Jurnal Cakrawala Pendas
Vol. 9 No. 4, Oktober 2023
DOI: http://dx.doi.org/10.31949/jcp.v9i4.6384

p-ISSN: 2442-7470
e-ISSN: 2579-4442

TEACHERS' PERSPECTIVES ON OBSTACLES AND SOLUTION STRATEGIES IN MATHEMATICS TEACHING IN INCLUSIVE ELEMENTARY SCHOOL CLASSES

Susilo Hadi[1*], Dudu Suhandi Saputa[2], Reza Rachmadtullah[3], Budi Febriyanto[4]
[1,3]Universitas PGRI Adi Buana Surabaya
[2]Universitas Majalengka
[4]Universitas Pendidikan Indonesia
[1]susilohadi45@gmail.com

Abstract
This study aims to identify the challenges faced by teachers in teaching mathematics in inclusive elementary school classrooms and the solution strategies implemented to overcome these challenges. Teaching mathematics in inclusive classrooms involves students with diverse abilities, including students with special needs, which complicates the learning process. The research method used was descriptive qualitative, with data collected through in-depth interviews and observations of several teachers teaching in inclusive elementary school classrooms. The results indicate that the main challenges faced by teachers include differences in academic ability levels among students, limited resources, complex classroom management, difficulties in managing the behavior of students with special needs, and a lack of adequate training and support for teachers. Teachers face challenges in adapting teaching materials and teaching methods to meet the diverse needs of students, which impacts learning effectiveness. Furthermore, limited access to appropriate tools and technology is also a hindering factor. To overcome these challenges, teachers implement various solution strategies, such as using more flexible teaching methods and collaborating with support staff and specialists to provide more attention to students with special needs.
Keywords: *Mathematics Teaching; Inclusive Education; Elementary School.*

Abstrak
Penelitian ini bertujuan untuk mengidentifikasi kendala yang dihadapi oleh guru dalam pengajaran matematika di kelas inklusif Sekolah Dasar (SD) serta strategi solutif yang diterapkan untuk mengatasi kendala tersebut. Pengajaran matematika di kelas inklusif melibatkan siswa dengan beragam kemampuan, termasuk siswa dengan kebutuhan khusus, yang membuat proses pembelajaran lebih kompleks. Metode penelitian yang digunakan adalah kualitatif deskriptif, dengan pengumpulan data melalui wawancara mendalam dan observasi terhadap beberapa guru yang mengajar di kelas inklusif SD. Hasil penelitian menunjukkan bahwa kendala utama yang dihadapi guru meliputi perbedaan tingkat kemampuan akademik antara siswa, keterbatasan sumber daya, manajemen kelas yang kompleks, kesulitan dalam mengelola perilaku siswa dengan kebutuhan khusus, serta kurangnya pelatihan dan dukungan yang memadai bagi guru. Guru menghadapi tantangan dalam menyesuaikan materi ajar dan metode pengajaran untuk memenuhi kebutuhan beragam siswa, yang mempengaruhi efektivitas pembelajaran. Selain itu, keterbatasan alat bantu dan teknologi yang disesuaikan juga menjadi faktor penghambat. Untuk mengatasi kendala tersebut, guru menerapkan berbagai strategi solutif, seperti penggunaan metode pengajaran yang lebih fleksibel, serta bekerja sama dengan tenaga pendukung dan spesialis untuk memberikan perhatian lebih pada siswa dengan kebutuhan khusus.
Kata Kunci: Pengajaran matematika; Pendidikan Indklsi; Sekolah Dasar

Received	: 2023-08-28	Approved	: 2023-10-30
Reviesed	: 2023-10-29	Published	: 2023-10-31

Introduction

Inclusive education in Indonesia has become a crucial focus in improving the quality of education for all students, including those with special needs (Kawai, King & Hui, 2023). In the context of mathematics teaching, the role of teachers is crucial in creating a learning environment that supports diversity. However, despite numerous efforts to implement inclusive education, mathematics teaching in inclusive classrooms still faces various obstacles. These obstacles are often related to differences in student abilities, limited resources, and a lack of teacher training and preparedness in implementing effective learning strategies for all students (Rachmawati, 2019).

Inclusive education in Indonesia, particularly mathematics teaching in inclusive classrooms at the elementary school level, has received growing attention in academic literature. Inclusive education aims to provide equal opportunities for all students, including those with special needs, to learn together in a classroom with other students (Rasmitadila, Humaira & Rachmadtullah, 2021). In this context, mathematics teaching presents a unique challenge, as it requires an approach that accommodates students' differing abilities. Several recent studies have shown that the biggest obstacles teachers face in teaching mathematics in inclusive classrooms are differences in student ability levels and a lack of teacher training and preparedness to address this diversity (Mardiana, 2020; Jannah, 2021).

The main obstacles teachers face in implementing mathematics teaching in inclusive classrooms include limited adaptive teaching materials, a lack of supporting technology, and a lack of collaboration between classroom teachers and assistant teachers (Kurniawati, 2021). Teachers also often lack adequate training to handle students with special needs, resulting in less than optimal curriculum adaptation and learning strategies (Sari & Yulianto, 2020). On the other hand, learning differentiation has been identified as a potential approach to addressing student diversity in inclusive classrooms, where teachers can provide material tailored to individual student needs (Astuti, 2022; Rachmawati & Dini, 2022).

Although numerous studies have examined the challenges of inclusive education, few have specifically addressed mathematics teaching at the elementary school level. This is important because mathematics requires a different teaching approach compared to other subjects, especially in the context of inclusive classes consisting of students with highly diverse academic abilities (Novianti & Suryani, 2021; Fitriani & Hidayat, 2020). Furthermore, previous research has shown that teachers' attitudes and mental readiness play a crucial role in the success of inclusive learning, where a thorough understanding of the characteristics of students with special needs is essential (Zahra & Sumarni, 2023; Fitria & Setiawati, 2022). Research conducted by Wulandari (2022) revealed that adapting mathematics learning for students with special needs, such as providing teaching aids or using assistive technology, is an effective solution to help students understand mathematical concepts. However, the biggest challenge is limited resources, both in terms of adaptive teaching materials and inadequate teacher training to address student diversity (Rosyid, 2021).

This study aims to identify the main obstacles faced by teachers in teaching mathematics in inclusive classes and explore solution strategies that have been or could be implemented to improve teaching effectiveness. By understanding these two aspects, this research is expected to significantly contribute to the development of educational policies, teacher training, and the development of more inclusive teaching materials. The results are also expected to serve as a reference for developing learning environments that are more responsive to student needs, thereby supporting the successful implementation of inclusive education in Indonesia.

Jurnal Cakrawala Pendas Vol. 9, No. 4, Oktober 2023, pp. 775-783

Research Methods

This study used a qualitative approach with a descriptive design. The qualitative approach was chosen because the goal was to explore and understand in-depth the views, experiences, and perspectives of teachers regarding the challenges faced in teaching mathematics in inclusive elementary school classrooms and the solution strategies they employ to overcome these challenges. This approach allowed researchers to obtain more holistic information regarding the challenges and solutions in teaching mathematics in inclusive classrooms, involving students with various special needs and regular students. This study used a descriptive design to describe in detail the phenomena that exist in teaching mathematics in inclusive classrooms, with an emphasis on the challenges faced by teachers and the solution steps they implement. This is a qualitative descriptive study, aiming to describe and analyze the challenges faced by teachers in teaching mathematics in inclusive elementary school classrooms, as well as the solution strategies implemented to overcome these challenges. With this approach, this study focuses on an in-depth explanation of the problems teachers face, how they address them, and why certain strategies are chosen.

The respondents to this study were teachers who teach mathematics in inclusive elementary school classrooms. Respondents were selected using a purposive sampling technique, with the criteria being teachers who had taught in inclusive classes for at least two years. Five public elementary school teachers from Surabaya City were selected.

Data collected from interviews and observations will be analyzed using thematic analysis. The following are the stages in the data analysis process: (1) Data Transcription: All interviews will be transcribed verbatim to ensure the data obtained is accurate and complete. (2) Coding: After transcription, the researcher will code the data, assigning labels or codes to relevant data segments. Each code will reflect a key theme related to the challenges and solutions implemented by the teachers. (3) Theme Identification: The coded data will be analyzed to identify key themes related to the challenges faced by the teachers and the solution strategies they implemented. These themes may include classroom management issues, differences in student abilities, technology use, and resource limitations. (4) Data Categorization: The themes found will be grouped into larger categories to facilitate understanding of the main challenges faced by teachers in teaching mathematics in inclusive classes. (5) Data Triangulation: To ensure the validity of the findings, data triangulation will be carried out by comparing data from interviews and observations and referring to relevant literature. This will ensure that the data obtained is not only accurate but also consistent.

Result and Discussion

The results of this study indicate that time management is a major obstacle to learning in inclusive classrooms. Limited class time is often a major challenge for teachers managing classrooms with diverse students, both in terms of academic ability and special needs. In inclusive classrooms, teachers must provide individual attention to each student, requiring more time to explain material in depth, adapt learning to suit their abilities, and provide the support needed by students with special needs. This results in insufficient time for effective learning for all students. Furthermore, inability to manage time also reduces students' opportunities to complete assignments optimally, ultimately impacting their learning outcomes.

One of the main challenges in teaching mathematics in inclusive classrooms is the difference in academic ability between students with special needs and regular students.

Students with special needs, such as intellectual disabilities, dyslexia, or autism, often have difficulty understanding more abstract or complex mathematical concepts. The difference in academic ability between students with special needs and regular students is one of the main challenges in inclusive education. Students with special needs, such as intellectual disabilities, dyslexia, or autism spectrum disorder, often struggle to understand and master subject matter in the same way as regular students.

They may take longer to grasp basic concepts, such as mathematical operations or problem-solving, which can leave them behind if teaching methods are not tailored to their needs. Conversely, regular students are generally able to pick up lessons more quickly because they don't face the same barriers in cognitive or physical abilities. Therefore, teachers in inclusive classrooms must be able to recognize these differences and adapt their teaching methods to ensure that every student, both regular and special needs, can optimally understand the material. These adjustments can include the use of visual aids, providing clearer and more repetitive instructions, and employing a more varied teaching approach to make mathematics learning more inclusive and effective for all students.

Based on interviews with teachers regarding Challenges in Teaching Mathematics in Inclusive Classrooms.

Salah satu faktor kendala yaitu perbedaan kemampuan akademik yang sangat signifikan antara siswa reguler dan siswa dengan kebutuhan khusus. karena dalam merancang pembelajaran yang dapat mengakomodasi semua siswa secara efektif (responden 1)

Perbedaan kemampuan ini sering kali menyebabkan kesulitan bagi guru dalam merancang pembelajaran yang dapat mengakomodasi semua siswa secara efektif. Guru harus mampu menyesuaikan metode, strategi, dan materi pembelajaran untuk memenuhi kebutuhan individu, tanpa meninggalkan satu pun siswa di belakang (responden 2)

Furthermore, the challenges of managing inclusive education in the classroom often pose a significant challenge for educators, particularly due to the diverse nature of inclusive classes, which involve students with varying academic, physical, social, and emotional needs. Inclusive education aims to provide equal opportunities for all students, including those with special needs, to learn in the same environment as regular students. Classroom management in inclusive classes becomes more complex because teachers must manage students with diverse backgrounds and needs. Students with special needs often require more attention, while regular students also require appropriate instruction to promote their progress. Teachers need to find a balance between paying attention to students with special needs and ensuring that other students do not feel neglected. This often increases the workload of teachers, who must maintain a classroom environment conducive to all students. In inclusive classes, there are students with various conditions, including those with physical disabilities, intellectual disabilities, or other learning disabilities. These differences in ability require teachers to adapt their teaching methods and provide more attention to students with special needs, which requires additional time and effort.

The following is an interview with respondents regarding issues related to inclusive classroom management in elementary schools:

"Disekolah saya para guru masih mengalami pemahaman dalam menerapkan pendidikan inklusi walaupun kami di wajibkan menerima siswa berkebutuhan khusus namun pengetahuan kami untuk mengangani ini masih terbatas" (Responden 3)

"Saya sendiri kadang mengalami dalam memanajemen kelas inklusi karena guru pendamping/pembantu yang memiliki keilmuan pendidikan khusus masih jarang. kami bisanya meminta bantu guru bimbingan

Jurnal Cakrawala Pendas Vol. 9, No. 4, Oktober 2023, pp. 775-783

konsling jika mengalami kendala dalam menghadapi siswa berkebutuhan khusus. walapun masih memiliki kendala kami selama ini dapat mengatasinya kebetulan pihak sekolah kami bekerjasama dengan orang tua murid sama-sama peduli terhadap siswa yang memiliki kebutuhan khusus, bahkan kami juga mendapatkan relawan untuk membantu kamu". (Reponden 4)

To address classroom management issues in inclusive classrooms, teachers need to develop skills in differentiated learning, behavior management, and the more flexible use of learning technology. Ongoing education and training for teachers on inclusive classroom management techniques, such as the use of a student-centered approach, is crucial. Furthermore, improved collaboration between classroom teachers and support staff, as well as the effective use of existing resources, can help create a more inclusive and supportive learning environment for all students.

Teaching mathematics in inclusive classrooms requires careful adaptation to student diversity, both in terms of academic ability and the special needs of some students. One approach considered highly effective is differentiated instruction. In this approach, teachers adjust teaching strategies to meet the needs of diverse students in different ways. Tomlinson (2014) explains that differentiated instruction involves modifications in the content, process, and product of learning based on students' ability levels and learning styles. For example, for students who have difficulty understanding abstract concepts, teachers can use visual aids such as pictures or concrete objects to help them understand the mathematics material more easily. Differentiated learning enables all students, both those with high abilities and those requiring special attention, to develop according to their individual potential.

Furthermore, technology-based approaches have proven effective in supporting mathematics teaching in inclusive classrooms. The use of technology-based educational software and applications offers numerous benefits, especially for students with special needs. Miller and Baumer (2019) revealed that technology can help overcome learning barriers by providing visualizations, interactive exercises, and real-time feedback that can be adjusted to the student's learning pace. Technological aids, such as graphing calculators or app-based math learning tools, can help students with disabilities learn more independently and at their own pace. This technology also facilitates access to a wider range of resources and provides alternative ways to convey complex mathematical concepts.

Multisensory approaches also play a crucial role in creating inclusive mathematics learning. In inclusive classrooms, using learning methods that engage more than one sense can help enhance student understanding. These techniques utilize visualization, touch, sound, and even body movement to reinforce mathematical concepts. For students with hearing or visual impairments, learning using physical aids, math manipulatives, or devices that convert visual information into sound or vibrations can provide new ways to understand mathematics (Stewart, 2017). These techniques increase student engagement in learning and facilitate better understanding by simultaneously stimulating multiple sensory channels.

In addition to these techniques, the use of collaborative learning can address several challenges in teaching mathematics in inclusive classrooms. This teaching model encourages students to work together, share knowledge, and help one another. Friend and Bursuck (2020) explain that peer tutoring, where more able students help their less able peers, can be an effective solution in inclusive classrooms. Through this model, students not only receive direct assistance from the teacher but also learn in a more interactive and collaborative way. In addition to improving understanding of mathematical concepts, this model also builds a sense of social responsibility and empathy among students.

Effective classroom management is also a crucial aspect of teaching mathematics in inclusive classrooms. In classrooms with students with diverse abilities and needs, teachers must be able to efficiently manage time, assignments, and interactions between students. One way to ensure good classroom management is to establish clear routines and learning structures that enable active student participation. Clear instructions and flexible classroom space can support a variety of learning activities tailored to student needs (Sparks, 2019). Implementing responsive classroom management strategies will create a supportive environment, enabling students with special needs to feel more comfortable and engaged in the learning process.

Furthermore, developing teachers' professional competencies is also essential for implementing these solutions effectively. Teachers need to be provided with adequate training on inclusive teaching techniques, especially in the context of mathematics, which is often considered difficult by most students. One way to do this is through workshops or ongoing training specifically designed to equip teachers with the skills to adapt teaching materials and methods for students with special needs (Sharma et al., 2018). This training can help teachers better understand the needs of students with learning disabilities and introduce them to more effective strategies for addressing challenges in inclusive classrooms.

This study focuses on the challenges faced by teachers in teaching mathematics in inclusive elementary school classrooms and the solution strategies they use. The findings indicate that there are various challenges in inclusive classroom management that affect the effectiveness of mathematics teaching. Some of the main challenges identified in this study include the diversity of academic abilities between regular students and students with special needs, and the obstacles to inclusive education management in the classroom. One of the biggest obstacles to teaching mathematics in inclusive classrooms is the diversity of students' academic abilities. Students with special needs, such as learning disabilities, autism spectrum disorder (ASD), and intellectual disabilities, require a more individualized and focused teaching approach (Sari, 2022). On the other hand, regular students tend to have better academic abilities, which leads to differences in levels of understanding in the mathematics taught. As a result, teachers are faced with the challenge of balancing teaching by providing adequate attention to all students. This is in line with research conducted by Hehir et al. (2020), which shows that differences in academic abilities in inclusive classrooms require effective learning differentiation strategies to ensure that all students can understand the material being taught. One of the main challenges in inclusive classroom management is managing the diversity of student abilities, both academically and socially and emotionally. Research by Sari (2022) states that significant differences between regular students and students with special needs can impact classroom interactions and the learning process. Teachers in inclusive classrooms need to develop skills to manage these differences in a way that allows each student to receive attention tailored to their needs. Differentiation of instruction, such as assigning customized assignments or using a variety of teaching methods, is one strategy that can be used to manage this diversity. Research by Billingsley (2020) shows that the success of inclusive classroom management is greatly influenced by effective collaboration between classroom teachers and support staff, such as special needs teachers and therapists. Good collaboration can strengthen learning plans that are tailored to student needs, optimize resource use, and help overcome classroom management challenges. In this context, research by Clarke et al. (2021) emphasizes the crucial role of special needs teachers and therapists in supporting students with special needs, both in managing behavior and in providing necessary additional support.

Conclusion

This study identifies and analyzes obstacles and solution strategies in teaching mathematics in inclusive elementary school classrooms. Based on the findings, it can be concluded that the main challenges in inclusive classroom management include the diversity of students' academic abilities, difficulties in managing behavior, time constraints, and the need for more and more appropriate resources. Although there are significant differences between regular students and students with special needs, appropriate strategies, such as learning differentiation, the use of educational technology, and a more individualized approach to students with special needs, can help create a more inclusive and effective learning environment. Furthermore, good collaboration between classroom teachers and other support staff is crucial to improving the quality of teaching and supporting students with special needs in achieving optimal learning goals. This study also highlights the need for further training for teachers on inclusive classroom management and the use of more flexible and adaptive teaching techniques.

References

Alnahdi, G. H. (2019). A review of inclusive education in Saudi Arabia: Benefits, challenges, and strategies. International Journal of Special Education, 34(1), 45-59.

Astuti, T. (2021). Diferensiasi pembelajaran dalam kelas inklusif: Pendekatan untuk mengakomodasi kebutuhan siswa. Jurnal Pendidikan Dasar Indonesia, 13(4), 245–259.

Billingsley, B. S. (2020). Collaboration in inclusive classrooms: Approaches for teacher success. Teaching Exceptional Children, 53(5), 310-322.

Clarke, B., Johnson, R., & Lee, S. (2021). Managing behavior in inclusive classrooms: Effective strategies for teachers. Educational Psychology Review, 33(1), 43-61.

Fitria, R., & Setiawati, N. (2022). Peran Guru dalam Meningkatkan Pembelajaran Matematika di Kelas Inklusif. Jurnal Pendidikan Anak Berkebutuhan Khusus, 5(3), 18-28.

Fitriani, E., & Hidayat, A. (2020). Kesiapan Guru dalam Pengajaran Matematika di Kelas Inklusif. Jurnal Pendidikan dan Pembelajaran, 15(2), 37-47.

Friend, M., & Bursuck, W. D. (2020). Including students with special needs: A practical guide for classroom teachers. Pearson.

Hall, T., & Strangman, N. (2016). Differentiated instruction and the universal design for learning: A framework for teaching mathematics. Journal of Learning Disabilities, 47(1), 17-27.

Hehir, T., Schifter, L., & Grindal, T. (2020). The impact of inclusive education on student outcomes: A review of the literature. International Journal of Special Education, 35(2), 85-101.

Heward, W. L. (2017). Exceptional children: An introduction to special education. Pearson.

Jannah, N. (2021). Tantangan Guru dalam Mengajar Matematika di Kelas Inklusif. Jurnal Pendidikan Dasar, 12(2), 29-40.

Jannah, R. (2021). Kendala implementasi pendidikan inklusif di sekolah dasar: Studi kasus guru matematika. International Journal of Inclusive Education, 18(3), 67–82.

Kawai, N., , E., King, S., & Hui, F. (2023). The measurement of teachers' attitudes toward inclusive education: An empirical study in East Java, Indonesia. Cogent Education, 10. https://doi.org/10.1080/2331186X.2023.2229014

Kurniawati, F. (2021). Exploring teachers' inclusive education strategies in rural Indonesian primary schools. Educational Research, 63, 198 - 211. https://doi.org/10.1080/00131881.2021.1915698

Mardiana, S. (2020). Pelatihan guru dalam pendidikan inklusif: Tantangan dan peluang. Jurnal Pendidikan dan Kebijakan, 12(1), 45–60. https://doi.org/xxxxx

Miller, D. L., & Baumer, A. (2019). Technology and inclusive education: Support for students with disabilities in mathematics. Journal of Special Education Technology, 34(1), 49-58.

Novianti, A., & Suryani, F. (2021). Penggunaan media pembelajaran adaptif dalam pengajaran matematika inklusif. Mathematics Education Journal, 9(2), 150–170.

Rachmawati, D. (2019). Penerapan Pendidikan Inklusif di Sekolah Dasar: Kendala dan Solusinya. Jurnal Pendidikan Inklusif, 7(2), 25-30.

Rachmawati, L., & Dini, F. (2022). Kolaborasi Guru Kelas dan Guru Pendamping dalam Pembelajaran Matematika Inklusif. Jurnal Pendidikan Inklusif, 9(1), 10-22.

Rasmitadila, R., Humaira, M., & Rachmadtullah, R. (2021). Student teachers' perceptions of the collaborative relationships form between universities and inclusive elementary schools in Indonesia.. F1000Research, 10, 1289 . https://doi.org/10.12688/f1000research.74999.2

Rosyid, F. (2021). Keterbatasan Sumber Daya dalam Pendidikan Inklusif di Sekolah Dasar. Jurnal Pendidikan dan Pengajaran, 14(4), 23-34.

Sari, P., & Yulianto, B. (2020). Strategi guru dalam menggunakan materi ajar inklusif untuk pembelajaran matematika. Jurnal Inovasi Pendidikan, 15(2), 100–115.

Sari, R. (2022). Differentiating instruction in inclusive mathematics classrooms: Challenges and strategies. Journal of Education and Learning, 16(3), 229-239.

Sharma, U., Loreman, T., & Forlin, C. (2018). Impact of inclusive education on the social and academic outcomes of students with disabilities. International Journal of Inclusive Education, 22(9), 927-945.

Simpson, R. L., & Lynch, S. (2016). A review of strategies for managing inclusive classrooms. Journal of Special Education, 50(4), 222-235.

Sparks, D. (2019). Classroom management strategies for inclusive education. Teaching and Teacher Education, 89, 103-111.

Stewart, J. (2017). Multi-sensory strategies in mathematics education. Journal of Special Education and Technology, 32(4), 237-245.

Tomlinson, C. A. (2014). The differentiated classroom: Responding to the needs of all learners. ASCD.

Wright, P. W. D., & Wright, P. D. (2017). The right to special education. The Wrightslaw Way.

Wulandari, S. (2022). Adaptasi Pembelajaran Matematika untuk Siswa Berkebutuhan Khusus di Sekolah Dasar Inklusif. Jurnal Pendidikan Inklusif, 8(3), 51-61.

Zahra, N., & Sumarni, R. (2023). Kesiapan mental guru dalam pengajaran inklusif: Perspektif pendidikan matematika. Journal of Educational Psychology, 25(1), 15–30.