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Analysis of Mathematics Learning Problems in Junior High Schools and Alternative Solutions

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Abstract

This study aims to identify and analyze problems in mathematics learning in Junior High Schools (SMP), with a focus on SMP Muhammadiyah 8 Batu, and to offer alternative solutions. The research method used is a qualitative approach, involving students and teachers as research subjects. The subjects included two students from grades IX-1 and IX-6, representing homogeneous and heterogeneous class contexts, respectively, and two mathematics teachers who teach in these classes. Data were analyzed through observations, questionnaires, and interviews to gain an in-depth understanding of the challenges faced. The results of the study revealed that the main problems in mathematics learning at the school include: 1) poor mastery of mathematics by students, 2) low learning motivation, 3) the use of ineffective learning media, and 4) the application of suboptimal learning methods. To overcome these problems, several alternative solutions are proposed, including the application of scaffolding to help students who experience difficulties, the application of a personal approach to increase learning motivation, and the use of more interesting learning media such as macromedia flash and educational games. In addition, the learning methods used need to be adapted to the characteristics of students, both in homogeneous and heterogeneous classes, to increase the effectiveness of learning.

Keywords: Pembelajaran matematika, masalah pembelajaran, sekolah menengah pertama, scaffolding, motivasi

Abstrak

Penelitian ini bertujuan untuk mengidentifikasi dan menganalisis permasalahan dalam pembelajaran matematika di Sekolah Menengah Pertama (SMP), dengan fokus pada SMP Muhammadiyah 8 Batu, serta menawarkan solusi alternatif. Metode penelitian yang digunakan adalah pendekatan kualitatif, melibatkan siswa dan guru sebagai subjek penelitian. Subjek meliputi dua siswa dari kelas IX-1 dan IX-6, yang masing-masing mewakili konteks kelas homogen dan heterogen, serta dua guru matematika yang mengajar di kelas-kelas tersebut. Data dianalisis melalui observasi, angket, dan wawancara untuk mendapatkan pemahaman mendalam mengenai tantangan yang dihadapi.Hasil penelitian mengungkapkan bahwa permasalahan utama dalam pembelajaran matematika di sekolah tersebut meliputi: 1) penguasaan matematika yang kurang baik oleh siswa, 2) motivasi belajar yang rendah, 3) penggunaan media pembelajaran yang kurang efektif, dan 4) penerapan metode pembelajaran yang belum optimal. Untuk mengatasi permasalahan ini, beberapa solusi alternatif diusulkan, antara

lain, penerapan perancah (scaffolding) untuk membantu siswa yang mengalami kesulitan, penerapan pendekatan personal guna meningkatkan motivasi belajar, dan penggunaan media pembelajaran yang lebih menarik seperti macromedia flash dan permainan edukatif. Selain itu, metode pembelajaran yang digunakan perlu disesuaikan dengan karakteristik siswa, baik di kelas homogen maupun heterogen, untuk meningkatkan efektivitas pembelajaran..

Kata kunci: Pembelajaran matematika, masalah pembelajaran, sekolah menengah pertama, scaffolding, motivasi

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Introduction

Mathematics education worldwide faces significant challenges related to achievement gaps between student groups (Darmayanti & Widodo, 2024; Riswandha & Sumardi, 2020). International data, such as PISA and TIMSS, consistently show significant differences in mathematics achievement based on socioeconomic status, gender, geographic location, and special needs (Utami, 2023). Students from low-income families, rural areas, or those with special needs tend to lag behind other groups in mathematics achievement. This gap occurs not only in developing countries but also in developed countries, indicating that this issue is global and complex.

In Indonesia, international assessment results reinforce this picture. In the 2022 PISA, the average mathematics score for Indonesian students was only 366, far below the OECD average of 472, placing Indonesia in 68th place out of 81 participating countries. More than 80% of Indonesian students have not reached the minimum level of proficiency in mathematics, meaning they struggle to understand and apply basic mathematical concepts in everyday life (Hati, 2021; Jerrim, 2022). The 2019 TIMSS results also showed that both fourth- and eighth-grade students in Indonesia ranked low internationally, with most students failing to achieve the minimum expected benchmark (Sekaryanti et al., 2023).

Indonesia has undertaken various curriculum reform efforts, from the 2013 Curriculum to the Independent Curriculum, which emphasizes active learning, character development, and the integration of local culture (ethnomathematics) (Lutfi, 2022). However, implementation in the field still faces significant challenges. Mathematics teaching practices in many schools are still dominated by lectures, routine practice problems, and summative assessments. Teachers are often not fully prepared to implement differentiated learning, formative assessment, or the optimal use of digital technology.

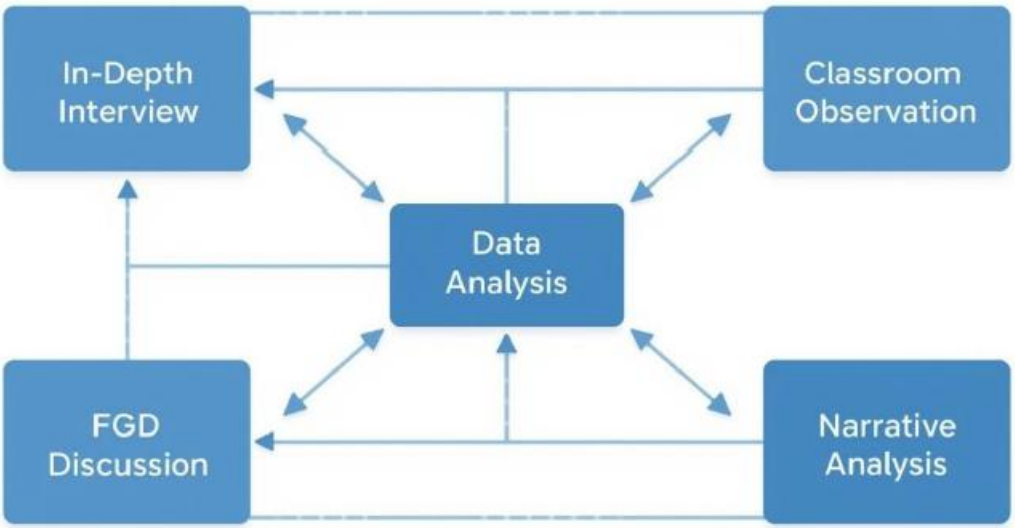
Limited resources, especially in rural areas, exacerbate the situation. Many schools lack qualified mathematics teachers, adequate learning facilities, and access to training and professional development. As a result, mathematics learning tends to be one-way, lacking contextualization, and failing to foster critical thinking, problem-solving, and collaboration skills in students.

Low mathematical literacy and the diverse difficulties faced by students indicate fundamental problems in the mathematics learning process in Indonesia. Gaps in achievement between student groups, challenges in curriculum implementation, and specific difficulties in various mathematics domains require more in-depth and contextualized studies (Lestari et al., 2022; Murti & Sunarti, 2021; Muttaqin & Rizkiyah, 2022). Qualitative research is essential to unearth the root causes of these problems, understand the direct experiences of students and teachers, and design relevant and sustainable solutions.

2. Methods

This study employed a qualitative approach with a case study design, allowing for an in-depth exploration of students' and teachers' experiences in mathematics learning. The subjects were students and mathematics teachers at SMP Muhammadiyah 8 Batu, selected purposively to represent diverse socioeconomic and cultural backgrounds. The subjects consisted of ninth-grade students from two different classes at SMP Muhammadiyah 8 Batu: a class with homogeneous characteristics and a class with heterogeneous characteristics. In addition, the study involved two mathematics teachers who taught in both classes. Subjects

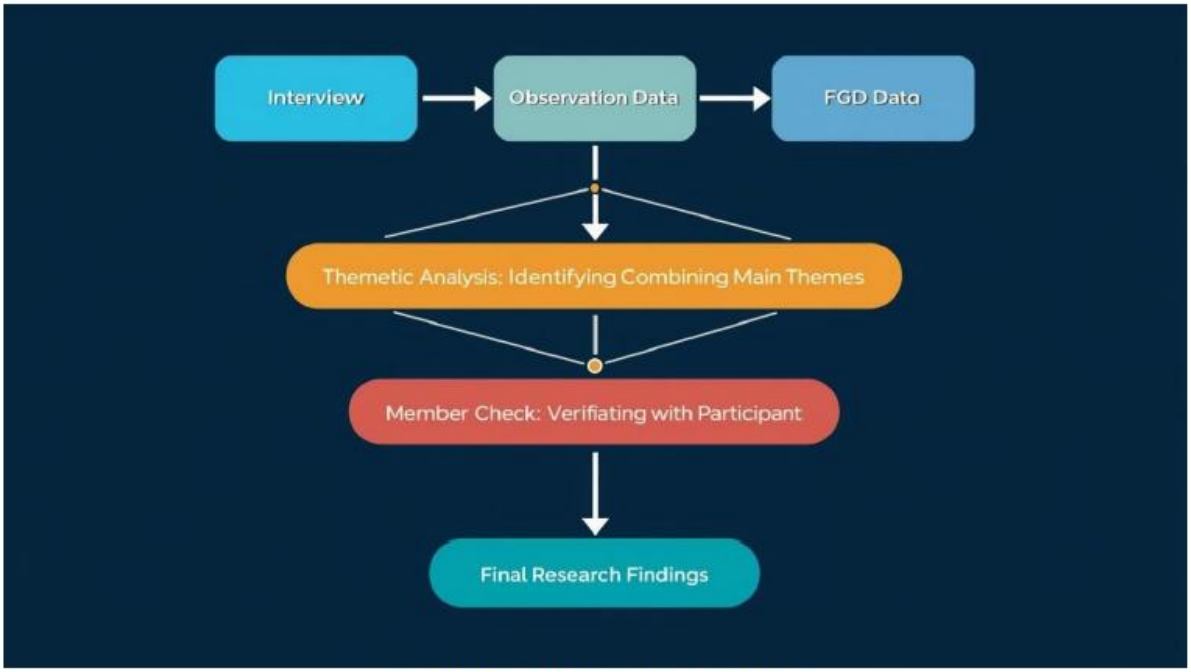
were selected using a purposive sampling technique, which is based on certain criteria deemed relevant to the research objectives. These criteria include students' socioeconomic backgrounds, academic achievement, and the teachers' mathematics teaching experience. With this approach, the researcher was able to obtain representative and in-depth data regarding the problems of mathematics learning in both classes. The number of subjects involved was two students, one from each homogeneous class and one from a heterogeneous class, as well as two mathematics teachers who taught in these classes. This purposive sampling approach allowed the researcher to focus on the most relevant and informative participants in accordance with the research objectives.



Gambar 1. Teknik Pengumpulan Data

Data Collection Techniques

- In-Depth Interviews: To explore students'/teachers' perceptions, experiences, and strategies in dealing with math difficulties.
- Classroom Observations: To record interactions, teaching methods, and learning dynamics directly.
- Focus Group Discussions: To identify norms, shared challenges, and solutions proposed by groups of students/teachers.
- Narrative Analysis: To examine students' stories and reflections on their math learning experiences.



Gambar 2. Teknik Analisis Data

Data Analysis Techniques

- Thematic Analysis: Identifying key themes from interview transcripts, observations, and group discussions
- Data Triangulation: Combining multiple data sources to increase the validity of findings
- Member Check: Involving participants in verifying analysis results to ensure accuracy and credibility

Tabel 1. Ringkasan Rancangan Metodologi Penelitian

Komponen	Deskripsi
Pendekatan	Kualitatif (Studi Kasus)
Subjek	Siswa & Guru SMP/SMA di Indonesia
Teknik Data	Wawancara, Observasi, FGD, Analisis Naratif
Analisis	Tematik, Triangulasi, Member Check
Etika	Informed consent, kerahasiaan, refleksivitas

3. Results and Discusion

Based on research conducted through observations, interviews, and questionnaires with ninth-grade students and mathematics teachers in junior high schools, several major problems in mathematics learning were identified. The most prominent issue is the poor mastery of mathematical concepts among the majority of students. Many students struggle to understand basic mathematical concepts, impacting their ability to solve math problems, particularly story problems and problems requiring the application of concepts to everyday life.

Furthermore, students' motivation for learning mathematics is also relatively low. Students tend to feel fearful, anxious, or insecure when facing mathematics lessons. This is exacerbated by the still-dominant one-way learning method, where teachers primarily explain

the material without actively involving students in the learning process. As a result, mathematics learning becomes less meaningful, and students struggle to connect the material to their real-life experiences.

From the teacher's perspective, obstacles were identified in selecting and implementing varied and innovative learning methods. Teachers tend to use conventional methods, such as lectures and practice problems, which are less effective in generating student interest and participation. Furthermore, time constraints and administrative burdens also hinder teachers from designing creative and enjoyable learning.

Discussion

Several factors can contribute to students' poor mastery of mathematical concepts, including a lack of basic understanding from previous levels, less interactive learning methods, and minimal use of media or visual aids that can help visualize mathematical concepts. Students who do not understand basic concepts will have difficulty following more complex material, resulting in lower academic achievement.

Gambar 3. Alternatif Solusi Permasalahan

Low student motivation to learn is also a challenge. This can be influenced by previous negative experiences, the perception that mathematics is a difficult subject, and a lack of appreciation or positive feedback from teachers. One-way learning makes students passive and disengaged emotionally and intellectually in the learning process.

To address this problem, alternative solutions that can be implemented include:

1. Implementing more active and participatory learning methods, such as group discussions, project-based learning, or the use of interactive learning media. These methods can increase student engagement and help them understand concepts more deeply.
2. Using visual aids and media to make it easier for students to visualize abstract mathematical concepts.
3. Providing motivation and recognition to students who demonstrate effort and progress in learning mathematics can increase their self-confidence and interest in learning.

4. Improving teacher competency through training or workshops on innovative learning strategies and effective classroom management.
5. Individual approaches for students experiencing learning difficulties, for example through tutoring or remedial classes.

By implementing these solutions, it is hoped that the problems of mathematics learning in junior high schools can be minimized, so that the learning process becomes more meaningful, enjoyable, and able to improve student learning outcomes.

4. Conclusion

This study reveals that the main problems in mathematics learning in junior high schools are poor mastery of mathematical concepts and low student motivation. Contributing factors include one-way learning methods that lack active student involvement, as well as limited innovation in teaching strategies by teachers. This condition makes mathematics learning less meaningful and has a negative impact on student learning outcomes. As an alternative solution, this study recommends the implementation of more interactive and participatory learning methods, such as the use of scaffolding, a personalized approach to students, a variety of learning media, and improving teacher competency through training. These approaches are expected to improve students' understanding of mathematical concepts and motivate them to be more active in the learning process. Thus, the problems in mathematics learning in junior high schools can be minimized and the quality of learning can be significantly improved..

5. Author Contributions

Muhammad Rafli Faishal Wardana: Conceptualization, Methodology, Data Collection, Writing – Original Draft, Siti Inganah: Formal Analysis, Resources, Supervision, Writing – Review & Editing, Octavina Rizky Utami Putri: Data Curation, Project Administration, Visualization.

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