A. (2011). Teachers' opinions about Dyscalculia seen in the students between the ages of 6-14. *Elementary Education Online*, 10(2), 757-775.
- Şimşek, R. (2012). *Attention Deficit and Dyslexia*. Istanbul: Bere book.
- Şimşek, N., & Arslan, K. (2022). Descriptive analysis of studies on mathematics learning disabilities. *West Anatolia Journal of Educational Sciences*, 13(1), 433-449.
- Wadlington, E. M., & Wadlington, P. M. (2006). How dyslexia and dyscalculia affect educators and their students. *Annual Conference of the Association for Childhood Educational International*.
- Wadlington, E. M., Wadlington, P. L., & Rupp, D. E. (2006). Teachers with dyslexia and dyscalculia: Effects on life. *Academic Exchange Quarterly*, 10(3), 110-123.
- Yıldırım, A., & Şimşek, H. (2013). *Qualitative Research Methods in Social Sciences*. Ankara: Seçkin Publishing.

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