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'I don't let him try on his own': Parental involvement in children's mathematics learning with and without learning difficulties

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Abstract: Parental involvement in their children's mathematics homework is widely recognized as a crucial factor shaping both achievement and learning experiences. This qualitative study explores how parents support mathematics learning at home, focusing on families with children with and without learning difficulties in the early years of primary school in Greece. The study defines learning difficulties as persistent challenges in learning and achievement, with or without formal diagnosis, as reported by teachers and parents. Data were collected through semi-structured interviews and field observations to ensure triangulation of parental perceptions and actual practices. The findings show different patterns of parental involvement: parents of children with learning difficulties often took on directive, intensive scaffolding and close supervision, while parents of typically developing children demonstrated a more autonomy-supportive, balanced involvement, fostering independent problem-solving. The study underscores the importance of family-school collaboration, highlights the need for culturally responsive parental guidance, and calls for future research on broader family constellations and post-pandemic dynamics in parental involvement.

Keywords: Parental involvement, Mathematics homework, Learning difficulties, Autonomy support, Family-school collaboration

Introduction

Parental involvement in their children's education is widely acknowledged as a critical factor influencing students' academic achievement and emotional well-being (Fan & Chen, 2001; Hill & Tyson, 2009; Wang & Wei, 2024; Wu et al., 2022). In the domain of mathematics learning, home-based support −especially during homework− has been found to play a key role in shaping students' attitudes, motivation, and performance (Hoover-Dempsey et al., 2001; Cai et al., 2002). However, the nature and intensity of parental involvement are not uniform and may vary across families depending on parental beliefs, resources, and, critically, the learning profiles of children.

In this study, we adopt the term learning difficulties to describe persistent barriers to learning that impede children's academic progress, regardless of whether a formal diagnosis exists. This usage reflects the current framework in which learning difficulties are seen as context-dependent, shaped not only by cognitive profiles but also by classroom practices and family experiences (Civil & Bernier, 2006; Gaspar & Sahay, 2025). Understanding learning difficulties in this comprehensive and context-dependent way is particularly important for

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the study of parental involvement. Families often navigate these challenges without formal diagnoses, relying instead on their own observations, teachers' feedback, and daily experiences at home. However, research has rarely examined how parents themselves interpret and respond to such difficulties in authentic homework situations. Most existing studies emphasize parental support in general terms, without sufficient consideration of how learning difficulties − diagnosed or otherwise − shape parental practices (Falanga & Gonida, 2022). By focusing on both children with formal diagnoses and those with evident but undocumented challenges, this study responds to the need for more nuanced, culturally situated research on parental involvement in mathematics learning.

Mathematics represents a particularly rich and complex context for exploring these dynamics. It is often associated with parental and student anxiety, high performance expectations, and tensions around perceived difficulty (Maloney et al., 2015). Recent studies have highlighted how parental beliefs about mathematics −such as whether ability is seen as fixed or malleable− influence the degree to which parents encourage persistence and constructive struggle (Boaler, 2016). Moreover, pandemic-era research has shown that the shift toward home-based learning has magnified disparities in parental capacity to provide effective support, making the issue of equitable involvement even more pressing (Wang & Wei, 2024).

Despite a growing body of research evidence, important gaps remain. First, few studies combine direct observations of homework practices with parents' self-reported perceptions, leaving unanswered questions about potential discrepancies between what parents say and what they actually do. Second, relatively little attention has been given to the experiences of families of children with learning difficulties, especially in comparative designs that also include typically developing peers. Finally, there is a lack of culturally responsive research that situates parental involvement within everyday routines and the sociocultural fabric of family life (Civil & Bernier, 2006). Addressing these issues is crucial not only for advancing research but also for informing educators and policymakers about how to better support families in diverse learning contexts.

The present study addresses these gaps through an in-depth qualitative case study of families in Greece, examining parental strategies, perceptions, and interactions during mathematics homework. It is guided by two research questions:

- How are parents involved in the mathematics homework of children with and without learning difficulties?
- What are parents' perceptions about their involvement in children's mathematics homework?

By situating parental practices within real-life home environments and drawing on rich qualitative data, this study aims to provide deeper insight into how support is enacted and rationalized, especially in households facing diverse educational challenges.

Literature review

Parental involvement in homework

It has long been recognised that parental involvement in children's homework makes an important contribution to academic performance, motivation and emotional adjustment. However, this involvement is not a singular or uniform concept. Rather, it consists of various forms and degrees of participation, ranging from establishing homework routines and monitoring completion to directly helping with academic content (Hernández-Padilla et al., 2023; Wang & Wei, 2024; Wu et al., 2022). The nature of this involvement is often shaped by parents' beliefs about education, their own experiences with school, their sense of self-efficacy in supporting their child's learning, and the child's individual needs (Walker et al., 2005).

Several theoretical models have been developed to conceptualize parental involvement. One of the most influential is the model by Hoover-Dempsey and Sandler (1997), which highlights motivational beliefs, invitations to involvement (from school or child), and perceived life context as major predictors of parents' decisions to become involved. Epstein's framework (2011) also identifies six types of involvement (parenting, communicating, volunteering, learning at home, decision-making, collaborating with community), emphasizing the dynamic interaction between family and school responsibilities. In the context of these models, homework is often viewed as a 'shared responsibility', yet one that unfolds differently across households.

Importantly, the quality and impact of parental involvement are not always easy to assess. While supportive engagement can promote student confidence and achievement, excessive control or conflictual interactions during homework time may undermine autonomy and increase anxiety (Patall et al., 2008; Pomerantz et al., 2007). In this sense, involvement must be understood not just in terms of quantity, but also in terms of style and relationship dynamics.

As research increasingly moves beyond simple categorizations of involvement (e.g., help vs. no help), researchers emphasize the need to consider contextual and child-specific factors. These include the age of the student, the subject matter, and the sociocultural environment of the family. Homework is, therefore, both a pedagogical and a relational issue, where parents navigate educational, emotional, and identity-based roles within the intimacy of the home (Lehner-Mear & Coll, 2024).

The context of mathematics homework

Research consistently demonstrates that family involvement plays a crucial role in student achievement, especially in mathematics (Hernández-Padilla et al., 2023; Wang & Wei, 2024). Parental involvement in mathematics manifests in two primary forms: indirect involvement, which includes parental expectations, encouragement, and

attitudes toward mathematics, and direct involvement, which includes interactions in homework and family mathematical activities (Moutsios-Rentzos et al., 2015). Importantly, this involvement is deeply embedded in the sociocultural context of family and school. A study by Moutsios-Rentzos et al. (2015) in Greece highlights how the socio-cultural identity of the school and perceived parental involvement shape the nature and meaning of parental support in mathematics learning, pointing to the significant role of cultural norms and community expectations in shaping parents' attitudes and behaviors towards mathematics homework.

Mathematics homework represents a distinct and often emotionally charged domain of parental involvement. Unlike other school subjects, mathematics is frequently associated with anxiety, frustration, and negative self-perceptions − not only among students but also among their parents (Maloney et al., 2015). Many parents report feeling ill-equipped to assist with math assignments, especially when the instructional methods differ from those they were taught in school. As a result, mathematics homework often becomes a site of tension, negotiation, or even avoidance within the home (Civil & Bernier, 2006).

Research indicates that parental beliefs about mathematics −such as its perceived difficulty, importance, and whether ability in math is seen as fixed or malleable− significantly influence how parents engage with their child's math learning (Boaler, 2016). For instance, parents who hold fixed beliefs about mathematical ability may be less likely to encourage persistence or constructive struggle during homework. In contrast, those who emphasize effort and growth may foster more positive learning experiences.

Moreover, mathematics is often treated by both parents and educators as a high-stakes subject, linked closely with academic success and future opportunities. This perception can increase pressure around homework completion and foster more directive or performance-driven parental behaviors. Such dynamics may contribute to heightened math anxiety and a reduction in children's autonomy and intrinsic enjoyment of learning (Maloney et al., 2015; Pomerantz et al., 2007).

The home environment makes things even more complicated. Unlike in the classroom, where instruction is structured and led by professionals, home support in math is often improvised and emotionally colored. Parents may reconcile to balance the roles of teacher, motivator, and caregiver − particularly when the child expresses frustration or disengagement. These dynamics are not only influenced by parents' math proficiency, but also by the quality of the parent-child relationship and the broader family context (Wu et al., 2022).

To summarise, mathematics homework offers a unique terrain for the study of parental involvement. It intersects with perceptions, emotions, instructional styles, and family dynamics − making it an ideal lens through which to explore how learning is supported (or strained) within the home.

Parental support for children with learning difficulties

Parental involvement in the homework of children with learning difficulties presents a set of unique challenges, demands, and emotional dynamics. Children with learning difficulties −whether in attention, memory, processing speed, or specific domains like dyscalculia− often require more structured, sustained, and individualized support during homework tasks (Green et al., 2007). This need for greater scaffolding can significantly shape the nature of parental engagement, making it more intensive, directive, or emotionally charged compared to involvement with typically developing peers.

Studies have shown that parents of children with learning difficulties tend to adopt more hands-on approaches, closely supervising tasks or even completing portions of the work to avoid emotional distress or task failure (Silinskas & Kikas, 2017). While these strategies often emerge from a place of care and protection, they may inadvertently undermine the child's autonomy and self-efficacy. Moreover, the cumulative frustration that can arise from repeated struggles with homework may place strain on the parent-child relationship, creating cycles of tension, avoidance, or learned helplessness.

These contexts often require parents to provide not just instructional support but also emotional presence and sensitivity. In particular, parents must not only navigate the academic content, but also provide ongoing encouragement, manage stress, and buffer their children's frustration or discouragement. Research suggests that these parents often experience higher levels of stress and uncertainty regarding how best to help, particularly in the absence of external support from educators or specialists (Cheng & Lai, 2023). In such cases, involvement may be characterised by ambivalence − a strong desire to help, tempered by doubts about their own effectiveness.

In contrast to deficit-based narratives, some studies highlight the resourcefulness and adaptive strategies that families develop to support children with learning difficulties. These may include breaking tasks into smaller steps, incorporating everyday materials to teach concepts, or prioritizing emotional safety over task completion. Importantly, these strategies are often grounded in intimate knowledge of the child's needs, rhythms, and sensitivities − a form of 'funds of knowledge' that is typically overlooked in formal education (Moll et al., 2009).

Overall, parental involvement in the homework of children with learning difficulties is not just a matter of effort or availability. It is shaped by a complex web of perceptions, emotions, experiences, and adaptive responses. Understanding these practices from within the home −rather than from the lens of compliance or school expectations− is essential to creating more empathetic and supportive educational frameworks.

How parents make sense of their involvement

Parental beliefs about education continue to shape both the quantity and quality of their involvement, influencing how support is provided and negotiated in daily practices (Lehner-Mear & Colla, 2024; Wu et al., 2022). Interviews revealed that parents of children with learning difficulties often perceive their role as essential but also emotionally and cognitively demanding, expressing both a deep sense of responsibility and occasional feelings of inadequacy (Green et al., 2007; Hornby & Lafaele, 2011). Some try to 'fill in' for the school, while others feel unprepared − particularly in mathematics, where many report anxiety or lack of content knowledge (Maloney et al., 2015).

Parents of typically developing children, on the other hand, tend to prioritize autonomy. This is consistent with findings that autonomy-supportive practices are more common when children are considered as academically capable (Hill & Tyson, 2009; Pomerantz et al., 2007). Meanwhile, parents of children with learning difficulties often take on a 'mediator' role − translating instructions, breaking down tasks, or managing emotions (Hayes, 2011; Goodall & Montgomery, 2014).

Cultural values and previous school experiences also colored parental interpretations of their role. For some, educational support was linked to the pursuit of academic success and social mobility, while for others, maintaining emotional balance and relationship harmony during homework time was a higher priority. These priorities often changed depending on the child's needs, family stressors, or previous encounters with the education system (Hill & Tyson, 2009). A Greek case study also shed light on how parents' discourse, emotional attitudes, and interactions around mathematics homework contributed to shaping their children's mathematical identities, highlighting the deep connection between cultural context, affect, and educational roles (Kafoussi et al., 2020).

Parental involvement is not merely behavioral but deeply embedded in a web of beliefs, expectations, and identity. Recent scholarship highlights that parents' sense of themselves as educators, supporters, and emotional anchors shapes how they enact homework support (Gaspar & Sahay, 2025; Lehner-Mear & Colla, 2024).

Observing homework practices at home

Despite the well-documented importance of parental involvement in children's learning, relatively few studies have directly investigated how this involvement unfolds during homework in the home environment − particularly in relation to mathematics and in families with diverse learning profiles. The available research suggests considerable variability in parental practices, with both the form and function of support being shaped by the child's learning needs, parental beliefs, and contextual constraints. Empirical studies with direct observation of homework interactions have shown that parents of children with learning difficulties tend to adopt more scaffolding, directive, and persistent support strategies (Patall et al., 2008; Silinskas et al., 2012). These strategies often include modelling problem-solving steps, offering verbal prompts, and monitoring emotional states throughout the task. For example, Cooper et al. (2000) found that parents of struggling learners were more likely to sit alongside their child for extended periods, guiding the process closely and intervening frequently.

In contrast, parents of typically developing children tend to exhibit more autonomy-supportive behaviors, such as encouraging independent thinking, asking open-ended questions, and withdrawing when the child shows competence (Patall et al., 2008). These differences are consistent with the broader findings of motivational research linking autonomy support with increased engagement and intrinsic motivation (Kallia & Dermitzaki, 2017).

The content domain of mathematics appears to reinforce this dynamic. Research has shown that math homework situations often trigger stress, uncertainty, or avoidance in both parents and children, particularly when parents lack confidence in their own mathematical ability (Maloney et al., 2015; Civil & Bernier, 2006). As a result, interactions can influence between over-scaffolding and emotional withdrawal, depending on the difficulty of the task and the parent's perceived competence.

Several studies have also emphasized the situational nature of parental support. For example, Stevens et al. (2006) conducted an ethnographic study illustrating how support styles are embedded in everyday family routines, spatial contexts (e.g., kitchen table vs. bedroom), and social norms around learning. Similarly, Civil (2009) emphasized the importance of the family 'mathematics funds of knowledge' − culturally embedded practices and informal numeracies that determine how math is supported at home. Recent qualitative research in Greece has highlighted the nuanced ways in which parental support for mathematics homework is embedded in family routines, emotional dynamics, and cultural expectations, underscoring the complex, situated nature of involvement (Falanga & Gonida, 2022).

In sum, the literature suggests that observed parental practices during mathematics homework are deeply contextual, varied, and mediated by both structural and relational factors. However, studies combining naturalistic observation with in-depth qualitative data remain scarce, especially those that include comparative perspectives between families of children with and without learning difficulties − a gap that the present study seeks to address.

Methodology

Research design

This study adopted a qualitative multiple case study design to investigate the nature of parental involvement in children's mathematics homework, focusing on both

children with and without learning difficulties. The case study approach was chosen because it enables in-depth examination of complex practices within their natural home settings (Yin, 2014). Based on an interpretivist paradigm, the research aimed to capture the subjective meanings and practices of parents in supporting their children's mathematics learning. Data collection combined semi-structured interviews with non-participant observations, which provided opportunities for triangulation and enabled a holistic perspective on parental perceptions and practices were enacted during homework interactions.

The inclusion of children with and without learning difficulties was intended to reveal possible variations in parental practices between different learning profiles. Considering these cases side by side allowed the study to explore whether and how strategies might range from directive to autonomy-supportive, as well as to identify concerns that could be common across families. At the same time, it is acknowledged that the contexts of children with learning difficulties and their typically developing peers are not fully comparable. The analysis therefore does not aim to establish direct equivalences, but rather provides illustrative contrasts that shed light on the flexible and adaptive nature of parental involvement in diverse home learning situations.

Participants

Four Greek first-graders and their mothers, who were the main homework supervisors in their household, took part in the study. The participants were purposefully selected to reflect diverse learning profiles. Two children/tweens −Christos (7 years old) and Jason (7 years old)− were typically developing with no diagnosed learning difficulties. Two others presented evident challenges: Panagiotis (8 years old), diagnosed with Autism Spectrum Disorder (ASD), and George (7 years old), who exhibited persistent learning difficulties (trouble with phonological awareness, reading and writing difficulties, concentration problems) but had no formal diagnosis.

The mothers were selected because they were the family members most consistently responsible for homework support. More specifically, the study included: Mother A − mother of Christos and Jason, Mother B − mother of Panagiotis, Mother C − mother of George. While this decision reflected the practical realities of caregiving in the participating families, it also limits the generalizability of findings. Their involvement was central to the study, as it focused on their strategies and perceptions regarding their role in their children's mathematics learning at home.

To contextualize the findings, demographic data were collected. All three mothers were fluent Greek speakers and had completed at least higher education. Families were of similar socioeconomic status belonging to middle-income households, while mother C was a single mother. All children attended mainstream public primary schools. These contextual details are essential, as parental education and socioeconomic resources can shape how families perceive and enact their role in supporting children's mathematics learning.

Data collection

Two primary methods of data collection were employed in this study: semi-structured interviews and direct non-participant observation. These complementary qualitative methods were selected to capture both the articulated perceptions of parents and the observed practices of parental involvement in mathematics homework in the home setting.

Direct non-participant observations were conducted during regular homework sessions at home over four months. Each family was observed in their natural setting while the mother completed a mathematics homework task with her child or children. The researcher did not intervene in the process, but took detailed field notes on verbal interactions, emotional reactions, types of assistance offered and the overall dynamics of the session. These observations aimed to capture authentic patterns of interaction and support strategies that may or may not match the parents' perceptions.

Semi-structured interviews were conducted with each mother individually. The interviews aimed to explore their perceptions and self-reported strategies regarding their involvement in their children's mathematics learning. The interview guide included open-ended questions focused on the nature, frequency, and goals of their involvement, their attitudes toward mathematics, and their views on their children's strengths and challenges in the subject. Some questions were also designed to clarify or elaborate on specific practices that had been observed during the home visits. The interviews lasted approximately 30-45 minutes and were audio-recorded with the consent of the participants.

By combining observational and interview data, the study sought to triangulate the findings and provide a more comprehensive understanding of the complexity of parental involvement in mathematics learning, especially in cases of learning difficulties.

Data analysis

The data from the semi-structured interviews and observations were analyzed using thematic analysis (Braun & Clarke, 2012). All interviews were transcribed verbatim and reviewed together with the field notes from the observations. The analysis followed a six-phase process: (1) familiarization with the data, (2) generation of initial codes, (3) search for themes, (4) review of themes, (5) definition and naming of themes, and (6) preparation of the final report. Both deductive and inductive coding strategies were applied. Initial coding was based on the existing literature on parental involvement and mathematics learning, but was open to emergent themes that reflected

the unique experiences and perceptions of individual participants. The observational data were coded according to the types of parental involvement (e.g., directive, supportive, passive), emotional tone, and task completion strategies. helped ensure the credibility and depth of the findings. By integrating observational and interview data, the study enabled cross-verification of findings. For instance, parents' reports of fostering independence were compared against observed practices of direct guidance, highlighting discrepancies between beliefs and behaviors.

Ethical considerations

This study was conducted in accordance with ethical standards for research involving human participants. Participation was entirely voluntary, and all participants (mothers) provided informed consent after being fully briefed on the study's purpose, procedures, and their rights, including the right to withdraw at any time without penalty. Confidentiality and anonymity were strictly maintained; pseudonyms were used for all children and parents, and any identifying details were omitted from reports. The study also ensured minimal disruption to family routines during observations and respected the emotional comfort of both children and parents throughout the research process. The researcher's non-participant role during observations was carefully preserved to avoid influencing natural interactions. Overall, ethical considerations prioritized respect, transparency, and protecting the wellbeing of all participants.

Findings

The analysis of data collected through non-participant observation and semi-structured interviews resulted in the following thematic categories:

Theme 1: Parental involvement in mathematics homework: From directive to supportive practices

Theme 2: Family-school collaboration as an adaptive practice in homework support

Theme 3: Mothers' reflections on their role: Balancing support and autonomy

Parental involvement in mathematics homework: From directive to supportive practices

The analysis of both the non-participant observations and the semi-structured interviews revealed a spectrum of parental involvement strategies in the children's mathematics homework that is largely influenced by the child's learning profile. Two broad patterns emerged among the parents. On the one hand, parents of children with apparent or diagnosed learning difficulties described a high level of daily involvement in homework in all subjects, often taking an active and directive role. Their support was driven by both the child's needs and their own perception of responsibility. As one mother noted:

> *With my child who has difficulties due to a developmental disorder, I intervene − or rather, I get involved. I guide him.* (Mother B, Interview)

This sense of responsibility is often expressed in a conviction that, the child would not be able to complete the homework successfully without their close supervision. In this way, daily involvement became not only a response to the child's learning difficulties but also an expression of the mother's role as guarantor of academic progress. This type of involvement typically included close supervision, constant presence during homework, and immediate intervention when difficulties arose, often replacing independent effort with guided or co-constructed solutions. Specifically, one parent described the child's reliance on her presence:

> *Mother C begins to read the exercise instructions, analyzes them, and gives directions on how to solve the exercise.* (Researcher, Field notes, 29/03/2023)
>
> *I sit next to him. I don't let him try on his own, because he asks me to.* (Mother C, Interview)

In contrast, mothers of typically developing children reported a more balanced approach with selective support based on child's needs. They supported their children only when difficulties occurred or when assistance was explicitly requested. These mothers aimed to promote autonomy while remaining available as a resource. For example:

> *Mother A said to Jason: 'If you need anything, ask me. Look at the example in the exercise. If you need me, call me.'* (Researcher, Field Notes, 11/3/2023)
>
> *I get involved at the beginning, if he needs help understanding what to do. I might give an answer or solve one problem so he gets the idea.* (Mother A, Interview)

Such statements conveyed trust in the child's capacity to work independently, while positioning the parent as a safety net rather than a constant guide. This approach encouraged children to attempt solutions on their own, promoting responsibility and a sense of ownership over the task. Moreover, a notable strategy in this group was the use of worked examples from textbooks or worksheets to help children grasp the logic of solving mathematical problems. This modeling was sometimes extended by mothers creating additional exercises at home to reinforce understanding. As Mother A explained:

> *We try to make our own examples after each difficult exercise. We have a notebook where I keep track of what he does during the week, and on weekends we solve extra ones − like additions with tens.* (Mother A, Interview)

This emphasis on autonomy was mirrored in children's independent problem-solving behaviors during learning activities. Field observations revealed instances where

children engaged in experiential, hands-on exploration to understand abstract concepts. For example:

> *Christos goes to the kitchen and grabs a banana to check if it's heavier than his pencil. He does the same with his language book and ruler.* (Researcher, Field Notes, 16/5/2023)

These spontaneous actions demonstrate how children may draw on their everyday environment to understand abstract mathematical ideas. They also suggest that when parents hold back, children can develop creative problem-solving strategies that combine blending play with learning in a way that reinforces both understanding and motivation. In addition, such moments illustrate how children actively construct understanding by engaging with their environment − testing, comparing, and experimenting in ways that make learning personally meaningful. These actions are consistent with the parental aim of fostering independence, as children begin to take initiative in their learning beyond direct adult support.

Overall, the findings suggest that parental involvement ranges from intensive guidance to strategic support and is shaped by both the child's learning needs and the mother's perceptions about effective learning assistance. These patterns illustrate that the parental role is not static but fluid and changes in response to the demands of the children and the educational challenges they encounter. This highlights the importance of recognizing parental involvement as a dynamic process rather than a fixed style of engagement.

Family-school collaboration as an adaptive practice in homework support

The second theme explores the relationship between families and schools and their role in shaping parental involvement in mathematics homework. The analysis of the data revealed that mothers generally recognized that the primary responsibility for their child's education lies with teachers. They emphasized that their own involvement should be secondary and aimed at reinforcing what is taught in the classroom rather than replacing or contradicting the teacher's methods. They also emphasized that aligning home support with the teacher's approach is beneficial to their children's learning and avoids confusion due to different methods.

> *Parents should have a secondary role in their child's learning and education. They should follow the teacher's instructions and approach, so that the child can also learn independently.* (Mother A, Interview)
>
> *(Parents) need to follow the teacher's instructions and the approach they use for the child's education so that the child does not get confused by differing methods at home and school.* (Mother B, Interview)

Mothers recognized the importance of communication and collaboration with teachers. For the mothers of typically developing children, contact with the teacher was mostly limited to the beginning of the school year or took place occasionally when an update was needed: 'I go and ask, they don't have anything negative to tell me, that is, everything is fine, he writes, he reads…' (Mother A, Interview). In contrast, the mothers of children with learning difficulties described working more closely with the teacher and reported that they tried to apply similar strategies at home.

> *We had a conversation − I explained how I work with him at home, and he [teacher] told me what he does, and we agreed that having this common framework is helpful for him.* (Mother B, Interview)

This highlights the tendency for more frequent and structured communication between school and home in cases where children experience learning challenges. Such collaboration not only ensured consistency in instructional approaches but also provided reassurance to parents that they were not alone in supporting their child's learning. At the same time, the reliance on teacher guidance positioned educators as key figures in shaping how families organized homework practices, underscoring the interdependence between home and school in fostering children's mathematical development.

Mothers' reflections on their role: Balancing support and autonomy

The third theme concerns parents' perceptions of their role in supporting children's learning at home. Mothers were aware that excessive involvement could affect their child's autonomy and self-confidence. They often reflected critically on their role, acknowledging that excessive assistance might interfere with children's ability to take initiative and think independently:

> *I believe that if you're constantly by the child's side, you may block their autonomy, their initiative, and their ability to act independently − you interfere with their cognitive space.* (Mother C, Interview)
>
> *Parental involvement might prevent the child from feeling confident enough to respond or produce an answer on their own.* (Mother A, Interview)
>
> *When parents don't know how to help, when they discourage rather than support, that undermines both the child's confidence and autonomy.* (Mother B, Interview)

Conversely, mothers felt that parental involvement, when described as supportive rather than directive, made a positive contribution to children's learning, particularly when it came to building confidence and encouraging independent thinking. More specifically, when describing effective involvement, mothers emphasized a supportive − not directive− approach that empowers children:

> *I think the parent's role should be mostly supportive. The child should do the work alone, and parental involvement should be only to assist with specific questions.* (Mother A, Interview)
>
> *Explain the process − not the result. Help them*

figure out how to approach the problem, not just give the answer. (Mother B, Interview)

I believe the parent can empower the child during the learning process by offering corrective feedback, paying attention to areas that need improvement, and at the same time supporting autonomy. (Mother C, Interview)

Whereas mothers acknowledged the importance of encouraging their children to be independent in mathematics homework, mothers of children with learning difficulties expressed the desire to promote autonomy, but often felt unable to implement it. From their accounts, it was clear that the children's frequent requests for help, coupled with the mothers' concerns about their academic performance, made it difficult to step back, even when they recognized the value of independence. This led to a constant balancing act between wanting to give space and feeling compelled to intervene, as illustrated in the following excerpt:

I think there are two ways (of parental involvement). One is to be by the child's side when the child is still young, as in our case, and sit by and watch what the child is doing and help him where needed, and the other way is to let the child try on his own, which is preferable for me, but we haven't succeeded so far, and have a supervisory role, that is, to come and see what the child did and intervene when necessary. (Mother C, Interview)

In summary, while mothers acknowledged their supportive role in the learning process, they also recognized the importance of fostering autonomy and confidence through measured, thoughtful involvement. This tension between intentions and realities was particularly evident with mothers of children with learning difficulties, who often expressed a desire to withdraw but felt compelled to remain closely involved. Their reflections illustrate how parental practices are shaped not only by educational ideals but also by the practical demands of children's needs and parents' own anxieties about academic success. To close this gap, there may be a need for structured guidance for parents on how to balance support and autonomy in everyday homework practices.

Discussion

The findings of this study contribute to the growing body of recent literature on parental involvement in children's mathematics learning, offering a differentiated perspective based on children's learning profiles. The continuum of parental involvement, ranging from directive to supportive practices, reflects adaptive strategies that parents employ in response to their child's unique needs and challenges (Wang & Sheikh-Khalil, 2013; Hill & Tyson, 2009).

Parents of children with diagnosed or suspected learning difficulties tended to adopt a more directive and intensive involvement style, characterized by close supervision, frequent intervention, and active scaffolding. This pattern aligns with contemporary research indicating that parents of children with learning difficulties often take on a hands-on role to compensate for their child's difficulties (Desforges & Abouchaar, 2003; Silinskas & Kikas, 2017). While such involvement is crucial for supporting learning, it can risk limiting the development of the child's independent problem-solving skills and self-confidence, a tension also highlighted by mothers in this study. This balance between providing support and fostering autonomy has been discussed in recent studies emphasizing scaffolding that gradually transfers responsibility to the learner (Patall et al., 2008).

In contrast, parents of typically developing children showed a more balanced and strategic involvement style, intervening selectively to promote autonomy while remaining available as a resource. This finding is consistent with recent theories emphasizing the importance of promoting independence and self-regulation in learning (Pomerantz et al., 2007). Kallia and Dermitzaki (2017) highlight the crucial role of mothers in supporting children's self-regulated learning by identifying specific maternal behaviors that promote children's autonomy and their ability to manage the learning process independently. The use of worked examples and additional exercises at home, as described by Mother A, reflects effective scaffolding techniques that facilitate conceptual understanding without simply providing answers (Swanson & Jerman, 2006). The observations of children actively engaging with their environment to explore mathematical concepts are consistent with constructivist and sociocultural theories that underscore the importance of experiential and sensory engagement in learning.

Collaboration between family and school emerged as a pivotal factor influencing the quality and consistency of homework support. Mothers acknowledged the primary role of the teacher and pointed out the importance of aligning home support with classroom instruction to avoid confusion. This finding resonates with Epstein's (2011) updated framework for family-school partnerships, highlighting coordinated efforts as key to academic success. As Zhou et al. (2020) emphasize, parental and teacher involvement are critical in influencing students' mathematics achievement and attitudes toward homework, highlighting the need for collaborative efforts between home and school. The more frequent and structured communication reported by mothers of children with learning difficulties aligns with recent findings that emphasize the critical role of family-school collaboration (Mokhtar et al., 2023).

However, there are still challenges with parental involvement. Mothers expressed concerns that over-involvement potentially undermining their children's autonomy and self-confidence, an issue supported by contemporary research that warns against parental behaviors that may foster dependency or learned helplessness (Pomerantz et al., 2007; Grolnick, 2009). Furthermore, some parents reported being unsure of how best to support their children, especially those with

learning difficulties, underscoring the need for accessible guidance and resources. This aligns with recent calls from recent educational research advocating for parent training and school-facilitated support to empower families (Gaspar & Sahay, 2025).

These findings should also be considered in relation to the participants' social and educational background. All mothers had completed at least higher education and most families belonged to a middle-income socioeconomic group. This relatively advantaged context may have influenced how parents understood their role, enabling them to emphasize autonomy and supportive involvement while still ensuring academic achievement. Prior research suggests that parental education and socioeconomic resources shape both the level and the style of involvement in children's schoolwork (Civil, 2009; Hernández-Padilla et al., 2023; Wang & Wei, 2024). In line with these studies, the mothers in this research −drawing on their own educational capital− appeared confident in navigating between directive and supportive practices. At the same time, their reflections indicate that even in this relatively resource-rich context, tensions between fostering independence and providing support persisted, underscoring the complex and situated nature of parental involvement in mathematics homework.

Limitations

This study involved a small number of participants and focused exclusively on mothers. Mothers were included because they were the main carer supervising homework in the households studied; however, future research should also include fathers and other caregivers, whose perspectives may reveal different patterns of involvement. Moreover, the relatively brief observation period offers only a snapshot of family practices and does not capture how involvement may shift over time or in response to school changes. Despite these limitations, the small and diverse sample provided the opportunity for in-depth qualitative insights into the nature of parental involvement. The findings highlight the nuanced ways in which parents adapt their support strategies to their children's learning needs.

Implications for educators

The findings of this study suggest several implications for educators seeking to strengthen family-school collaboration in mathematics learning. First, teachers should recognize that parents often struggle with the balancing act of supporting and fostering autonomy. Providing parents with practical guidance on scaffolding strategies −for example, how to encourage persistence without taking over tasks− may help ease this tension. Second, educators can play a key role in allaying parents' anxieties about mathematics by spreading positive messages about learning through mistakes and by modeling constructive feedback practices. Third, the results highlight the need for communication strategies that address the varied experiences of families of children with and without learning difficulties. Tailored communication can help parents feel able to support their child's learning in a way that builds both competence and confidence. More broadly, schools may consider developing workshops or information sessions where parents can share experiences, learn about effective homework support strategies, and strengthen their confidence in guiding their children. Such initiatives could be particularly beneficial in contexts where parents of children with learning difficulties feel isolated or uncertain about how best to support their child.

Future research

Future studies should extend these findings in several directions. Particularly, there is a need to examine more closely how parental involvement is related to teacher practices and classroom dynamics. Including the teachers' perspective would provide a fuller understanding of the home-school connection as a lived and dynamic process. Moreover, broadening the family constellations would enrich the analysis. In particular, examining the paternal perspective and the role of other caregivers could reveal different patterns of support in children's mathematics learning at home. Finally, investigating parental involvement in the post-pandemic context may uncover new dynamics, as remote and hybrid learning experiences have reshaped homework practices and family-school communication.

Conclusion

This study illuminates the diverse spectrum of parental involvement in children's mathematics homework and shows that parental strategies range from directive to supportive and are significantly influenced by children's individual learning needs. The findings underscore the necessity of a delicate balance between necessary guidance and encouragement of autonomy, as this equilibrium is crucial for nurturing children's self-confidence and independent problem-solving abilities. Additionally, the research emphasizes the central role of effective family-school partnerships in harmonizing home support and classroom instruction, particularly for students with learning difficulties.

A key contribution of this study is its conceptualization of parental involvement not as a fixed or uniform practice, but rather as a dynamic, adaptive process influenced by emotional, cognitive, and −most notably− contextual factors. Systematic home observations demonstrate that parents do not simply assist with homework tasks; rather, they actively interpret, negotiate, and occasionally

grapple with their roles. This inherent fluidity calls for a socio-cultural perspective that acknowledges the nuanced complexities of everyday parental engagement.

Furthermore, the research provides critical insights into the potential disconnect between parental intentions and their actual practices. While mothers articulated a strong preference for fostering independence, those with children experiencing learning challenges often found themselves intervening more extensively than desired. This tension underlines the methodological value of on-site observation, which captures the discrepancies between stated beliefs and actual behaviors. Such findings can lead to the development of tailored and practical support programs based on parents' lived experiences.

Reflecting on these insights, the study highlights the need for targeted parental counselling to help families manage their support role effectively, while suggesting avenues for future research to improve mathematics learning at home. Potential initiatives include culturally responsive parent training programs, structured opportunities for collaboration between teachers and parents, and the integration of home learning practices into broader school curricula. Ultimately, fostering a more inclusive and reflective understanding of parental involvement −grounded in empirical fieldwork− provides a vital framework for advancing equitable learning opportunities for all children and aligning with broader goals of educational equity and social justice.

Authors' contributions

Both authors contributed to the study's research design. The second author conducted the fieldwork and data collection. Data analysis was carried out through joint discussion and interpretation. The first author prepared the initial draft of the manuscript, and both authors revised and approved the final version.

Conflicts of interest

The authors declare no conflict of interest.

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Declarations

Informed consent has been obtained from the parents of all subjects participating in the study.

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