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Parental Involvement in Mother-Tongue Mathematics Education: A South African Study

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Abstract. Mathematics education in the mother tongue (MT) has been debated and implemented worldwide. This study investigates the perceived successes or lack of mathematics education in MT by exploring the influence of parental involvement on its success. Although MT instruction improves understanding and cultural identity, challenges like systemic barriers and a lack of parental support weaken its implementation. Despite MT policies, parental support remains understudied in township schools. This study aims to address this gap and provide insights for educational equity and policy improvement. The research focuses on South African township schools to examine how parental engagement affects the success of MT mathematics programmes and identifies obstacles to home-school collaboration. Through a qualitative case study involving semi-structured interviews with 10 mathematics teachers from five schools, data was thematically analysed to understand views on MT instruction, parental involvement and institutional challenges. Findings show a paradox where; despite recognizing MT's educational benefits, many parents resist MT due to the perceived economic advantage of English. Furthermore, teachers linked poor mathematics performance to low parental involvement." Resistance to MT-based learning results in shifting to English-medium schools, with challenges like inadequate materials and limited teacher training. The study finds Epstein's parental involvement framework misaligned with realities, hindering effective home-school partnerships in resource-poor, multilingual areas. It suggests three actions: educate parents on MT's benefits, reform policies to fill MT vocabulary gaps, and adapt Epstein's model to engage diverse families. This research provides a framework to improve global MT mathematics education.

Keywords: Parental Involvement; Mother-Tongue Education; Epstein's Framework; Multilingualism; Mathematics Education; South African Schools; Community Engagement; Educational Equity; Language Policy; Home-School Partnerships

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1. Introduction and Background

Mother tongue (MT) instruction refers to the use of a learner's home language as the language of learning and teaching in formal education (Diba & Priyadarshini, 2023). Furthermore, the use of the MT in mathematics teaching provides learners with a strong foundational understanding of concepts (Esuong et al., 2024). However, globally, mathematics education continues to face persistent achievement gaps, particularly in multilingual contexts where instruction often occurs in non-native languages. This creates cognitive barriers for learners, especially in under-resourced communities. In South Africa, township schools exemplify this challenge, where English is frequently used as the medium of instruction despite learners having limited fluency in the language. Mathematics, a compulsory subject in the early grades, becomes even more daunting under these conditions, contributing to poor learner performance and widening educational inequalities (Alimi et al., 2020).

In response, there is growing recognition of the value of MT instruction in mathematics education. Teaching mathematics in learners' home languages has been shown to enhance conceptual understanding, promote active classroom participation, and preserve cultural identity (Baquiller & Abellon, 2021). However, the success of MT-based education is not solely dependent on classroom practices – it also hinges on the role of parents. Parental involvement, as defined by Kaplan and Bista (2022), refers to structured support in homework, school events and policy dialogue. This involvement is a critical factor in reinforcing school-based learning, especially in early education, where home support can significantly influence academic outcomes (Gross et al., 2020).

Despite this interdependence, there remains a significant gap in understanding how parental engagement functions in MT mathematics contexts, particularly in communities where parents may view English as a more economically advantageous language. This perception often leads to scepticism about the value of MT education, resulting in limited parental support or even withdrawal from MT programmes. These dynamics are especially pronounced in South African township schools, where systemic barriers, such as inadequate teacher training and limited MT resources, further complicate the implementation of MT instruction (Maluleke, 2019; Prinsloo & Harvey, 2020).

This study investigates how parental involvement influences the success of MT mathematics education in Tshwane North township schools. It explores the benefits and challenges of MT instruction, the perceptions of teachers regarding parental engagement, and the broader implications for student performance and educational equity. The research question guiding this study is: "How does parental involvement influence the success of mathematics education delivered in the MT, and what are the implications for students' academic performance and parental engagement?"

Using a qualitative research design, the study draws on interviews with teachers and a comprehensive review of relevant literature to examine the interplay between parental involvement and MT mathematics outcomes. The findings

suggest that while MT instruction has the potential to improve learner performance, its effectiveness is undermined by parental resistance, often rooted in socioeconomic concerns and a lack of confidence in supporting MT-based learning at home.

This paper argues that active parental involvement is essential for the success of MT mathematics education. It can mitigate challenges such as vocabulary limitations and teacher proficiency issues, while also fostering stronger home-school collaboration. The study recommends that education stakeholders promote MT instruction alongside initiatives that support parental literacy and mathematics engagement. By identifying the challenges and opportunities of MT-based education, the findings aim to inform policies and practices that enhance linguistic diversity, improve mathematics outcomes and promote educational equity in multilingual settings.

2. Literature Review

2.1 Parental Involvement in Mathematics Education

The role of parents in supporting MT-based mathematics learning emerges as a critical factor in educational success. Research demonstrates that active parental engagement significantly enhances learning outcomes, particularly when support is provided in a shared mother tongue (Gross et al., 2020; Iwaniec, 2020). This involvement manifests in two primary forms: home-based and school-based participation. Home-based support includes assisting with mathematics homework and creating a language-rich learning environment, while school-based involvement encompasses attending parent-teacher meetings and participating in school governance (Lara & Saracostti, 2019).

However, the effectiveness of such involvement is often constrained when parents themselves lack confidence in the MT as an academic language or when schools fail to establish clear communication channels (Tan et al., 2020). Epstein's framework proves particularly relevant here, highlighting how successful parental engagement requires structured opportunities for learning at home, effective school-to-home communication, and meaningful parental input in decision-making processes (Zierer, 2021). The literature suggests that targeted parent education programmes, designed to build both mathematical and linguistic confidence, could bridge this gap (Anthony & Ogg, 2019).

2.1.1 The Transformative Benefits of Parental Involvement

The literature consistently demonstrates that meaningful parental involvement yields multifaceted benefits for MT mathematics education. When parents actively engage in their children's mathematical development using shared linguistic and cultural frameworks, students show marked improvements in both conceptual understanding and academic performance (Gross et al., 2020). This involvement proves particularly powerful when it moves beyond basic homework supervision to include rich mathematical discussions in the home environment (Lara & Saracostti, 2019). Children benefit from the cognitive advantage of learning complex concepts in their most fluent language while simultaneously developing stronger cultural and mathematical identities

(Mamedova & Orosco, 2024). Furthermore, schools that successfully engage parents in MT mathematics programmes report higher levels of student motivation and attendance, as families feel greater ownership of the educational process (Smith et al., 2019). These benefits extend beyond academics, strengthening family bonds through shared learning experiences and preserving intergenerational linguistic knowledge (Tan et al., 2020).

2.2 Language Policy Challenges in Mathematics Education

The implementation of mother-tongue mathematics instruction faces numerous policy-related challenges that hinder its effectiveness. A primary obstacle involves the limited academic vocabulary available in many indigenous languages for teaching advanced mathematical concepts (Mashige et al., 2019; Visser et al., 2019). This lexical gap forces teachers to either code-switch or develop improvised terminology, potentially compromising conceptual clarity (AlZain, 2024). Teacher proficiency presents another significant barrier, as many educators lack adequate training in MT pedagogy or feel more comfortable teaching in colonial languages (Zierer, 2021).

Perhaps most notably, parental resistance to MT instruction frequently undermines policy implementation, particularly in communities where English is perceived as offering greater economic mobility (Malindi et al., 2023; Moshaba, 2020). This resistance manifests in various ways, from enrolling children in English-medium schools to discouraging MT use at home (Tan et al., 2020). The literature reveals a troubling disconnect between progressive multilingual policies and ground-level implementation, suggesting the need for more nuanced approaches that address community concerns while maintaining educational quality (Calvo & Villarreal, 2018).

2.2.1 Persistent Challenges in Language Policy Implementation

Despite these potential benefits, significant challenges hinder effective implementation of MT mathematics policies. The lexical gap in many indigenous languages for expressing abstract mathematical concepts creates daily obstacles for teachers and learners alike (Mashige et al., 2019). This challenge is compounded by the acute shortage of high-quality teaching materials and standardised terminology across different MTs (Visser et al., 2019). Teacher preparation programmes often fail to adequately equip educators with both the mathematical content knowledge and linguistic skills needed for effective MT instruction (Zierer, 2021).

Perhaps most critically, deep-seated societal beliefs about the superiority of colonial languages undermine policy implementation, as evidenced by parental preferences for English-medium instruction (Malindi et al., 2023). These challenges are further exacerbated by assessment systems that frequently privilege dominant languages, creating disincentives for full policy adoption (Calvo & Villarreal, 2018).

2.3 Stakeholder Roles in MT-Based Mathematics Education

The success of MT mathematics education depends on the coordinated efforts of multiple stakeholders, each with distinct but complementary roles. Teachers serve

as the primary implementers, requiring both subject-matter expertise and linguistic competence to deliver effective MT instruction (Alonzo et al., 2024). Their challenges are particularly acute in multilingual classrooms, where they must often navigate between official language policies and student needs (Mokikwa & Mokhele-Ramulumo, 2024). School principals play a pivotal leadership role in creating an inclusive school culture that values MT education while facilitating meaningful parental engagement (Smith et al., 2019; Abizada & Seyidova, 2021). At the policy level, education authorities must address systemic barriers by investing in teacher development, creating standardised MT resources, and developing realistic implementation timelines (Malindi et al., 2023).

Parents, as crucial stakeholders, contribute both as home-based educators and as advocates for quality education (Lara & Saracostti, 2019). The literature emphasises that effective collaboration among these groups requires clear communication channels, shared goals, and mutual respect for each stakeholder's expertise and perspective (Copado et al., 2023). When these elements align, MT mathematics education shows remarkable potential for improving both academic outcomes and cultural preservation (Esuong et al., 2024; Tan et al., 2020).

2.3.1 Essential Stakeholder Roles and Responsibilities

The complex ecosystem of MT mathematics education requires clearly defined and mutually supportive roles for all stakeholders: Teachers serve as the crucial bridge between policy and practice, requiring ongoing professional development that combines mathematical pedagogy with linguistic flexibility (Alonzo et al., 2024). Their daily classroom decisions about code-switching and terminology adaptation significantly impact learning outcomes (Maluleke, 2019). School leaders must create inclusive environments that value MT while strategically addressing community concerns (Abizada & Seyidova, 2021).

This includes developing clear communication strategies to help parents understand the cognitive benefits of MT learning (Smith et al., 2019). Policy-makers bear responsibility for providing adequate resources, including standardised terminology guides and culturally relevant teaching materials (Malindi et al., 2023). They must also address systemic barriers like high-stakes assessments that disadvantage MT learners (Calvo & Villarreal, 2018). Parents play dual roles as home-based learning facilitators and community advocates for quality MT education (Lara & Saracostti, 2019). Their engagement helps validate the importance of MT learning while providing crucial linguistic support (Tan et al., 2020).

2.4 Toward a Cohesive Implementation Framework

The literature suggests an integrated framework for advancing MT mathematics education must simultaneously address three critical dimensions: First, capacity-building initiatives should combine teacher development with parent education programmes, creating a shared understanding of mathematical concepts across school and home environments (Anthony & Ogg, 2019). These programmes must specifically address the linguistic aspects of mathematics teaching and learning (Zierer, 2021). Second, resource development efforts should focus on creating

culturally meaningful mathematics materials that bridge conceptual understanding with linguistic accessibility (Mashige et al., 2019). These efforts include visual representations and concrete examples that transcend language barriers (Visser et al., 2019). Third, policy reforms must align assessment practices with MT instructional goals while addressing legitimate parental concerns about future opportunities (Malindi et al., 2023). Such reforms require honest dialogue about language hierarchies and economic realities (Moshaba, 2020). When these dimensions are addressed cohesively, MT mathematics education can fulfil its dual promise of improving learning outcomes while sustaining linguistic diversity (Prinsloo & Harvey, 2020). The path forward demands sustained collaboration among all stakeholders, with each recognising their complementary roles in this transformative educational endeavour (Copado et al., 2023).

3. Theoretical Framework

For this study, the Epstein Model, which is considered a complex and ecological theory that creates a solid partnership between the family and the school, was adopted as the theoretical framework (Epstein, 1987). The benefits of this model are that it clearly distinguishes the relationship between birth order and academic achievement in middle childhood, and it highlights the importance of the school and community spheres in shaping academic performance. Birth order is often considered in developmental and educational research because it can influence a child's personality, behaviour and academic outcomes.

In Epstein's model, academic performance is characterised by the family, the school, and the community (Copado et al., 2023). The Epstein Model emphasises parent-child discussion, parental expectations for education, family environment in learning support, parental involvement in homework beliefs, parents' attitudes on the importance of specific subjects like mathematics and language, and self-assessment of their skills to help their children (Epstein, 1987). This model also emphasises how sibling structure improves academic performance through social support, academic assistance, guidance and encouragement.

In this study, teachers were not given specific instructions on how to increase parental involvement in MT-based mathematics education. Based on South Africa's multilingual policy, the Epstein Model was misapplied. Teachers and parents were not encouraged to work together to improve student performance. The most crucial stage of the Epstein Model, parent involvement in homework beliefs and attitudes toward subjects like math, was ignored (Epstein, 1987).

Before implementing the language policy, school management had to consider the challenges teachers faced when switching from English to their MT for mathematics. Each stage of the Epstein Model lets implementers assess mathematics education progress and adjust. The model shows where teachers failed to involve parents to improve student performance (Epstein, 1987) and where the recommendations of the model were not followed correctly. Therefore, the Epstein Model stages were not implemented well.

The Epstein Model's six types of parental involvement require thoughtful, context-specific adaptation to address South Africa's complex linguistic landscape and socioeconomic inequalities. Rather than viewing the model as a static checklist, this implementation reconceptualises it as a dynamic, community-rooted partnership aligned with equity and multilingual inclusivity.

Type 1: Parenting

Traditional parenting workshops often fail to support parents navigating unfamiliar educational content in unfamiliar languages. To address this, schools should co-develop multilingual glossaries of mathematical terms in mother tongues such as Xitsonga, Sepedi and isiXhosa, supplemented by short demonstration videos showing how to explain core concepts at home. The Limpopo case (Ramothwala et al., 2024) demonstrates that when parents are engaged in creating these resources, accessibility and relevance improve significantly.

Type 2: Communicating

Effective school-to-home communication must reflect linguistic diversity. This practice will enable parents to actively participate in their children's education and help establish collaboration between home and school (Glottodidactica, 2023; Ndlovu, 2023). Schools should provide notices, newsletters and assessment feedback in multiple languages and leverage multilingual school apps or WhatsApp broadcasts. Voice notes in mother tongues can be especially useful for low-literacy parents, bridging communication gaps and promoting transparency.

Type 3: Volunteering

Volunteering is often hampered by language barriers and rigid school schedules. Drawing from Eastern Cape data, Ndlovu (2023) proposes a "Community Math Volunteer Corps" that recruits and trains bilingual parents to assist in classrooms and support learners in their home languages. Strategies include rotating language tables during math sessions for peer-assisted learning in Sepedi, isiXhosa, and other local languages; transportation stipends and flexible volunteer hours (evening/weekend slots) to increase accessibility for working parents; and empower parent volunteers to act as a liaison between teachers and non-English-speaking families. This approach promotes inclusion and empowers parents as co-educators.

Type 4: Learning at Home

Home learning support must be reconceptualised to empower parents with limited academic literacy. "Flipped homework" strategies are essential: teachers can record short mother-tongue audio explanations of math activities and distribute them via WhatsApp. This method has proven particularly effective among Sepedi-speaking communities, where up to 68% of parents report struggling with mathematical terminology. Such micro-interventions enable parents to assist meaningfully without needing formal education.

Type 5: Decision-Making

The Gauteng Department of Education (GDE, 2023) revealed that 83% of schools lacked structured community input into language policy and curriculum decisions. To remedy this, we recommend the formation of School Language Councils with at least 40% parent representation. These councils would review and approve all mother-tongue instructional materials; co-develop school language and mathematics policy; and assess teacher training gaps from a parental perspective. In addition, participatory budgeting should be introduced to involve parents in allocating funds for MT (mother tongue) programmes. Quarterly “Language of Learning” public forums – conducted in community languages – should become a requirement for policy rollouts, ensuring transparency and cultural congruence.

Type 6: Collaborating with the Community

Community collaboration must move beyond tokenistic outreach. The GDE (2023) evaluation underscores the need to dismantle top-down policymaking in favour of grassroots design. Local MT committees – comprising parents, educators and traditional leaders – should vet mathematics content for cultural and linguistic relevance; co-design school-based math festivals to celebrate learning in home languages; and facilitate intergenerational math dialogues that leverage elders’ indigenous knowledge systems. This approach restores community agency and ensures that learning is embedded in local realities.

Systemic Adjustments for Sustainability

Adjustments would include:

- Policy mandate – the co-development of MT learning materials as a condition for parental engagement funding within the national school budget framework.
- Teacher training – embed Epstein’s adapted framework into teacher education programmes, with modules on multilingual family engagement and culturally responsive mathematics teaching.
- Assessment and monitoring – include parental engagement metrics in school performance evaluations, such as participation rates in home-language workshops and frequency of mother-tongue communication initiatives.

3.1 Reframing the Model

This localised adaptation of Epstein’s framework shifts the paradigm from prescriptive implementation to inclusive co-creation. It honours linguistic diversity, decentralises decision-making, and positions parents not merely as supporters but as strategic partners in their children’s education.

Table 1: Integrated Implementation Table: Epstein's Model Adapted for South African Schools

Epstein Type	Key Challenges	Contextual Adaptation (South Africa)	Expected Impact
Type 1: Parenting	Generic, English-only parenting workshops fail to address multilingual needs.	Co-develop multilingual math glossaries (e.g., Sepedi, isiXhosa) and video demos in home languages with parents.	Improved parental confidence; better home support for learning; culturally relevant engagement.
Type 2: Communicating	Language barriers hinder clear communication between schools and parents.	Use WhatsApp, SMS and voice notes in multiple languages; send reports and notices in home languages.	Increased parental understanding of learner progress and school expectations.
Type 3: Volunteering	Limited participation due to language gaps, work schedules and low confidence.	Launch "Community Math Volunteer Corps" with bilingual parent volunteers, language tables and flexible schedules.	Greater classroom support, enhanced home-school relationships and parent empowerment.
Type 4: Learning at Home	Parents lack academic literacy to help with homework in English.	Teachers provide flipped homework via short WhatsApp audio clips in mother tongues explaining tasks.	Enables parents to support learning regardless of formal education levels; reduces learner frustration.
Type 5: Decision-Making	Minimal parental input in MT and curriculum decisions (83% exclusion in Gauteng).	Form School Language Councils with 40% parent representation; participatory budgeting; forums in home languages.	Democratic decision-making; increased relevance and accountability in school programmes.
Type 6: Collaborating with the Community	Top-down programmes lack cultural relevance and community ownership.	Establish local MT committees of parents, educators and traditional leaders; plan community math festivals.	Culturally grounded learning; stronger community-school partnerships; revitalised indigenous knowledge.

4. Research Methods

This qualitative study used case study research and interpretivist principles to understand the participants' views on successes or lack of mathematics education in MT by exploring the influence of parental involvement on its success.

4.1 Sampling

Purposive sampling was used to select 10 teachers from 5 schools. Participants were selected based on the following criteria: They should be knowledgeable in their learners' MT; have 3 years of teaching mathematics in Grades 1 to 3; and have teaching experience in learners' MT.

4.2 Interviews

Semi-structured interviews, each lasting approximately 45 minutes, were conducted in the participants' preferred languages to ensure comfort and clarity. Teachers from five different schools participated in the study. To maintain confidentiality, pseudonyms were used to label participants as follows:

School A: T1A and T2A

School B: T3B and T4B

School C: T5C and T6C

School D: T7D and T8D

School E: T9E and T10E

Furthermore, to enhance transparency and ensure consistency across interviews, the semi-structured interviews were guided by the following core questions:

- To what extent are parents involved in your school, especially in mathematics education, using the mother tongue?
- What challenges do parents face in supporting their children's mathematics education when it is taught in the mother tongue?
- Based on your experience, how does the language of learning and teaching affect parents' ability to assist their children?
- Which strategies have your school or the education department implemented to promote parental engagement?

4.3 Analysis

Thematic analysis followed Braun and Clarke's (2006) six-phase framework: transcribed interviews from 10 teachers were read multiple times to gain an in-depth understanding; the data was manually coded using inductive coding; codes were grouped into themes (e.g., 'communication gaps'); and themes were used to guide discussion. The themes were named, and a report was produced to bring the study close.

4.4 Trustworthiness

Trustworthiness was established using the following criteria as guided by Braun and Clarke (2006):

- Credibility through engagement with data for an extended period, and peer debriefing with a colleague familiar with qualitative research to cross-check the coding and interpretation process.
- Transferability, the research context, the participants and findings of the study were described in detail to make it easy for readers to determine if the study findings could apply in other situations.
- Dependability, the research process was clearly documented, including coding decisions and the development of themes, to allow replication.

- Confirmability, participants' direct quotations were used to demonstrate that the findings were not the opinion of the researcher.

4.5 Ethical Considerations

Ethical issues were addressed by ensuring that participation was voluntary, participants had the right to withdraw from participation, and their anonymity was assured.

5. Results

Themes emerged inductively via iterative coding (Saldaña, 2021). Two researchers coded independently, achieving 85% intercoder reliability.

5.1 Theme 1: Poor parental participation in the education of learners

In this study, 7 of 10 teachers (70%) reported little success in MT mathematics education due to low parental participation. Parental involvement is crucial to a child's education. Schools with high teacher-parent engagement perform better academically. Thus, parental involvement in school activities is crucial for students' success because it improves learning and school experiences. In this study, teachers reported little success in MT mathematics education due to low parental participation.

"I don't want to lie; in this 21st century, I do not see any success in using MT ... Even parents cannot help their children with homework ... they will say that they do not understand ... come to the teacher and say that they did not help their learner because the MT is difficult. Others will say that they did a different MT and not the school's one." (T4B)

"Parents, mostly in the township schools, do not understand why they have to assist their children with homework, as they perceive this as the work of teachers. ... It was even more [so] when it relates to Mathematics being offered in MT as they complained that this is a very difficult subject, and they will not be able to explain it to their children even in MT." (T8D)

Interviews showed that poor parental involvement in their children's education hurt MT mathematics education. Thomas et al. (2020) found that parental disengagement is a major cause of students' underperformance, which can lead to failure or dropping out. Prinsloo and Harvey (2020) also noted that when parents and teachers do not collaborate, student performance, especially in mathematics, will not improve.

Other participants, such as T5C, revealed that negative attitudes were displayed by parents instead of affording school principals with opportunities to implement strategies that could promote parental engagement between teachers and schools. Parents sent their kids to English-only schools, making matters worse.

"Even the parents like English; they do not like this MT ... Some parents took their children away, saying that they ... wanted their children in English schools." (T5C)

According to the above responses, parents were not interested in schools that used MT as a language of learning, including mathematics in another language. Moshaba (2020) argued that teachers in Tshwane North District schools who offered mathematics in their MT had trouble coping because it made teaching difficult. Additionally, parents sent their children to English-taught Model C schools. Tan et al. (2020) found that using the MT to teach mathematics and not involving parents hampered lower-grade students' academic performance.

5.2 Theme 2: Lack of communication and adequate consultation with parents

Communication and consultation with parents are needed to achieve common goals. Adequate communication and thorough consultation could be used to ask clarifying questions to help parents understand GDE and school initiatives. Most teachers complained that parents are not adequately consulted and informed about their role in collaborating with schools to achieve common goals. In responding,

"I did not see any success in the implementation of this process. It is terrible because they would do MT in Grade 3 and struggle with English in Grade 4 ... Then you have to explain to the parents that the government decides to do MT. Parents are also not engaged and communicated to so that they can understand the roles to be played by them." (T3B)

In support, T4B also emphasised that parents must be consulted to obtain buy-in and to ensure that there is active parental involvement in the education of children.

"When children become proficient in English at an early age, teachers and parents believe that their educational journey becomes lighter and brighter. ... parents are not informed about the reasons for their learners to learn in a MT in Grades 1–3 and for the transition to English in Grade 4."

The above responses show that education authorities are not communicating well about GDE policy changes and other initiatives. Johnstone (2018) and Mphahlele et al. (2022) advise policymakers to consult parents. Increased parental involvement improves student success, parent and teacher satisfaction, and the school environment (Cruickshank, 2024; Van der Berg et al., 2016). By contrast, lack of parental involvement in their children's academic activities contributes to low academic achievement (Wildmon et al., 2024). Another reason for low parental involvement is that many parents thought their children's schools did not need them (Beard, 2017). Sometimes, they felt unwelcome (Alexander et al., 2017) while communication and sociocultural contexts could limit parental involvement (Hourani et al., 2012).

However, Beaver et al. (2018) state that it is the teacher's responsibility to make sure that the communication lines with parents are open. Despite the problems mentioned, it is the parents' responsibility to become involved with their children's teachers and schools. In addressing this gap, digital communication platforms like ClassDojo, email, and school apps have been successfully used to strengthen the partnership between teachers and parents in limited face-to-face interaction (Chen & Rivera-Vernazza, 2022). These platforms are useful in

updating personalised messages and multimedia sharing, enhancing transparency and trust. Furthermore, language-specific newsletters can help overcome language barriers, ensuring all parents, regardless of language proficiency, receive clear and culturally relevant information. In support, Chen and Rivera-Vernazza (2022) explain that this approach is best in improving understanding and affirmation of parents' identities and participation encouragement.

5.3 Theme 3: Lack of knowledge of the language of learning and teaching

Parents can actively participate in their children's education if they speak the school's language. This may cause students to confuse school and home content explanations. Teachers argued that language barriers prevent parents from actively participating in their children's education, especially if they do not speak English or the MT, which they may not know.

"Parents of learners were not involved in their children's education because they did not speak at home the LoLT that the school offered."
(T5C)

"I am worried because most words are not available in Sepedi, such as 3-D shapes. So, I survive by using English. Parents might also struggle to assist their children with assessments if they don't understand the concepts in MT." (T10E)

The responses above show that the language barrier contributes to parental disengagement from education. Language and cultural barriers prevent ethnically diverse parents from engaging (Beard, 2017). Benu (2018) noted that schools struggled to engage parents of diverse ethnicities.

This issue has been addressed globally using bilingual and multilingual education models that are used to promote the use of learners' mother tongue during teaching and learning. Ball and Le Pichon (2025) assert that this model is important because it assists in promoting both learners' cognitive development and empowering parents in participating in their children's education with confidence. For example, schools that use the language-friendly school approach are encouraged to embrace language diversity by incorporating the home languages during teaching and learning.

As such, the stronger community support is established, particularly when parents feel that their languages are respected. Furthermore, teachers are not required to be fluent in all home languages, but focus on flexible multilingual strategies like translated material, peer language support and multilingual signage. Elements of these bilingual education models can be useful in bridging the gap between mother tongue and school languages when adopted in South Africa.

5.4 Theme 4: Lack of proper and effective strategies in ensuring active parental involvement

GDE authorities and school management cannot expect miracles in ensuring effective teaching and learning in schools, especially in teaching mathematics

using MT, without effective and radical strategies that are consistently followed. Participants said the Department of Basic Education has several policies to help SMTs and parents but enforcing them is difficult.

“The GDE is developing policies, but they can’t even stick to the same policies. ... We, as SMT, must ... put pressure on parents to be active participants in the schools. These measures must not be harsh, but parents must be held accountable if they do not participate in school activities and curriculum-related matters.” (T8D)

The response above suggests that enforcing policy could help parents participate in learners’ education. These arguments suggest that authorities should identify intervention strategy gaps. Davids (2015) suggests new methods for improving school learning, which can improve existing measures and ensure policy and regulation compliance. This evaluation will help schools contextualise their framework. According to Zou (2023), parents’ education and involvement with children strongly affect home support. Van der Berg et al. (2016) identified platforms that can affect home-background learning, including (a) access to material resources for early stimulation and learning; (b) home teaching support; (c) a learning-friendly home environment; and (d) parents who wanted their children to attend a good school.

6. Conclusion

This study explores the intricate relationship between MT mathematics instruction and parental involvement, revealing persistent challenges that hinder effective implementation in multilingual, resource-constrained settings. Key barriers include lexical limitations in indigenous languages, insufficient teacher training in MT pedagogy, and widespread parental scepticism regarding the academic and economic value of MT education. Many parents, perceiving English as a gateway to upward mobility, either disengage from their children’s MT-based learning or transfer them to English-medium schools. This lack of parental support, compounded by weak policy implementation and limited resources, undermines the cognitive and cultural benefits that MT instruction can offer, such as improved conceptual understanding and affirmation of learners’ identities.

The study draws on Epstein’s model of parental involvement to analyse these dynamics, focusing on home-school collaboration, learning at home and shared decision-making. While the model provides a useful framework, the findings reveal significant gaps in practice: schools often lack effective communication strategies, and many parents feel ill-equipped to support MT learning due to language barriers and limited confidence. These shortcomings suggest that current applications of Epstein’s framework are often superficial and not adapted to the realities of multilingual communities. The broader implications are substantial. Although MT instruction has the potential to reduce linguistic barriers in mathematics education, its success depends on addressing structural inequities such as the dominance of English in assessments and employment, which drive parental resistance.

7. Synthesis

The intersection of parental involvement, language policy and stakeholder collaboration presents both challenges and opportunities for MT mathematics education. While the benefits of mother-tongue instruction are well-documented, including improved conceptual understanding and cultural affirmation (Gross et al., 2020), significant implementation barriers persist. These include lexical gaps in academic terminology, uneven teacher preparation, and community scepticism about MT's economic value (Moshaba, 2020; Zierer, 2021). Moving forward, the literature suggests three key priorities: developing comprehensive teacher training programmes that address both pedagogical content knowledge and language proficiency; creating culturally relevant mathematics resources that bridge the vocabulary gap while maintaining conceptual rigour; and establishing sustainable models for parental and community engagement that address legitimate concerns while demonstrating MT's educational value (Anthony & Ogg, 2019; Smith et al., 2019).

8. Recommendations

The following recommendations are made:

- A dual approach is recommended for enhancing parental engagement through culturally responsive strategies like MT-based workshops and collaborative curriculum planning and advocating for systemic reforms that legitimise MT instruction as both a pedagogical asset and a tool for equity.
- The Epstein Model is recommended to assist with the analysis of each individual school to provide context-based support and ensure the active participation of parents towards success in mathematics offered in the MT. The model should be adapted through community workshops and bilingual homework guides to enhance its effectiveness and accessibility.
- Policymakers should plan and offer structured parent-training programmes to enhance MT-based mathematics support at home, alongside teacher development initiatives in MT pedagogy.
- Schools should hold regular parent-teacher workshops to ensure collaboration and address misconceptions about MT instruction, complemented by quarterly MT math nights where teachers model problem-solving in parents' home languages.

9. Future Directions

Future research should focus on documenting successful implementation models in diverse contexts, with attention to the contextual factors that enable their success (Malindi et al., 2023). By exploring these alternatives, education systems can better harness the potential of mother tongue instruction to transform mathematics learning while preserving linguistic diversity. Future research should explore how the three key priorities of training, resource development and different models can be adapted across diverse contexts to ensure MT mathematics education supports both academic success and cultural preservation. For future research, longitudinal studies could also be conducted to assess the long-term impact of parental involvement on MT-based mathematics performance.

10. References

- Abizada, A., & Seyidova, S. (2021). The effect of the Russian language immersion on academic achievement of students whose mother tongue is Azerbaijani. *Innovation: The European Journal of Social Science Research*, 37(2), 1-18. <https://doi.org/10.1080/13511610.2021.1891026>
- AlZain, M. A. (2024). Code-switching in translation: Linguistic analysis of multilingual texts and their translations. *International Journal of Linguistics, Literature and Translation*, 7(10), 119-134. <https://doi.org/10.32996/ijllt.2024.7.10.12>
- Alexander, J. D., Cox Jr, R. B., Behnke, A., & Larzelere, R. E. (2017). Is all parental "noninvolvement" equal? Barriers to involvement and their relationship to Latino academic achievement. *Hispanic Journal of Behavioral Sciences*, 39(2), 169-179. <https://doi.org/10.1177/0739986317700837>
- Alimi, F. O., Tella, A., Adeyemo, G. O., & Oyeweso, M. O. (2020). Impact of mother tongue on primary pupils' literacy and numeracy skills in Osun State. *International Online Journal of Primary Education*, 9(2), 144-155. <https://dergipark.org.tr/en/download/article-file/2404725>
- Alonzo, D., Asih, R. A., Oo, C. Z., Pelobillo, G., & Lim, R. A. (2024). Key elements of effective mandatory professional development programs. *International Journal of Instruction*, 17(3), 355-370. <https://doi.org/10.29333/iji.2024.17319a>
- Anthony, C. J., & Ogg, J. (2019). Parent involvement, approaches to learning, and student achievement: Examining longitudinal mediation. *School Psychology*, 34(4), 376. <https://scholar.google.co.za/scholar>
- Ball, M. C., & Le Pichon, E. (2025). Fostering community support for multilingual education: the language friendly approach. *Language and Education*, 1-20. <https://doi.org/10.1080/09500782.2025.2538840>
- Baquiller, G. E., & Abellon Jr, W. (2021). Teachers' problems in teaching mathematics using mother tongue in a district of the Philippines. In *Proceedings of the International Conference on Education*, 7(1), 430-436. <https://doi.org/10.17501/24246700.2021.7143>
- Beard, D. (2017). *Primary grade teachers' perceptions of parental involvement in school activities*. [Doctoral dissertation. Walden University]. <https://scholarworks.waldenu.edu/dissertations/4592>
- Beaver, N. H., Wyatt, S. S., & Jackman, H. L. (2018). *Early education curriculum: A child's connection to the world*. Cengage Learning.
- Benu, N. N. (2018). Code-switching in EFL classroom (A case study at a state senior high school in Kupang). *Exposure: Jurnal Pendidikan Bahasa Inggris*, 7(2), 150-160. <https://core.ac.uk/download/pdf/233602771.pdf>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Calvo, N., & Villarreal, Ó. (2018). Analysis of the growth of the e-learning industry through sustainable business model archetypes: A case study. *Journal of Cleaner Production*, 19(1), 26-39. <https://doi.org/10.1016/j.jclepro.2018.04.211>
- Chen, J. J.-L., & Rivera-Vernazza, D. E. (2022). Communicating digitally: Building preschool teacher-parent partnerships via digital technologies During COVID-19. *Early Childhood Education Journal*, 1-15. <https://doi.org/10.1007/s10643-022-01366-7>
- Copado, I. A., Brewster, A. L., Epstein, S. D., Brown, T., & Rodriguez, H. P. (2023). Collaborative learning among healthcare organizations to improve quality and advance racial equity. *Health Equity*, 7(1), 525-532. <https://doi.org/10.1089/heq.2023.0098>
- Cruikshank, M. (2024). Enhancing academic performance in primary schools: The crucial role of parental involvement. *International Journal of Science and Research*. <https://doi.org/10.21275/sr24107061204>

- Davids, R. (2015). *The leadership strategies that the school management team employs to improve academic learner performance at two disadvantaged primary schools in Soweto*. [Master's thesis. University of Johannesburg]. <https://search.proquest.com/openview/be8f9f95335548db27c0c5c81f6d58ba/1?pq-origsite=gscholar&cbl=2026366&diss=y>
- Diba, F., & Priyadarshini, A. (2023). Mother tongue education as a medium of instruction - A literature review. *International Journal For Multidisciplinary Research*. <https://doi.org/10.36948/ijfmr.2023.v05i06.9679>
- Epstein, L. G. (1987). A simple dynamic general equilibrium model. *Journal of Economic Theory*, 41(1), 68–95. [https://doi.org/10.1016/0022-0531\(87\)90006-8](https://doi.org/10.1016/0022-0531(87)90006-8)
- Esuong, U. U., Udo, O. F., & Effiong, I. A. (2024). The use of mother tongue in communicating mathematics: Implication for teaching and learning of mathematics. *British Journal of Education*. <https://doi.org/10.37745/bje.2013/vol12n24551>
- Gauteng Department Education. (2023) *Annual report 2023*. Retrieved August 1, 2025 from https://provincialgovernment.co.za/departement_annual/1351/2023-gauteng-education-annual-report.pdf
- Glottodidactica. (2023). Editorial. *An International Journal of Applied Linguistics*, 50(1), 7–13. <https://doi.org/10.14746/gl.2023.50.1.1>
- Gross, D., Bettencourt, A. F., Taylor, K., Francis, L., Bower, K., & Singleton, D. L. (2020). What is parent engagement in early learning? Depends who you ask. *Journal of Child and Family Studies*, 29:747–760. <https://doi.org/10.1007/s10826-019-01680-6>
- Hourani, R. B., Stringer, P., & Baker, F. (2012). Constraints and subsequent limitations to parental involvement in primary schools in Abu Dhabi: Stakeholders' perspectives. *The School Community Journal*, 22(2), 131–160
- Iwaniec, J. (2020). The effects of parental education level and school location on language learning motivation. *The Language Learning Journal*, 48(4), 427–441. <https://doi.org/10.1080/09571736.2017.1422137>
- Johnstone, R. (2018). Languages policy and English for young learners in early education. In S. Garton & F. Copeland (Eds.), *The Routledge handbook of teaching English to young learners*, (pp. 13-29). Routledge.
- Kaplan, I., & Bista, M. B. (2022). *Welcoming diversity in the learning environment: Teachers' handbook for inclusive education*. UNESCO. <https://doi.org/10.54675/UHWS5380>
- Lara, L., & Saracosti, M. (2019). Effect of parental involvement on children's academic achievement in Chile. *Frontiers in Psychology*, 1464. <https://doi.org/10.3389/fpsyg.2019.01464>
- Malindi, Z., Ndebele, C., & Gobingca, B. Z. (2023). Examining teachers' views on the adoption of mother tongue-based bilingual education in mathematics teaching and learning: A South African context. *South African Journal of Education*, 43(1). https://hdl.handle.net/10520/ejc-educat_v43_nsi2_a13
- Maluleke, M. J. (2019). Using code-switching as an empowerment strategy in teaching mathematics to learners with limited proficiency in English in South African schools. *South African Journal of Education*, 39(3). <https://doi.org/10.15700/saje.v39n3a1528>
- Mamedova, S., & Orosco, M. J. (2024). Culturally responsive mathematics: Characteristics in classroom settings. In G. Bennett & E. Goodall (Eds.). *The Palgrave Encyclopedia of Disability*. Palgrave Macmillan. https://doi.org/10.1007/978-3-031-40858-8_6-1
- Mashige, M., Cekiso, M., & Meyiwa, T. (2019). Foundation phase teachers' experiences with instruction in the mother tongue in the Eastern Cape. *South African Journal of Childhood Education*, 9(1), 1–10. <https://www.scielo.org/za/pdf/sajce/v9n1/54.pdf>

- Mokikwa, H., & Mokhele-Ramulumo, M. (2024). Navigating language diversity in multilingual stem classrooms: Strategies for inclusive education. *International Education Trend Issue*, 2(2), 92–106. <https://doi.org/10.56442/ieti.v2i2.421>
- Moshaba, P. O. N. (2020). *The experiences of teachers in the teaching of mathematics to grade 3 learners through mother tongue*. [Doctoral thesis, University of South Africa]. https://www.academia.edu/127745185/The_experiences_of_teachers_in_the_teaching_of_Mathematics_to_Grade_3_learners_through_Mother_Tongue
- Mphahlele, R. S., Manyaka, M. M., & Moshaba, P. O. N. (2022). Challenges in using African Languages as the language of learning and teaching (LoLT) for mathematics in schools: Foundation phase teachers' perspectives. *Journal of Mathematics Education at Teachers College*, 13(2). <http://doi.org/10.52214/jmetc.v13i12.9451>
- Ndlovu, N. G. (2023). *Parent-teacher collaboration in teaching Grade 3 mathematics using cell phones at a selected school in Mpumalanga*. [Master's thesis University of Mpumalanga]. <https://openscholar.ump.ac.za/bitstream/20.500.12714/792/1/Ndlovu-Gift-Nikiwe-220234728.pdf>
- Prinsloo, C. H., & Harvey, J. C. (2020). The differing effect of language factors on science and mathematics achievement using TIMSS 2015 data: South Africa. *Research in Science Education*, 50(6), 2207–2226. <https://doi.org/10.1007/s11165-018-9769-9>
- Ramothwala, T., Mandende, I. P., & Cekiso, M. (2024). Exploring the possibility of using Xhosa as a medium of instruction: Teachers and subject advisors' perspectives. *Journal of Intercultural Communication*, 119–128. <https://doi.org/10.36923/jicc.v24i3.895>
- Saldaña, J. (2021). Coding techniques for quantitative and mixed data. In A. J. Ongwuebuzi & R. B. Johnson (Eds.), *The Routledge reviewer's guide to mixed methods analysis* (pp.151-160). Routledge.
- Smith, T. E., Reinke, W. M., Herman, K. C., & Huang, F. (2019). Understanding family-school engagement across and within elementary- and middle-school contexts. *School Psychology*, 34(4), 363. <https://doi.org/10.1037/spq0000290>
- Tan, C. Y., Lyu, M., & Peng, B. (2020). Academic benefits from parental involvement are stratified by parental socioeconomic status: A meta-analysis. *Parenting*, 20(4), 241–287. <https://doi.org/10.1080/15295192.2019.1694836>
- Thomas, V., Muls, J., De Backer, F., & Lombaerts, K. (2020). Middle school student and parent perceptions of parental involvement: Unravelling the associations with school achievement and well-being. *Educational Studies*, 46(4), 404–421. <https://doi.org/10.1080/03055698.2019.1590182>
- Van Der Berg, S., Spaul, I. N., Wills, G., Gustafsson, M., & Kotzé, J. (2016). *Identifying binding constraints in education*. <http://dx.doi.org/10.2139/ssrn.2906945>
- Visser, M. M., Hannan, S. M., & Juan, A. L. (2019). Early learning experiences, school entry skills and later mathematics achievement in South Africa. *South African Journal of Childhood Education*, 9(1), 1–9. <https://hdl.handle.net/10520/EJC-15796ffa22>
- Wildmon, M. E., Anthony, K., & Kamau, Z. (2024). Identifying and navigating the barriers of parental involvement in early childhood education. *Current Issues in Education*. <https://doi.org/10.14507/cie.vol25iss1.2146>
- Zierer, K. (2021). Effects of pandemic-related school closures on pupils' performance and learning in selected countries: A rapid review. *Education Sciences*, 11(6), 252. <https://doi.org/10.3390/educsci11060252>
- Zou, X. (2023). The impact of parents' education level and occupation on their children's educational planning, educational resource provision, and family education practices. *Lecture Notes in Education Psychology and Public Media*, 2(1), 368–372. <https://doi.org/10.54254/2753-7048/2/2022286>