

INCLUSIVE MATHEMATICS TEACHING IN PRIMARY SCHOOLS: ISSUES AND CHALLENGES

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ABSTRACT

Inclusive mathematics teaching aims to integrate students with special educational needs (SEN) and mainstream learners in the same classroom to ensure equitable access to education. Despite policy efforts in Malaysia through the Inclusive Education Programme (IEP), many Mathematics teachers still face significant challenges in catering to diverse student needs. This study employed a qualitative case study approach involving semi-structured interviews with ten primary school Mathematics teachers experienced in inclusive classrooms. Data were analysed using thematic analysis, guided by the Community of Inquiry (coi) framework, and validated through coder triangulation and member checking. The study identified five key challenges: managing diverse learning abilities, lack of pedagogical knowledge and inclusive resources, time constraints due to syllabus pressure, behavioural disruptions, and limited collaboration with support staff. These issues reveal gaps in professional preparedness and systemic support for inclusive practices. The findings highlight the urgent need for targeted teacher training, collaborative teaching models, and inclusive pedagogical strategies to ensure effective implementation. Embedding inclusive teaching within the coi framework can enhance teaching, cognitive, and social presence in classrooms. This study contributes to understanding the real-world challenges of inclusive mathematics teaching and calls for the development of a competency-based framework to support inclusive practices in Malaysian primary schools.

Keywords: Inclusive Mathematics, Teaching Challenges, Special Educational Needs (SEN), Primary Education, Teacher Competencies

INTRODUCTION

The The implementation of inclusive education has become a global priority, particularly under Sustainable Development Goal 4 (SDG 4), which emphasises inclusive and equitable quality education for all learners. In Malaysia, the Inclusive Education Programme (IEP) seeks to integrate students with special educational needs (SEN) into mainstream classrooms at all levels of schooling, including primary education (Special Education Division, 2018). Among all core subjects taught in school, Mathematics is often regarded as one of the most challenging, both for mainstream learners and those with learning difficulties (Gervasoni & Peter-Koop, 2020). The abstract, sequential, and language dependent nature of Mathematics often poses additional barriers for SEN students, particularly in inclusive settings where instruction must be differentiated to accommodate a wide range of learning abilities.

Despite progressive national policies advocating for inclusive practices, many primary school Mathematics teachers in Malaysia continue to face significant difficulties in implementing inclusive instruction effectively. Several studies have found that these teachers frequently lack pedagogical knowledge, training, and confidence to adapt instructional strategies to suit the individual needs of SEN students (Lin et al., 2021). In many cases, mainstream Mathematics teachers are unfamiliar with principles of special education, while resource teachers may lack sufficient content knowledge in Mathematics to provide adequate support (Bottge et al., 2018). Consequently, collaboration between general education and special education teachers is often limited and ineffective. In addition, ongoing challenges such as communication difficulties with students who have hearing impairments (Kompara et al., 2022), behavioural and emotional disruptions (Haris & Khairuddin, 2021), and a shortage of inclusive teaching resources and assistive technologies (Paliwal & Fain, 2020) further complicate inclusive Mathematics instruction. The lack of a structured pedagogical framework contributes to inconsistent teaching practices and exacerbates learning gaps among students.

In the current Malaysian educational context, several national developments underscore the urgency of addressing these persistent challenges in inclusive Mathematics instruction. The implementation of the Malaysia Digital Education Master Plan 2021–2025 (Ministry of Education Malaysia, 2021) and the National Policy for Persons with Disabilities 2023–2030 (Department of Social Welfare, 2023) reflect the government's commitment to promoting inclusive and technology-integrated learning environments. Recent data from the Ministry of Education (2023) revealed a nearly 19% increase in the enrolment of students in the IEP between 2020 and 2023, further intensifying the demand on teachers to implement inclusive pedagogical strategies. However, studies show that many mainstream Mathematics teachers still report feeling unprepared in terms of pedagogical content knowledge and inclusive practices (Makrof & Mahmud, 2025; Abdulah & Mahmud, 2024). Additionally, Mahmud et al. (2023) found that weak collaboration between mainstream teachers and special education support staff remains a major barrier to effective co-teaching and instructional planning in inclusive settings. These realities highlight the urgent need for more nuanced and localised research that captures the lived experiences of Mathematics teachers working in inclusive classrooms.

Therefore, this study aims to explore the real world challenges faced by primary school Mathematics teachers in implementing inclusive education. By identifying the instructional, behavioural, and systemic barriers encountered in inclusive settings, this study seeks to inform future policy, professional development, and the development of a competency-based framework for inclusive Mathematics instruction in Malaysian primary schools.

Research Objectives

- i.To explore the challenges experienced by primary school Mathematics teachers in implementing inclusive education practices.
- ii.To identify the pedagogical, behavioural, and systemic factors that affect the effectiveness of inclusive Mathematics teaching in primary schools.

Research Questions

- i.What are the main challenges faced by primary school Mathematics teachers in teaching students with special educational needs (SEN) in inclusive classrooms?
- ii.How do pedagogical knowledge, classroom management, and collaboration with support staff influence the delivery of inclusive Mathematics lessons?

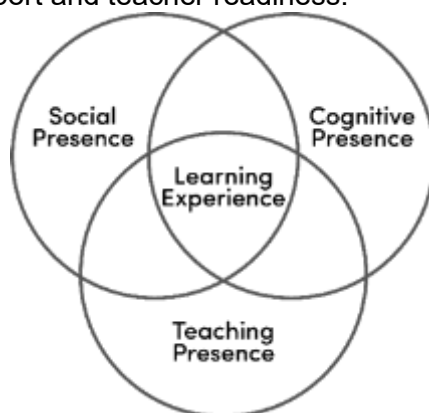
LITERATURE REVIEW

In the specific context of inclusive Mathematics education, teaching and learning activities must be carefully designed to accommodate the varying needs and readiness levels of all learners. Students with special educational needs (SEN) often require additional support in grasping abstract mathematical concepts and in building foundational skills essential for progression. Teachers are expected to deliver content that is accessible, engaging, and inclusive. However, many struggle due to insufficient pedagogical training, limited instructional resources, and tight curriculum schedules (Atoyebi & Atoyebi, 2022). In classrooms with wide-ranging abilities, mainstream Mathematics teachers frequently report challenges in managing behavioural issues and responding to cognitive differences among students (Hodgen et al., 2022). Research by Gervasoni and Peter-Koop (2020) and Bottge et al. (2018) further reveals that SEN students often face compounded difficulties due to misalignments between national curriculum standards and their actual learning capabilities.

To support effective inclusive instruction, the Malaysian Special Education Division (2018) recommends multiple forms of support, including resource teachers, adaptive teaching materials, specialised tools, and an inclusive-friendly learning environment. Nonetheless, collaboration between resource teachers and Mathematics teachers is often fragmented. Kalogeropoulos et al. (2020) found that many mainstream teachers feel underprepared for inclusive teaching due to the absence of formal training and planning time with support staff. Moreover, while the use of assistive technologies such as screen readers, visual manipulatives, and adaptive software has proven beneficial (Kramarenko et al., 2021), these resources are not consistently available or fully utilised in many inclusive classrooms, further widening the equity gap.

While much of the literature affirms the value of inclusive education, some scholars have critically highlighted its limitations. For example, Adams and Julius (2024) argue that inclusive leadership practices in Malaysian schools remain uneven and often symbolic, with limited practical translation in classroom strategies. Obah (2024) further notes that the ambitious goals of inclusive education are frequently undermined by systemic constraints such as negative teacher attitudes, inadequate school-level planning, and lack of training. These critiques suggest

that despite favourable policies, inclusive teaching may not lead to improved learning outcomes without strong institutional support and teacher readiness.



To provide a more structured understanding of how inclusive Mathematics teaching can be improved, this study adopts the Community of Inquiry (CoI) framework developed by Garrison, Anderson, and Archer (2000). The CoI framework comprises three interdependent elements: teaching presence, which refers to instructional design and facilitation; cognitive presence, which addresses learners' engagement in constructing meaning through inquiry; and social presence, which focuses on developing a respectful and supportive learning environment (Garrison, 2017). When applied to inclusive Mathematics instruction, the CoI framework provides a useful analytical lens to explore how teachers design inclusive learning experiences, manage student understanding, and create emotionally safe classroom communities. This theoretical underpinning enables the study to examine inclusive teaching not only from a pedagogical perspective but also through the cognitive and affective dynamics that influence teaching effectiveness.

In summary, the literature indicates that while inclusive education has gained policy momentum, practical implementation particularly in Mathematics remains fraught with challenges. The combined issues of curriculum demands, lack of training, resource gaps, and weak collaboration mechanisms continue to affect the equitable delivery of Mathematics instruction in inclusive classrooms. These complexities justify the need for the present study, which aims to explore these issues through the CoI framework and offer insights into the competencies and structural supports required to enhance inclusive Mathematics teaching in Malaysian primary schools.

METHODOLOGY

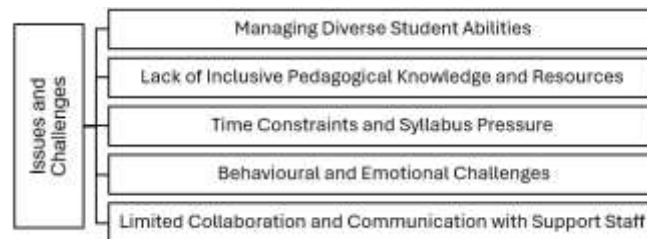
This qualitative study involved ten mathematics teachers from primary schools under the jurisdiction of the Sentul District Education Office (PPD Sentul), selected through purposive sampling based on their experience teaching students with special educational needs (SEN) in inclusive classrooms under the Inclusive Education Programme (IEP). Semi-structured interviews were conducted using a protocol developed based on the Community of Inquiry (CoI) framework by Garrison, Anderson, and Archer (2000), encompassing teaching presence, cognitive presence, and social presence. The protocol aimed to explore instructional practices, communication strategies, and support mechanisms used when teaching mathematics to SEN

students. To ensure the validity of the instrument, face validity was established by consulting three inclusive education researchers to evaluate the clarity and appropriateness of the interview questions. Content validity was verified by two experts in mathematics and special education who reviewed the relevance and alignment of items with the Col framework and inclusive teaching constructs. Additionally, member checking was conducted by returning interview transcripts to participants for verification to ensure the accuracy and credibility of the data. All interviews were audio-recorded with informed consent and transcribed verbatim. The data were analysed using the constant comparative method to identify emerging themes, supported by Atlas.ti version 9 for systematic coding and categorisation. This analytical process enabled the identification of key challenges and teacher competencies related to inclusive mathematics instruction in Malaysian primary schools.

RESULTS AND FINDING

Thematic analysis of the interview data revealed five major challenges experienced by primary school Mathematics teachers in implementing inclusive education. These themes reflect both instructional and systemic barriers that directly impact teaching effectiveness and student learning outcomes.

Figure 1: Issues and challenges of Mathematics Teaching in Inclusive Primary Setting



Managing Diverse Student Abilities

One of the most prominent challenges shared by participants was the difficulty in managing classrooms with students at significantly different levels of mathematical understanding. Teachers explained that inclusive students often struggle with basic number recognition and simple operations, while mainstream students are expected to meet standard curriculum outcomes. As a result, teachers are forced to conduct dual-level instruction simultaneously, which demands additional time, planning, and energy.

Teacher A: *“In one class, some students can do addition up to 1000, but the inclusive students are just starting to recognise numbers from one to ten.”* [P105]

Teacher C: *“I’m teaching two different levels in one classroom, and that slows down the progress for everyone.”* [P108]

Teacher G: *“Some SEN students can only respond with gestures. I need to use visual cues, while the others are already working on written problems.”* [P110]

Lack of Inclusive Pedagogical Knowledge and Resources

Many teachers reported that they lacked adequate training and pedagogical knowledge for planning and delivering inclusive Mathematics lessons. They often relied on their own judgment, recycled mainstream materials, or improvised approaches to accommodate SEN students. The absence of formal guidelines and accessible teaching aids made it difficult for them to cater to various learning styles.

Teacher B: *"I don't really know how to write a proper lesson plan for inclusive students."* [P115]

Teacher D: *"There's no guidebook or training module for inclusive Maths. I just use what I have."* [P118]

Teacher H: *"I feel unsure whether my teaching really helps the SEN students. I'm not confident about the strategies I use."* [P121]

Teachers also emphasized the need for manipulatives, visual materials, and differentiated content to better support learners with cognitive delays or visual impairments.

Time Constraints and Syllabus Pressure

Teachers expressed concern about the pressure to complete the national syllabus on schedule, even when some students particularly those in inclusive programs require more time and repetition to master foundational skills. The tight pacing of the curriculum often prevents them from slowing down or revisiting content, leading to stress and feelings of guilt.

Teacher A: *"Sometimes I feel bad because the inclusive student hasn't grasped addition, but I have to move on to subtraction to follow the syllabus."* [P125]

Teacher E: *"I want to repeat the lesson, but there just isn't enough time in one period."* [P127]

Teacher F: *"There's just not enough time to give them the repetition they need."* [P130]

Some teachers highlighted the mismatch between curriculum expectations and the actual readiness of their SEN students, further complicating the teaching process.

Behavioural and Emotional Challenges

Behavioural and emotional issues among SEN students also emerged as a significant challenge. Teachers shared experiences of students having sudden meltdowns, shouting, or showing aggressive behaviors when they did not understand the content. These incidents disrupted the learning process and required individual attention from the teacher, affecting the rest of the class.

Teacher C: *"When they don't understand, some students cry or throw things, and I have to stop the lesson to calm them."* [P135]

Teacher G: *"Their tantrums affect the rest of the class. Sometimes I don't even get to finish my teaching."* [P138]

Teacher H: *"Sometimes I have to pause the lesson entirely to calm down a SEN student who is having a meltdown."* [P140]

Teachers also noted that such emotional strain, coupled with limited support, contributed to their own mental fatigue and feelings of helplessness.

Limited Collaboration and Communication with Support Staff

Several participants revealed that collaboration between mainstream Mathematics teachers and resource teachers was limited. Due to tight schedules and lack of allocated co-planning time, most teachers worked independently when handling SEN students in inclusive classrooms. This lack of coordination often led to fragmented support and inconsistent instructional strategies.

Teacher D: *"I rarely get to meet with the resource teacher. We're both too busy."* [P145]

Teacher E: *"There's no proper time set aside for us to plan together. We just work separately most of the time."* [P148]

Teacher I: *"If we had more planning time together, I could align my teaching better to the student's needs."* [P150]

This isolation made it difficult for teachers to implement meaningful inclusive practices and share expertise across disciplines.

In summary, the findings of this study highlight five key challenges that significantly affect the implementation of inclusive Mathematics teaching in primary schools: managing diverse student abilities, lack of pedagogical knowledge and resources, time constraints due to syllabus pressure, behavioural and emotional disruptions, and limited collaboration with support staff. These issues reflect the multifaceted realities faced by teachers in inclusive classrooms, where they are expected to address a wide spectrum of learning needs with limited training and support. The data clearly indicates that without structured guidance, collaborative frameworks, and adequate resources, inclusive Mathematics instruction remains difficult to sustain effectively. These challenges underscore the urgent need for systemic interventions that empower teachers with the necessary competencies, tools, and time to deliver equitable Mathematics education for all learners.

DISCUSSIONS AND CONCLUSIONS

This study uncovered five critical challenges encountered by primary school Mathematics teachers in implementing inclusive education: diverse student abilities, lack of pedagogical knowledge and resources, time constraints, behavioural disruptions, and limited collaboration with support staff. These challenges reflect not only pedagogical limitations but also broader systemic gaps that undermine the equity and quality of Mathematics instruction in inclusive settings.

Managing students with varying cognitive and academic abilities remains one of the most pressing concerns. Teachers must cater to both high-achieving students and those struggling with foundational skills, often within the same lesson. As highlighted by Gervasoni and Peter-Koop (2020), students with learning disabilities experience greater difficulty in Mathematics due to their limited working memory, processing speed, and conceptual understanding, requiring more time and scaffolding than mainstream learners. The strain of such diversity affects the teacher's ability to maintain balanced instruction for all.

The lack of pedagogical content knowledge in inclusive contexts was another major theme. Many teachers are unfamiliar with the principles of Universal Design for Learning (UDL),

adaptive strategies, or differentiated instruction specific to SEN learners (Roos, 2019; Mehta & Panju, 2018). This aligns with the findings of Makrof and Mahmud (2025), who reported that most mainstream Mathematics teachers in Malaysia feel unprepared for inclusive teaching due to inadequate pre-service and in-service training. This deficiency reduces the effectiveness of the cognitive presence component in the Community of Inquiry (CoI) framework, which is essential in helping students make meaning through guided learning (Garrison et al., 2000).

Time constraints and syllabuses further aggravate the situation. Salleh and Omar (2018) explain that teachers are often pressured to complete the syllabus on time, leading to neglect of inclusive practices that require slower pacing and repetition. Teachers in this study echoed this concern, noting the conflict between policy expectations and practical classroom realities. Behavioural and emotional challenges such as frequent outbursts or disengagement—were also frequently cited. Haris and Khairuddin (2021) noted that teachers need specialised behavioural management strategies to support inclusive learners effectively. Without such skills, teachers often experience burnout or disengagement themselves, eroding the social presence necessary to build a sense of community and connection among students (Garrison, 2017).

Lastly, limited collaboration between subject teachers and resource teachers weakens support continuity. Kalogeropoulos et al. (2020) argue that strong co-teaching and team planning models are key to inclusive success, yet such collaboration is rarely practised in Malaysian schools. When teachers work in silos, the teaching presence involving instructional design and facilitation becomes inconsistent and unsustainable. Overall, these findings point to an urgent need for a structured competency framework for inclusive Mathematics instruction, supported by continuous professional development, access to appropriate teaching aids, and time for collaborative planning. Embedding the principles of the Community of Inquiry teaching presence, cognitive presence, and social presence can provide a holistic model to guide inclusive practices and support both teacher and learner development.

Conclusions

This study provides valuable insights into the multifaceted challenges faced by primary school Mathematics teachers in implementing inclusive education. The findings identified five key issues: diverse student abilities, lack of pedagogical knowledge and teaching resources, time constraints and syllabus pressure, behavioural and emotional challenges, and limited collaboration with support staff. These challenges not only hinder the quality of teaching and learning in inclusive Mathematics classrooms but also place an overwhelming burden on teachers who are already stretched in their efforts to provide equitable instruction.

Despite national efforts to promote inclusive education, such as through the Inclusive Education Programme (PPI), the reality in classrooms remains complex and demanding. Many teachers are left to navigate these challenges without adequate training, guidance or support systems. The disconnect between policy aspirations and classroom implementation underscores the need for structural reform, particularly in equipping teachers with practical strategies, flexible instructional models, and sufficient support to address the varied needs of all learners.

Grounding inclusive teaching practices within a theoretical framework such as the *Community of Inquiry (CoI)* can provide a clearer direction for teachers. Enhancing *teaching presence*, *cognitive presence*, and *social presence* can improve the effectiveness of instruction and promote meaningful learning experiences for both mainstream and SEN students. Therefore,

this study calls for the development of a competency-based framework and structured support systems tailored to inclusive Mathematics teaching. Such efforts are critical to realising the true goal of inclusive education ensuring that every child, regardless of ability, has the opportunity to succeed in Mathematic.

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