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An Analysis of Students' Difficulties in Learning Mathematics on the Topic of Least Common Multiple (LCM) in Class A/1, Cohort 2023

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Abstract

This study aims to analyze students' learning difficulties in mastering the topic of Least Common Multiple (LCM) in Mathematics course in Class A/1, Cohort 2023. This research employs a qualitative descriptive method. Data were collected through tests, interviews, and documentation involving students who experienced difficulties in understanding LCM material. The results show that students face difficulties in understanding the basic concept of LCM, selecting and applying solution methods, performing calculations, and solving word problems. The causes of learning difficulties are internal factors such as lack of prerequisite knowledge, mathematics anxiety, and low self-confidence, as well as external factors such as monotonous teaching methods, lack of instructional media, and limited independent practice. The strategies to overcome these difficulties include the use of concrete and visual learning media, step-by-step exercises, collaborative learning, contextual learning, and direct feedback from lecturers. The findings of this study are expected to contribute to improving the quality of mathematics learning in higher education.

Keywords: learning difficulties, mathematics, LCM, internal factors, external factors

Introduction

Mathematics is a fundamental discipline that plays a crucial role in developing students' logical, analytical, and systematic thinking skills. It is not merely a subject related to numbers and calculations, but also a means of reasoning and problem-solving in various contexts. According to Soedjadi (2000), mathematics is a deductive and structured system of knowledge that trains individuals to think logically and systematically, thereby contributing to the development of scientific thinking. In line with this, NCTM (2000) emphasizes that mathematical learning should enable students to understand concepts, develop reasoning abilities, and apply mathematical knowledge to solve real life problems.

One of the fundamental topics in mathematics is the Least Common Multiple (LCM), known in Indonesian as Kelipatan Persekutuan Terkecil (KPK). This concept is essential because it serves as a foundation for understanding number theory and solving problems related to fractions, time intervals, and patterns. Although LCM is introduced at the elementary level, many students at higher education levels still experience difficulties in mastering it. Based on preliminary observations in Class A/1, Cohort 2023, students tend to struggle in distinguishing LCM from Greatest Common Factor (GCF), as well as in applying appropriate solution strategies such as prime factorization and systematic listing methods.

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Learning difficulties in mathematics are influenced by various factors. According to Hamzah B. Uno (2011), learning difficulties occur when students are unable to achieve optimal learning outcomes due to internal and external barriers. Internal factors include low motivation, anxiety toward mathematics (mathematics anxiety), and cognitive limitations, while external factors include ineffective teaching methods and lack of learning support. Similarly, Suryabrata (2004) explains that learning difficulties may be specific to certain subjects, especially mathematics, and are commonly characterized by misconceptions, procedural errors, and weak conceptual understanding.

Furthermore, Bruner (1960) in his theory of discovery learning argues that mathematical concepts should be learned through meaningful experiences, where students actively construct their own understanding. If basic concepts such as LCM are not properly understood from the beginning, it may lead to persistent misconceptions that hinder the learning of more advanced topics. In addition, Slavin (2009) states that active student engagement in learning processes significantly improves conceptual understanding and academic achievement.

If these learning difficulties are not identified and addressed properly, they may lead to low academic performance and decreased confidence in learning mathematics. Therefore, it is important to analyze the types of difficulties experienced by students, the factors causing these difficulties, and possible strategies to overcome them. This study aims to provide an in-depth analysis of students' learning difficulties in mastering the LCM topic in Mathematics for Class A/1, Cohort 2023.

Research Method

This section presents a detailed description of the research method used in this study. The explanation is provided to ensure that the research process can be clearly understood, traced, evaluated, and potentially replicated by other researchers. It includes the research design, participants, instruments and data collection techniques, research procedure, data analysis technique, validity or trustworthiness, and ethical considerations.

Research Design

This study employed a descriptive qualitative research design. The design was selected because the purpose of the study was to describe students' learning difficulties in mastering the Mathematics topic of Least Common Multiple (LCM), as well as to identify the factors causing these difficulties and the strategies to overcome them. A qualitative approach was considered appropriate since the study focused on understanding students' learning processes, experiences, and difficulties in a natural learning environment rather than measuring variables statistically.

Participants, Population, Sample, or Data Sources

The study was conducted in Class A/1, Cohort 2023, in the Mathematics course of the Teacher Education Program. The population consisted of all students in Class A/1. The participants were students who experienced difficulties in learning the LCM material and were selected using purposive sampling because they were considered to have relevant information related to the research focus. Data sources in this study included written test results, semi-

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structured interviews, and documentation, which consisted of students' answer sheets, field notes, and supporting academic records related to learning activities.

Instruments and Data Collection Techniques

Data were collected using three techniques, namely tests, interviews, and documentation. A written test was used to measure students' understanding of the LCM material and to identify types of errors made in solving problems. Semi-structured interviews were conducted to obtain in-depth information regarding students' learning difficulties, causes of difficulties, and learning experiences. Documentation was used to support and validate the findings from tests and interviews, including students' written work and field notes.

Research Procedure

The research was conducted through several stages. First, the researcher identified the research problem and selected participants who experienced difficulties in learning LCM. Second, a written test was administered to determine students' level of understanding. Third, semi-structured interviews were conducted with selected students to explore their learning difficulties and the factors influencing them. Finally, all data from tests, interviews, and documentation were collected, organized, analyzed, and interpreted to identify patterns of learning difficulties, their causes, and possible solutions.

Data Analysis Technique

Data analysis was conducted using a descriptive qualitative approach based on the interactive model of Miles and Huberman, which consists of data reduction, data display, conclusion drawing, and verification. In the data reduction stage, the researcher selected and focused on relevant data related to students' learning difficulties in LCM. In the data display stage, the data were organized and presented in descriptive form to facilitate interpretation. In the conclusion drawing stage, patterns of difficulties, causes, and possible strategies were identified. Verification was continuously carried out to ensure the accuracy and consistency of the findings.

Validity, Reliability, or Trustworthiness

The trustworthiness of the data was ensured through triangulation of data sources, namely tests, interviews, and documentation. This triangulation was used to compare and confirm the consistency of findings from different sources. In addition, cross-checking was conducted to ensure that the data accurately represented students' actual learning conditions, thereby strengthening the credibility and dependability of the study.

Ethical Considerations

This study was conducted in accordance with ethical research principles. Permission was obtained from the relevant institution before conducting the research. All participants were informed about the purpose of the study, and their participation was voluntary. Confidentiality and anonymity of participants were maintained throughout the research process. The data collected were used solely for academic purposes and reported without revealing participants' identities.

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Results

The findings of this study show that students in Class A/1 Cohort 2023 experienced various learning difficulties in understanding the Least Common Multiple (LCM) material in Mathematics. These difficulties were identified from tests, interviews, and documentation, and are categorized into three main aspects: conceptual difficulties, procedural difficulties, and application difficulties.

Table 1. Students' Learning Difficulties in LCM

Aspect	Findings	Respondents
Conceptual understanding	Students do not understand LCM as the smallest common multiple and often interpret it as multiplication	3 and 6
Method selection	Students are confused in choosing solution methods (listing, factorization, or tables)	1, 3, and 5
Basic calculation	Frequent errors in multiplication, division, and listing multiples	6 and 7
Word problems	Students cannot translate story problems into mathematical form	1, 2, and 5

The table shows that students' difficulties are dominated by weak conceptual understanding and procedural confusion in solving LCM problems. The study also found that these difficulties are influenced by both internal and external factors.

Table 2. Factors Causing Students' Learning Difficulties

Type of Factor	Findings	Respondents
Internal factors	Lack of prerequisite knowledge (multiples, prime numbers, factorization)	2, 3, 5, 6
Internal factors	Mathematics anxiety and low confidence	2, 3, 5, 6
External factors	Monotonous teaching methods (lecture-based)	1, 4, 7
External factors	Lack of visual media and independent practice	1, 4, 7

These findings indicate that learning difficulties are not only caused by cognitive limitations but also influenced by learning environment and instructional approaches. Furthermore, the study identified several strategies to overcome students' difficulties in learning LCM.

Table 3. Strategies to Overcome Learning Difficulties

Strategy	Implementation	Respondents
Visual and concrete media	Using Venn diagrams, factor trees, and visual tools	3, 5, 7
Gradual exercises	From simple tasks to complex word problems	1, 4, 6
Collaborative learning	Group discussions to solve problems together	2, 6, 7
Contextual learning	Linking problems to real-life situations	All students

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Immediate feedback	Lecturer provides correction and guidance directly	3, 4, 5

The table shows that students need interactive, structured, and contextual learning approaches to improve their understanding of LCM concepts.

Discussion

The results of this study indicate that students' difficulties in mastering LCM are multidimensional, involving conceptual, procedural, and application-level challenges. Conceptual misunderstanding occurs because students fail to recognize LCM as the smallest common multiple, which aligns with Soedjadi (2000), who emphasizes that mathematical understanding must be built on strong conceptual foundations.

Procedural difficulties in selecting appropriate methods suggest that students lack problem-solving strategies. According to Bruner (1960), meaningful learning occurs when students actively construct knowledge rather than memorize procedures. The confusion observed in students indicates that learning has been dominated by procedural memorization rather than conceptual understanding.In addition, frequent calculation errors reflect weak prerequisite skills in basic arithmetic operations. This supports Suryabrata (2004), who states that insufficient mastery of basic skills significantly affects students' ability to solve mathematical problems.

Difficulties in solving word problems further indicate low ability in mathematical translation from contextual situations into mathematical expressions. This is consistent with Vygotsky's theory, which highlights the importance of scaffolding and guided learning in developing higher-order thinking skills.The findings also reveal that internal factors such as mathematics anxiety and lack of confidence significantly affect students' performance. This aligns with Hamzah B. Uno (2011), who explains that learning difficulties are influenced by both cognitive and affective aspects of learners.

External factors such as monotonous teaching methods and lack of learning media also contribute to students' low understanding. According to Slavin (2009), active and interactive learning strategies significantly improve student engagement and learning outcomes. Therefore, the lack of variation in teaching methods reduces students' motivation and conceptual understanding.Overall, the findings suggest that improving students' understanding of LCM requires a combination of strengthening conceptual foundations, improving teaching strategies, increasing learning media use, and encouraging active student participation.

Conclusion

Based on the results of the study on the analysis of students' learning difficulties in mastering the Mathematics course topic of the Least Common Multiple (LCM) in Class A/1 Cohort 2023, it can be concluded that students still experience difficulties in understanding the basic concepts of LCM and in selecting and applying appropriate solution methods. These difficulties are reflected in students' inability to distinguish the concept of LCM from multiplication operations, as well as confusion in using methods such as prime factorization, listing multiples, and division tables.

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In addition, the learning difficulties are influenced by both internal and external factors. Internal factors include a lack of prerequisite knowledge, mathematics anxiety, and low self-confidence, while external factors involve monotonous teaching methods, limited learning media, and insufficient independent practice. To address these problems, several instructional strategies are needed, such as the use of concrete and visual learning media, gradual exercises, collaborative learning, contextual learning, and immediate feedback from lecturers. The findings indicate that mastery of LCM cannot be considered complete only through prior learning experiences, but requires continuous conceptual reinforcement so that students can fully understand and apply the concept appropriately as future teachers.

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Conflict of Interest

The author declares that there is no conflict of interest in this study. The research was conducted objectively without any external influence. All findings are presented based solely on the data collected during the study.

Author Contributions

The author is fully responsible for all stages of the research process, from planning to reporting. The entire manuscript was written and compiled solely by the author. The author also carried out data collection, analysis, and interpretation independently.

Data Availability Statement

The data used in this study are available from the author upon reasonable request. However, the data are not publicly accessible due to ethical considerations. This restriction is applied to maintain the confidentiality of participants involved in the study.

Ethical Statement

This research was conducted in accordance with ethical research guidelines. Permission was obtained from the relevant institution prior to data collection. All participants were informed about the purpose of the study and their confidentiality was strictly maintained throughout the research process.

References

Alyusfitri, R., & Wahyuni, Y. (2017). Analisis diagnostik kesulitan belajar mahasiswa PGSD pada mata kuliah konsep dasar matematika II. *Al-Jabar: Jurnal Pendidikan Matematika*, *8*(2), 145-154.

Amallia, N., & Unaenah, E. (2018). Analisis kesulitan belajar matematika pada siswa kelas III sekolah dasar. *Attadib: Journal of Elementary Education*, *2*(2), 123-133.

Creative Commons Attribution 4.0 International License (CC BY 4.0)

Ariska, T. (2020). Analisis Kesulitan Belajar Matematika Siswa Kelas V pada Materi KPK dan FPB Madrasah Ibtidaiyah Negeri 2 Kota Palembang. *El-Ibtidaiy: Journal of Primary Education*, *3*(1), 36-42.

Asmawati, L., Husniati, H., & Khair, B. N. (2023). Identifikasi Kesulitan Belajar Matematika Siswa Kelas Iv Pada Materi Kpk Dan Fpb Di Sdn 03 Suka Makmur Kecamatan Gerung. *Jurnal Ilmiah Widya Pustaka Pendidikan*, *11*(2), 8-16.

Eka, W. (2023). *Analisis Kesulitan Belajar Matematika Materi Fpb Dan Kpk Siswa Kelas Iv Sdn 1 Midang Tahun Pelajaran 2022/2023* (Doctoral dissertation, Universitas_Muhammadiyah_Mataram).

Nilasari, A. P., Malawi, I., & Lestari, S. (2022). Kesulitan Belajar Matematika dalam Menyelesaikan Soal Cerita Pada Siswa Kelas IV Sekolah Dasar. *Prosiding Konferensi Ilmiah Dasar*, *3*, 1505-1514.

Risma, B. K. (2024). *Analisis Kesulitan Siswa Dalam Mengerjakan Soal Matematika Pada Materi Kpk Dan Fpb Siswa Kelas V Sdn Sidomulyo 04 Kecamatan Ungaran Timur* (Doctoral dissertation, UNDARIS).

Saragih, H. A. (2022). Analisis Kesulitan Belajar Matematika Pada Materi KPK dan FPB Siswa Kelas IV SD Negeri 48 Pekanbaru. *Skripsi. Program Studi Pendidikan Guru Sekolah Dasar: Universitas Islam Riau*.

Sari, E. Y., & Windari, G. E. (2019). Analisis Upaya Guru dalam Mengatasi Kesulitan Belajar Siswa Pada Pelajaran Matematika Kelas IV di SDN II Geger Kecamatan Sendang Kabupaten Tulungagung Tahun Pelajaran 2017/2018. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *4*(1), 111-124.

Sari, Y. L., Subekti, E. E., & Wardana, M. Y. S. (2020). Analisis kesulitan belajar pemecahan masalah matematika materi KPK dan FPB kelas IV SD. *Jurnal Sekolah PGSD*, *21*(1), 1-9.

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