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Knowledge Needed for Teaching Students with Learning Disabilities in Mathematics: A Systematic Literature Review

Sarah Irdina Misri, **Roslinda Rosli***, **Khairul Farhah Khairuddin**
Universiti Kebangsaan Malaysia, Malaysia

Siti Muhibah Nor
Institut Pendidikan Guru Kampus Ilmu Khas

Fatimah Abdul Razak
Universiti Kebangsaan Malaysia, Malaysia

Low Hui Min
Universiti Sains Malaysia, Malaysia

Suzieelez Syrene Abdul Rahim
Universiti Malaya, Malaysia

Abstract. Knowledge and skills in mathematics are vital for helping individuals navigate various aspects of everyday life, from shopping to cooking. Nevertheless, teaching mathematics to students with disabilities is a complex task that requires teachers to employ diverse knowledge and skills to accommodate students' needs. Past research has demonstrated that most teacher education programs fail to provide future teachers with the necessary competencies to teach mathematics effectively. Thus, this systematic literature review was carried out to investigate the essential knowledge needed to teach students with learning disabilities in mathematics. Data was gathered from two leading databases, Scopus and Web of Science, which yielded 21 articles. Thematic analysis was used to identify and present recurring patterns and themes from the data. The findings suggest that students with mathematics learning disabilities should be instructed by teachers who possess strong mathematical knowledge, pedagogical content knowledge, knowledge of students, and special education knowledge in providing high-quality instruction. Teachers with solid knowledge of mathematics can facilitate successful learning using diverse instructional strategies, such as concrete–representation- abstract methods and number sense interventions, to help

*Corresponding author: Roslinda Rosli; *roslinda@ukm.edu.my*

students comprehend abstract concepts in mathematics. In addition, mathematics teachers should resolve issues and challenges they face and support and accommodate students' learning needs. The study provides guidelines for teacher educators to train future teachers and for researchers to improve the teaching of students with mathematics learning disabilities through evidence-based practices.

Keywords: dyscalculia; mathematics; teacher knowledge; systematic review; teacher preparation programs

1. Introduction

In school, students with learning disabilities (LD), especially those in special education settings, often face challenges with working memory, processing speed, and executive function, which can impede their engagement with instructional tasks. Students with LD in mathematics are also known as students with mathematics learning disabilities (MLD). These can take many forms, including difficulties with number sense, computation, and problem solving (Sheppard & Wieman, 2020). According to Dowker (2024), students who experience severe and persistent difficulties with mathematics may be described as dyscalculic, resulting from a lack of schooling, poor teaching, social disadvantage, or general learning difficulties.

In addition, students with MLD struggle to understand abstract mathematical concepts without effective instruction, as not many teachers have a profound knowledge of teaching mathematical content to students, including those with MLD (Nagro et al., 2023; Sheppard & Wieman, 2020). Similarly, Nagro et al. (2023) reported that most teachers are shocked by the transition into the profession because they feel underprepared to manage classrooms, especially students with MLD.

Research highlights the importance of teaching knowledge frameworks for effective instruction to accommodate the diverse learning needs of students (Piñeiro & Calle, 2023). For instance, Shulman (1987) described seven elements of professional knowledge for teachers: subject matter knowledge (SMK); pedagogical content knowledge; knowledge of learners and their characteristics; curriculum knowledge; general pedagogical knowledge; knowledge of educational contexts; and knowledge of educational ends, purposes, and values.

The work has become the basis for developing later frameworks studying teacher knowledge in mathematics, such as Ball et al. (2008). Ball's Mathematical Knowledge for Teaching (MKT) is a practice-based framework that extends Shulman's ideas of SMK and PCK into six interrelated domains of teacher knowledge for effective mathematics instruction. The MKT consists of common content knowledge, horizontal content knowledge, specialized content knowledge, knowledge of content and students, knowledge of content and teaching, and knowledge of content and curriculum (e.g., Ball et al., 2008; Hill et al., 2008).

Many researchers believe that a comprehensive understanding of teacher knowledge enhances educational results and fosters continuous growth and development in their classroom practices (Holmes, 2012; Nagro et al., 2023; Sheppard & Wieman, 2020). The reason for this is that teachers are recognized as a key component in students' academic success (Nagro et al., 2023). In this regard, teaching students with MLD presents considerable challenges that necessitate specialized knowledge and pedagogical expertise.

Teachers must not only know mathematical concepts but also be able to present the content in accessible ways to build a solid understanding of these concepts (Feng & Sass, 2013; National Council of Teachers of Mathematics & Council for Exceptional Children, 2024). Nonetheless, knowledge of content and pedagogy alone is insufficient for success as a teacher of students with MLD. Understanding the specific knowledge and skills teachers need for teaching mathematics is crucial for designing effective teacher preparation programs and professional development initiatives (Piñeiro & Calle, 2023).

Most of the existing reviews focus on interventions and strategies for students with MLD (e.g., Bone et al., 2021; Lafay et al., 2019; Monei & Pedro, 2017) or the effectiveness of diverse instructional methods (e.g., Gersten et al., 2009; Jitendra et al., 2018). There is limited emphasis on the specific knowledge and competencies teachers need to teach mathematics effectively to students with MLD. For instance, Rosli and Suib (2020) reviewed teachers' knowledge; however, their review was not a comprehensive systematic review and was limited in scope by the year of publication and the keywords used for the search.

On the other hand, the reviews by Nelson, Crawford et al. (2022), Nelson, Johnson et al. (2022), and Marita and Hord (2016) discussed the broader aspects of MLD but did not focus explicitly on the knowledge teachers require. Some reviews (e.g., Kroesbergen & Van Luit, 2003; Obudo, 2008) are older. A new systematic review would include more recent research and developments in the field, providing up-to-date insights and recommendations. Thus, this study's systematic literature review (SLR) attempts to complement the existing reviews by examining aspects of teacher knowledge. By synthesizing the findings from various studies, this review will provide a comprehensive overview of basic knowledge for teachers when dealing with students with MLD.

2. Methodology

The present SLR was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram 2020 for searching and evaluating suitable articles. Two databases were searched for empirical research on the knowledge needed for teaching mathematics to students with MLD: Scopus and Web of Science (WoS). These two leading databases have better quality control over the acceptance of published articles (Zhu & Liu, 2020). Since Scopus and WoS are leading databases of high-indexed journals, many duplicate records were removed (n = 50).

The inclusion and exclusion search criteria were set before the SLR began to help make consistent decisions during the selection process (Tod, 2019). The inclusion criteria included empirical research published within the last 14 years (2010–2023), as previous reviews had covered the earlier period, limited to articles published in English journals. It is worth mentioning that journal articles that studied teachers with experience in teaching mathematics to students with MLD in inclusive settings were also selected.

On the other hand, the exclusion criteria were articles that were not published in English journals and that were published before 2010. Furthermore, articles were excluded if their sample was students with mathematics learning difficulties or who were at-risk in mathematics. The selected articles included teacher perception studies and intervention studies exploring instructional strategies relevant to PCK.

The article selection process began in May 2024 using the PRISMA flowchart shown in Figure 1. The empirical articles were selected in three stages based on the PRISMA flowchart. In the first stage, articles were identified through a database search from Scopus and WoS (identification) using the search string *mathematics learning disability** queries. Then, the researchers screened the articles based on the criteria and reviewed them in depth to determine their eligibility.

Lastly, articles that fulfilled all the criteria were included in the analysis. For this SLR, 129 articles were found in Scopus, while 144 were identified through the WoS database. Nevertheless, after initial identification, the articles remaining for screening were 95. Upon checking the title, abstract, and keywords, 72 articles were removed because they did not focus on the knowledge needed for teaching mathematics to students with MLD.

Then, after using different keywords and backward searching (citation searching), the researchers extracted other articles that fulfilled the inclusion criteria. After the researchers thoroughly read each article, seven articles (n = 7) were removed because they were unrelated, were not empirical studies, and did not answer the research questions.

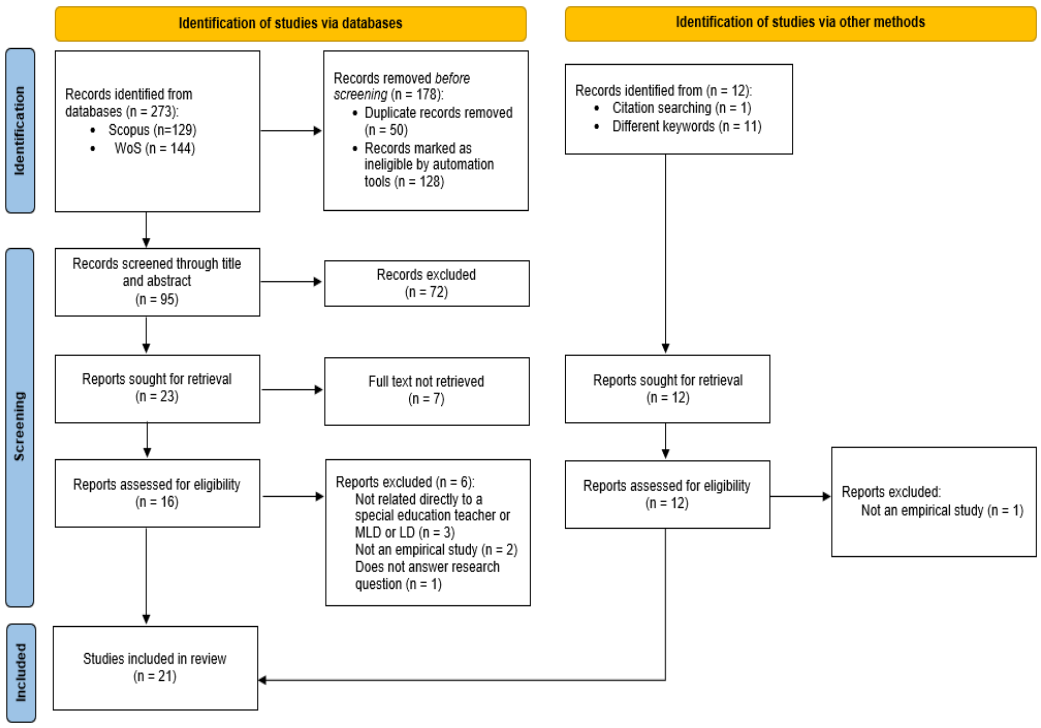

Figure 1: Identification of studies using the PRISMA flowchart

Overall, 21 articles were eligible for analysis in this SLR. Table 1 shows the title, author, year, journal, and focus of the study for each selected article. A quality assessment was performed on the articles in the final selection using rubric by Mullet et al. (2017). Based on the rubric, each selected article scored at least 16 points or 60%, indicating its strength in reporting the study details, aligning research questions with methodologies, maintaining sample sizes, displaying sufficient result data, and connecting the discussion of findings to past works. Studies with the highest quality also articulate a theoretical or conceptual framework that aligns with the study's purposes (Mainali, 2022; Satsangi et al., 2021). Then, thematic analysis was used, and data were synthesized using a narrative approach to integrate the findings.

Table 1: The list of empirical studies

No	Author(s) and year of publication	Focus of study
1	Alghazo & Alghazo (2020)	Examining the competencies of preservice and in-service special education teachers based on the national standards for teaching mathematics.
2	Almughyiri (2022)	Exploring the impact of professional development and certification of special education teachers on teaching mathematics.
3	Al-Salahat (2022)	Investigating the effect of the Concrete, Representational (Pictorial), Abstract model of teaching on students' understanding of perimeter.

No	Author(s) and year of publication	Focus of study
4	DeJarnette & Hord (2022)	Focusing on questioning practices that have been learned and adopted by special education preservice teachers in teaching mathematics.
5	Dennis et al. (2016)	Using several sense and extensive practice interventions to assist special education students in solving basic facts.
6	Ekstam et al. (2017)	Investigating mathematics and special education teachers' efficacy, subject and pedagogical knowledge in teaching low-achieving students.
7	Faramarzi & Sadri (2014)	Examining the effect of neuropsychological interventions on female students with dyscalculia.
8	Feng & Sass (2013)	Finding a relationship between students with disabilities' academic performance and teachers' factors, such as professional development, formal university education and on-the-job experience.
9	Göransson et al. (2016)	Investigating the implementation of a conceptually based mathematics curriculum for students with intellectual disabilities.
10	Hughes (2019)	Extending video-based instruction for teaching mathematics to students with mathematics learning disabilities.
11	Hunt et al. (2014)	Understanding the impact of supplemental instruction (ratio equivalence) on students with mathematics learning disabilities.
12	Hunt et al. (2022)	Determining preservice teachers' anticipation of students' diverse mathematical thinking while problem solving.
13	Mainali (2022)	Investigating two preservice elementary teachers' (one with mathematics learning disabilities) beliefs toward mathematics, learning mathematics, and teaching mathematics.
14	Massey & Muhammad (2024)	Exploring preservice teachers' experience taking a course on teaching mathematics to special education students.
15	Piñeiro & Calle (2023)	Describing the knowledge for teaching mathematics through courses offered to preserve special education teachers.
16	Satsangi et al. (2020)	Comparing video modeling strategy and teacher-led modeling in teaching algebraic skills of graphing linear equations to students with mathematics learning disabilities.
17	Satsangi et al. (2021)	Expanding the use of the video modeling strategy for teaching Algebra 1.
18	Sheppard & Wieman (2020)	Identifying the knowledge needed for future mathematics teachers to teach special education students.
19	Shin & Bryant (2017)	Investigating the impacts of Fun Fraction on students with mathematics learning disabilities in solving fraction word problems.

No	Author(s) and year of publication	Focus of study
20	van Garderen et al. (2018)	Examining special education teachers' knowledge, instructional practices, and perceptions about the use of virtual realities in teaching mathematics.

3. Findings

Twenty-one publications were included in the final data collection stage, as illustrated in Table 1, which provides important information regarding each publication. Various participants were involved, including preservice and in-service special education teachers and general education teachers who teach students with MLD in inclusive classrooms. Most of the research was conducted in the USA (n = 14), with small numbers in Saudi Arabia, Iran, the Middle East, Chile, Finland, and Sweden. Eleven studies (n = 11) used a quantitative research approach; six studies focused on qualitative methods (n = 6), and four studies used mixed methods (n = 4).

The thematic analysis produced four main themes, and eight subthemes related to the knowledge needed to teach mathematics to students with MLD. Specifically, the main themes were special education knowledge, mathematical knowledge, knowledge of students, and pedagogical content knowledge. The eight subthemes under PCK were prompting techniques, the concrete–representation–abstract method, questioning strategies, number sense intervention, cognitive recognition, instructional variety, learning aids, and skills training.

3.1 Main theme 1: Special Education Knowledge

Of the 21 articles, four studies implicitly mentioned the importance of special education knowledge when teaching students with MLD. Special education knowledge is essential when teaching mathematics to students with MLD since it allows the teacher to understand the student's unique needs and prepare ways to accommodate them (Massey & Muhammad, 2024; Sheppard & Wieman, 2020).

Despite this, the mathematics methods syllabi in university teacher preparation programs neglect special education knowledge for teaching mathematics to students with MLD (Massey & Muhammad, 2024; Piñeiro & Calle, 2023). Instead of developing the skills required to diagnose learning difficulties in mathematics and implement interventions, programs in special education knowledge for teachers tend to prioritize content knowledge, procedural skills, pedagogical content knowledge, and specific mathematical topics.

Another aspect that illustrates the arguments about teaching mathematics to students with MLD is that teachers' educators have different perspectives on the importance of special education knowledge (Sheppard & Wieman, 2020). For instance, educators of special education teachers emphasize the importance of special education knowledge in understanding the specific challenges of students with MLD, but mathematics education educators do not (Sheppard & Wieman, 2020). This conflict of interest should be taken seriously by teacher education

programs. Along the same lines, Feng and Sass (2013) and Ekstam et al. (2017) found that teacher training in special education positively influences the mathematics achievement of students with MLD and teachers' efficacy beliefs compared to general education training. In short, this portrays how researchers' theories and views do not align with the practical world of special education teacher preparation programs.

3.2 Main theme 2: Mathematical Knowledge

A deep understanding of mathematics assists individuals in making the right decisions and solving practical life problems. Many researchers suggest that teachers should have a profound understanding of the various mathematical content and be adept at addressing a wide range of topics (Massey & Muhammad, 2024; Piñeiro & Calle, 2023). In addition, Alghazo and Alghazo (2020) state that special education teachers should be well-versed in broad and specific curricular requirements. They also recommend that special education programs consider National Council of Teachers of Mathematics standards when preparing teachers to work with students with MLD.

In addition, special education teachers must have a strong foundation in mathematics content knowledge to make complex ideas in the mathematics curriculum accessible to students with MLD (Piñeiro & Calle, 2023; Sheppard & Wieman, 2020). The reason is that content knowledge is essential in facilitating teachers' pedagogical content knowledge (Agathangelou & Charalambous, 2021). During teacher preparation programs, mathematical knowledge is essential in methods courses for special education teachers in Chilean and southeastern United States universities (Massey & Muhammad, 2024; Piñeiro & Calle, 2023).

In addition, one study showed that teachers who taught both mathematics methods that included special education and special education methods that included mathematics pointed out the importance of deep mathematical knowledge (Sheppard & Wieman, 2020). In Finland, Ekstam et al. (2017) argue that in Swedish-speaking schools, many special education teachers perceive their mathematical knowledge as adequate but not as strong as mathematics teachers.

In another study, Sheppard and Wieman (2020) showed that mathematics teachers' educators, unlike special education educators, believed that deep mathematical knowledge is the most essential knowledge; they suggest that these two groups should collaborate to teach mathematics together. Sharing experience in problem solving is intended to bridge the gap between special education and mathematics education by helping special educators see the value that mathematics educators place on a deep, conceptual understanding of mathematics.

Nevertheless, Massey and Muhammad (2024) found that special education teachers' confidence in teaching mathematics grows with increased pedagogical content knowledge. Similarly, Piñeiro and Calle (2023) infer that the role of mathematics knowledge in the special education syllabus is not often discussed as compared to special education knowledge. These studies show that good

teachers should have strong mathematics knowledge to offer meaningful classroom instruction to students with MLD (Alghazo & Alghazo, 2020; Ekstam et al., 2017).

3.3 Main theme 3: Knowledge of Students

Teachers who teach mathematics to students with MLD must recognize their students' unique needs; this is mentioned in four articles: Alghazo and Alghazo (2020), Göransson et al. (2016), Massey and Muhammad (2024), and Sheppard and Wieman (2020). Many researchers believe that knowledge of one's students is essential when teaching mathematics to students with MLD to understand how they learn, how they make sense of mathematics, and how they perceive mathematical content (Alghazo & Alghazo, 2020; Göransson et al., 2016; Massey & Muhammad, 2024; Sheppard & Wieman, 2020).

Moreover, Massey and Muhammad (2024) suggest that special education teachers must know the progression of mathematics skills development for their students and address their individual needs to close the mathematics performance differences between students with MLD and their peers. In addition, multidisciplinary and interdisciplinary teachers' educators rank knowledge about individual students as the most important aspect of teacher knowledge for teaching mathematics to students with MLD (Sheppard & Wieman, 2020). For this reason, the job of special education teachers is to identify these students' conditions and develop specific techniques to enable each student to gain access to mathematics knowledge (Sheppard & Wieman, 2020). Teachers should consider how students with MLD perceive and understand the abstract concepts of mathematics.

3.4 Main theme 4: Pedagogical Content Knowledge

Teachers with pedagogical content knowledge can make mathematical content comprehensible to students, including special education students (Carrillo-Yañez et al., 2018). This is why Göransson et al. (2016) identified pedagogical mathematics activities as one of the three major groups of teaching strategies. Special education teachers need pedagogical knowledge to make mathematical concepts understandable to students with MLD, including introducing and teaching them (Ekstam et al., 2017). This theme produced the eight subthemes listed above: prompting techniques, the concrete–representation–abstract method, questioning strategies, number sense intervention, cognitive recognition, instructional variety, learning aids, and skills training.

3.4.1 Subtheme 1: Prompting techniques

Regarding modeling through prompts, Satsangi et al. (2020) found that teacher-led modeling can significantly enhance students with MLD's mathematical performance, particularly when solving algebra problems. Concerning visual prompts, Van Garderen et al. (2021) and Shin and Bryant (2017) emphasize the importance of virtual reality (VR) in improving PCK and enhancing learning experiences for students with MLD. This resonates with the findings of Satsangi et al. (2021) and Hughes (2019), who highlighted the potential of video-based

learning (i.e., VBI and VR) as an effective tool for teaching students with MLD, particularly when this is paired with a system of prompting.

3.4.2 Subtheme 2: Concrete–representation–abstract method

Hunt et al. (2014) suggest using concrete, pictorial, and abstract representations to improve students with MLD's mathematics, particularly in algebra, when dealing with such things as ratios and proportional reasoning. Al-Salahat (2022) highlights that sequential CRA instruction teaches mathematics effectively to students with MLD. Hughes (2019) also discusses the role of explicit video-based instruction in demonstrating CRA. The combination of explicit video-based instruction and VR helped students with MLD to simplify fractions; however, after the intervention, they still struggled with complex tasks like solving word problems. For this reason, Van Garderen et al. (2018) highlights the importance of ongoing explicit instruction in VR.

3.4.3 Subtheme 3: Questioning strategies

Hunt et al. (2022) found that special education teachers modify their teaching strategies by splitting up questions after understanding the diverse ways in which students think. For that reason, DeJarnette and Hord (2022) encourage teachers to ask probing questions and adjust their questioning techniques based on the students' responses. Using more straightforward questions or giving feedback to support learning makes students more likely to engage in deeper learning.

3.4.4 Subtheme 4: Number sense intervention

Dennis et al. (2016) showed that an intervention had different effects on strategy transformation, fact retrieval and generalization for students with MLD. Specifically, students' predominant strategies changed when solving fundamental fact problems, and they started to use more efficient counting procedures, such as counting up for subtraction facts. In addition, extensive practice during the intervention also significantly improved their retrieval performance but did not facilitate the development of their solving strategies. Dennis et al. (2016) suggest that the combination of number sense and extensive practice interventions can benefit students with MLD in learning concepts of numbers and operations.

3.4.5 Subtheme 5: Cognitive recognition

Three critical cognitive recognition approaches are student-centered adaptation (Feng & Sass, 2013; Hunt et al., 2014), diverse thinking recognition (Hunt et al., 2022), and cognitive diversity accommodation (Feng & Sass, 2013). Student-centered adaptation involves individualized learning approaches that improve the mathematical skills of students with MLD (Feng & Sass, 2013; Hunt et al., 2014). Regarding diverse thinking recognition, Hunt et al. (2022) state that teachers tend to modify their instruction strategies after understanding the diverse ways in which students think. This includes changing the type of problem, removing extraneous information, removing all context, changing the number order, and reducing complexity.

Furthermore, Feng and Sass (2013) highlight that differentiated instruction, accommodation, and modifications are frequently critical components of effective teaching practices that accommodate cognitive diversity. A balanced combination of these methods is crucial for classroom equity and for helping students thrive.

3.4.6 Subtheme 6: Instructional variety

As highlighted by Almughyiri (2022), instructional variety is crucial; half of the trained special education mathematics teachers in Saudi Arabia use multiple instructional methods. Mainali (2022) also emphasizes the positive impact of appropriate strategies on students' attitudes toward mathematics. Accordingly, the subjects provided by special education teacher programs stress the diversification of mathematics teaching strategies (Piñeiro & Calle, 2023). Explicit instruction is also essential, with over a quarter of the teachers in Saudi Arabia adopting it, particularly in visual representations (Almughyiri, 2022; Van Garderen et al., 2018).

In addition, instructional trajectories involving planned instructional paths improve performance in specific areas, such as ratio equivalency, for students with MLD (Hunt et al., 2014). Therefore, a balanced approach to instruction is essential, combining various strategies to enhance mathematics skills in students with MLD (Hunt et al., 2014).

3.4.7 Subtheme 7: Learning aids

Learning tools and strategies are critical for effective teaching, as highlighted by Massey and Muhammad (2024), who found that special education teachers came to recognize their importance after completing a Math Methods course. Video-assisted learning also plays a significant role. Hughes (2019) showed that point-of-view video modeling, including virtual demonstrations of concrete mathematical manipulation, effectively helps students with MLD simplify fractions. Satsangi et al. (2021) further support the use of video modeling as a complementary source in enhancing mathematics instructional practices for students with MLD.

3.4.8 Subtheme 8: Skills training

Hunt et al. (2014) highlights that strategy training is an effective method, involving teaching specific strategies to improve mathematical skills in students with MLD. In addition**,** neuropsychological training is beneficial. Faramarzi and Sadri (2014) found that reinforcing cognitive functions, such as attention, executive planning, working memory, language, and visuospatial processing, significantly boosts mathematical performance in elementary students with MLD.

4. Discussion

Existing literature indicates that effective mathematics instruction for students with MLD emphasizes the significance of teacher knowledge tailored to meet these students' unique learning needs. The interplay of Shulman's (1987) and Ball et al.'s (2008) MKT highlights the necessity for teachers to possess various knowledge domains that they must cultivate to effectively deliver mathematics content, especially for students facing learning challenges, including special

education knowledge, mathematical knowledge, knowledge of students, and pedagogical content knowledge.

Past research underscores the necessity for teachers to have a robust understanding of students with MLD to adapt their teaching methodologies to facilitate better learning outcomes (Agathangelou & Charalambous, 2021). The need for specialized knowledge becomes more pressing when considering the varying forms students with MLD could take within a specific time frame. Specifically, students with MLD are unique; teachers must be well-versed in diverse instructional strategies, and special education training significantly enhances student achievement in mathematics and teachers' self-efficacy (Ekstam et al., 2017; Feng & Sass, 2013). The contrast between general education training and special education preparation demonstrates a critical gap that must be addressed within teacher education programs (Massey & Muhammad, 2024; Sheppard & Wieman, 2020).

Considering these findings, educational institutions need to integrate comprehensive training focused on the mathematical instructional needs of students with MLD (Massey & Muhammad, 2024). A greater emphasis on understanding the ways students with MLD learn, including the use of CRA methods, has emerged as a key strategy for enhancing instruction in algebraic contexts and building foundational mathematical concepts (Al-Salahat, 2022; Garderen et al., 2018; Hughes, 2019; Hunt et al., 2014).

Understanding the cognitive processes of students with MLD would help teachers manage their teaching. For instance, cognitive diversity among students with MLD in classrooms requires teachers to recognize and accommodate diverse thinking patterns and cognitive abilities, fostering a more inclusive environment through differentiated instruction, accommodations and modifications of teaching strategies (Feng & Sass, 2013; Hunt et al., 2022). These approaches need to be practiced so that students with MLD can understand and acquire mathematical knowledge through the stimuli they have experienced.

5. Limitations

This study has a few limitations. First, this SLR only focused on articles published between 2010 and 2023. It is indisputable that many more appropriate articles have been published that meet the comprehensive standards outlined in this SLR but could not be chosen because of the constraints of the publication dates. Extended periods may be used in future studies to extract more relevant data about the fundamental concepts needed to teach mathematics to students with learning difficulties. Second, the articles in this SLR were found in Scopus and WoS databases; a few articles relevant to this research were likely overlooked. Nevertheless, all possible articles were scanned using reference tracing to limit the chance of missing articles.

6. Conclusion

The review highlighted key areas in which teachers need support and training, such as understanding MLD and implementing differentiated instruction. The

findings underscore the importance of comprehensive training for educators, incorporating the needed knowledge and various best practices. Teachers in inclusive classrooms must embrace diverse teaching methods and recognize the unique needs of students with MLD. This can significantly improve the learning outcomes in mathematics for students with MLD. The need for ongoing research and the practical application of these findings are essential to continue improving educational practices and supporting students with MLD in their mathematical development.

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