



Literature Review: Problems of Mathematics Learning in Schools

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Abstract

Problems that occur in mathematics learning are essential to pay attention to. Problems in mathematics learning are problems that must be resolved with the right solution. This research aims to conduct a literature review on mathematics learning problems in schools. The method used in the study is a literature review. The sample used is the research results related to mathematics learning problems at the elementary, junior high, high, and college levels from student and teacher factors. Data was collected by collecting all published articles from the latest year according to educational level. Then, analysis and conclusions are drawn based on the data obtained. The research results show that the problems found at each station are different. So, the solution used must be the problems faced.

Keywords: Literature; Mathematics Learning; Problems; School.

Introduction

Mathematics is one of the sciences in various aspects of human life (Darmayanti, Hidayat et al., 2023; Rachmawati et al., 2023; Zahroh et al., 2023). Mathematics learning is a process that contains two inseparable types of activities, namely learning and teaching. Mathematics lessons need to be given to all students from elementary school to equip students with the ability to think logically (Huinchahue et al., 2021), analytically (Moreno-Guerrero et al., 2020), systematic (Arthur et al., 2022), critical, and creative (Lin et al., 2017), and able to work together (Darmayanti et al., 2022). Apart from that, from year to year, mathematics develops according to the demands of the times so that people are encouraged to be more creative in developing and applying mathematics as a basic science (Lubis et al., 2021; Zippert et al., 2017). Therefore, it is essential to teach mathematics to students at school (Baiduri et al., 2020; Brookman-Byrne et al., 2019) to produce reliable students in facing changing times.

Learning mathematics is vital in developing human qualities, so it is studied from elementary school to university. If students study mathematics correctly, their reasoning abilities will increase (Ahmed et al., 2023; Darmayanti, 2022; Yuniwati et al., 2024). One way to improve human quality is by learning mathematics because mathematics is widely used in the field of science and the field of technological development (Astuti et al., 2023; Gunawan et al., 2023; Usmiyatun et al., 2023). Mathematics as a fundamental science, both its applied aspects and its reasoning aspects, has a vital role. However, when studying mathematics, many students only accept the lesson without questioning why mathematics is being taught (Astuti et al., 2023; Jannah et al., 2023; Ridho'i et al., 2023). Apart from that, some students think that mathematics is a complex subject, so these students need help to participate in comprehensive mathematics learning (Asgafi et al., 2023; Jayanti et al., 2023; Manik et al., 2022). Sometimes, during mathematics learning, students need to listen to the explanation given by the teacher (Sefira et al., 2024; Sugianto et al., 2023; Zahroh, Rachmawati, et al., 2023). The impact that this can cause is the emergence of a feeling of laziness in studying mathematics.

Student factors or teacher factors can cause problems in learning mathematics (Darmayanti, Utomo, et al., 2023; Riono et al., 2023; Triono et al., 2023). One of the student factors that cause problems in learning is students' poor mastery of mathematical concepts (Fauzi et al., 2022; Suharsiwi et al., 2022; Supriatna et al., 2023). One of the teacher factors that can cause problems in learning mathematics is that teachers experience difficulties in developing material in books because there is so much material that must be taught. The teacher only uses a conventional approach (Kurwiyah et al., 2023; Setiyanti et al., 2022; Sopa et al., 2022). Therefore, this research aims to find out what problems exist in mathematics learning at school, as well as what solutions might be used to overcome these mathematics learning problems.

Research Method

The method used in this research is a literature review. This research method is carried out by identifying, reviewing, evaluating and interpreting all research available. In line with the research (Nafisah et al., 2023), journals were systematically reviewed and identified using this method. This research began with data collection, which was carried out by collecting all research related to mathematics learning problems, analysing data in articles and concluding. Researchers collected journal articles from Google Scholar, Research Gate, SINTA, DOAJ, and Scopus. The essays collected are by the research keywords, namely mathematics learning problems. Researchers collected articles for elementary, middle, high, and college levels. Articles were selected based on the last five years, namely 2019-2023. Researchers

determined 30 suitable papers and then identified problems at each school level. Then, the data obtained is presented in tabular form and analysed. Analysis is carried out on the issues found from student and teacher factors to determine the right solution to overcome these problems. Next, researchers can draw conclusions based on the analysis that has been carried out.

Results and Discussion

Problems of mathematics learning in elementary schools

Problems at the elementary school level found in the researchers' research can be seen in Table 1 and Table 2 below:

Table 1. Problems in elementary school level mathematics learning from factors student

No.	Problems found
1	Students do not understand the material presented by the teacher.
2	Students cannot think mathematically even though they are in high class.
3	Students' lack of interest in learning mathematics
4	Students' mathematical abilities are lacking.
5	Immature understanding of concepts
6	Students' motivation is lacking when studying mathematics.
7	Students consider mathematics to be a difficult and boring subject
8	Students are less active in expressing opinions in learning.

Table 1 shows the findings of mathematics learning problems at the elementary school level from student factors obtained by researchers. The issues found at the elementary school level from student factors include students needing help understanding the material presented by the teacher, students not being able to think mathematically, and students requiring more interest in learning mathematics. Apart from

that, the problems found were students' poor mathematical abilities, immature understanding of concepts, students' lack of motivation when learning mathematics, students who considered mathematics to be a difficult and tedious subject, and students who were less active in expressing opinions during learning.

Table 2. Problems of mathematics learning at elementary school level from teacher factors

No.	Problems found
1	The teacher only explains the material briefly
2	Teachers do not use good learning media
3	The teacher does not ask students' understanding
4	Teachers still use old methods in learning
5	Teachers have difficulty developing the material in books
6	Teachers only use conventional approaches

Table 2 shows the findings of problematic mathematics learning at the elementary school level and teacher factors obtained by researchers. The problems found at the elementary school level from teacher factors include teachers only explaining the material briefly (Hu et al., 2018; Meryansumayeka et al., 2021), teachers still not using good learning media (Asmarani et al., 2022; Iftanti et al., 2021; Zahroh & Mubarak, 2018), the teacher does not ask students' understanding during learning activities (Fauziyah et al., 2021; Herzon et al., 2018), in learning teachers still use old methods (Asmara et al., 2021; Qomariyah et al., 2023), it is difficult for teachers to develop material in books because there is too

much material that must be created to be taught, teachers use conventional learning approaches (Inganah et al., 2023; Lai et al., 2020).

Problems of mathematics learning in junior high schools

The issues of mathematics learning at the junior high school level found in the researchers' research can be seen in Table 3. and Table 4. below:

Table 3. Problems of mathematics learning at the junior high school level from student factors

No.	Problems found
1	Students have difficulty understanding the meaning of story questions
2	Students find it difficult to use multiplication operations when working on essay questions
3	Students find it difficult to understand certain concepts
4	Student not being careful in working on the questions and not correcting the answers that have been written
5	Students have difficulty applying concepts
6	Students have difficulty with mathematical connections in solving certain material problems and in algebraic calculation operations
7	Students have difficulty in concluding the results of problem-solving

Table 3 shows the findings of mathematics learning problems at the junior high school level from student factors obtained by researchers. The problems found at the Junior High School level from student factors include students needing help understanding the meaning of word problems, students needing help with using multiplication operations when working on essay questions, and students needing help understanding certain concepts. Apart from that, the problems found

were that students were not careful in working on questions and did not correct the answers that had been written, students had difficulty applying concepts, students had difficulty with mathematical connections in solving specific material problems and in algebraic calculation operations, and students had difficulty in concluding the results of problem-solving.

Table 4. Problems of mathematics learning at the junior high school level from teacher factors

No.	Problems found
1	Teachers are not disciplined when working
2	Teachers do not change their mindset and way of teaching.
3	Teachers are not innovative and creative.
4	Teachers do not have the knowledge and expertise to use certain learning models.
5	Teachers do not develop learning tools.

Table 4 shows the findings of mathematics learning problems at the junior high school level teacher factors obtained by researchers. The issues found at the Junior High School (SMP) level from teacher factors include teachers are not disciplined when working (Retnawati et al., 2018), and the teacher does not change their mindset (Baskoro et al., 2006; Eriyanti et al., 2022a; L. N. Rachmawati et al., 2021). How to teach, teachers are not innovative and creative. Teachers must still gain the knowledge and expertise to use specific learning models. Teachers have

yet to be able to develop learning tools (Manalu et al., 2018; Prasetya & Cholily, 2021; Wicaksono et al., 2021).

Problems of mathematics learning in high school

The problems of mathematics learning at the high school level found in the researchers' research can be seen in Table 5 and Table 6 below:

Table 5. Mathematics learning problems in high school from student factors

No.	Problems found
1	Students are not active in learning activities.
2	Students find it difficult to express opinions.
3	Students do not understand the concept.
4	Students have difficulty performing arithmetic operations.
5	Students are not careful when working on questions.
6	Decreased learning motivation, learning concentration, and impact on student learning achievement
7	Students are less accustomed to solving problems.
8	Students learning independence is still lacking.

Table 5 shows the findings of problematic mathematics learning at the high school level from student factors obtained by researchers. The problems found at the Senior High School (SMA) level from student factors include students needing to be more active in learning activities. (Lestari & Putri, 2020), Students find it difficult to express opinions (Sari et al., 2018), students do not understand the concept (Apriliani et al., 2016), students have difficulty performing arithmetic operations

(Eriyanti et al., 2022b; Santoso et al., 2021), Students are not careful when working on questions. Apart from that, the problems found were a decrease in learning motivation and learning concentration, which impacted learning achievement; students were less accustomed to solving problems, and students' learning independence still needed improvement (Fauza et al., 2022; Schukajlow et al., 2022).

Table 6. Mathematics learning problems in high school from teacher factors

No.	Problems found
1	Teachers have difficulty carrying out assessments.
2	Teachers do not take advantage of technological developments.
3	Teachers pay less attention to interactions with students.
4	Teachers have difficulty delivering all lesson material on time.
5	The teacher does not prepare the media well.
6	The teacher's paradigm regarding the new curriculum has not completely changed from the previous curriculum.

Table 6 shows the findings of problematic mathematics learning at the high school level teacher factors obtained by researchers. The problems found at the high school level from teacher factors include teachers needing help carrying out assessments and teachers needing to be more disciplined when working. (Safrida et al., 2016), Teachers do not take advantage of technological developments (Wawan et al., 2018), teachers pay less attention to interactions with students, teachers have difficulty delivering all lesson material on time, teachers do not prepare the media well, and the teacher's paradigm has not

entirely changed regarding the new curriculum to the previous curriculum (Gustina et al., 2020; Nalurita et al., 2019).

Problems of mathematics learning in higher education

The issues of mathematics learning at the tertiary level found in the researchers' research can be seen in Table 7 and Table 8 below:

Table 7. Problems of learning mathematics at the university level from student factors

No.	Problems found
1	Student interests and talents are relatively low.
2	Students' mathematics learning experiences at previous school levels
3	Students' critical thinking abilities are still low.
4	Student's difficulties in numeracy literacy when solving problems
5	Collaboration and communication between students is still lacking.
6	Student's difficulties in solving technology-based problems
7	Students find it difficult to understand concepts.

Table 7 shows the findings of mathematics learning problems at the tertiary level from student factors obtained by researchers. The issues found at the tertiary level from student factors include: students' interests and talents are relatively low, students' mathematics learning experience at previous school levels, students' critical thinking skills are

still soft, and students' difficulties in numeracy literacy when solving problems. Apart from that, collaboration and communication between students still need improvement. Students need help solving technology-based issues and understanding concepts (Asih et al., 2019; Russo & Minas, 2020).

Table 8. Problems of learning mathematics at the university level from lecturer factors

No.	Problems found
1	The lecturer just delivers the material, gives exercises, and ends with a test.
2	Lecturers lack integration between topics, even with other fields.
3	The use of teaching methods by lecturers where the lecturer delivers the material without adjusting the students' abilities.
4	Lecturers are less open and invite students to solve problems.
5	The dominant role of lecturers in the learning process
6	The learning strategies applied by lecturers are not appropriate.

Table 8 shows the findings of problematic mathematics learning at the tertiary level lecturer factors obtained by researchers. The problems found at the tertiary level from lecturer factors include lecturers only delivering material followed by giving exercises and ending with tests. Lecturers need to integrate more between topics, even with other fields (Singer, 2017; Unver, 2018). Apart from that, the use of teaching methods by lecturers where the lecturer delivers material without adjusting to students' abilities, the lecturer is less open and invites students to solve problems, the role of the lecturer is dominant in the learning process, and the learning strategies applied by the lecturer are not appropriate (Cankoy & Özder, 2017; Utomo et al., 2021).

Problems experienced by students require solutions to overcome existing problems. Many problems are found at each school level from student and teacher factors. Students experience many difficulties. Students need help understanding the material the teacher presents because their basic skills still need improvement. Students need a process to understand the material provided by the teacher. To overcome this problem, students should first read the fabric that will be taught when studying at home. Apart from that, students need help to think mathematically. This happens because the thought process is less developed (Leavy, 2020; Setyowati et al., 2020; Usmiyatun et al., 2021). This problem can be overcome by continuously training students' thinking processes by solving mathematical problems. Then, talk about students' interest in learning mathematics, which can be overcome by attracting interest through learning activities that constantly innovate using different methods. In this way, students' abilities will improve for the better.

Mathematical skills that are still lacking and an immature understanding of concepts can be enhanced through the teacher's role in the learning process. This is also related to the motivation given by teachers to students during the learning process. Because this support will increase students' motivation to learn mathematics, the learning process in class is essential to pay attention to because students still think learning mathematics could be more challenging and exciting (Hutajulu et al., 2019; Marzuki et al., 2021; Silver, 1996). Students find it difficult to express opinions during learning and remain silent. To overcome this problem, teachers must prepare an appropriate learning implementation plan. This way, the learning process will run well, and students will participate in class activities.

Problems faced by students that are also often encountered are related to solving mathematical problems. Students need help solving math problems. Story questions are often overlooked,

making students need help understanding the meaning of the questions. Sometimes, students need to be more careful in carrying out calculation operations. Apart from that, students make conceptual errors and principle errors when working on questions. Students' poor mathematical connection abilities prevent them from writing conclusions in solving the problems given (Abdillah et al., 2021; Benidiktus Tanujaya et al., 2017). The solution to overcome this problem is to provide practice questions to students frequently. Teachers can give non-routine questions that require critical thinking from students. It is hoped that the questions presented are not routine questions that students usually ask when they get example questions from a particular material. So that students' abilities will continue to develop in solving mathematical problems. Teachers must also be able to prepare appropriate assessments so that student learning outcomes are maximised.

Problems from teacher factors also require solutions to overcome the issues that occur. In mathematics learning, teachers and students have a related relationship in achieving learning goals. So, the problems that occur must be resolved together. Not only do students have issues that need to be overcome, but teachers must also be willing to improve so that the mathematics learning process is carried out well. Teachers' teaching styles must be enhanced and abandon conventional techniques. Teachers can use different methods so they do not consistently deliver the material. Apart from that, teachers should use more than just books as teaching materials. The teacher must also prepare learning media so students can easily understand the material. Teachers' abilities in developing technology also need to be considered. Rapid technological developments require teachers to provide technology-based learning to students. An assessment process using technology must also be carried out. This is related to developing students' abilities in solving technology-based problems.

Teacher discipline in teaching students needs to be improved. Teachers should not present material only briefly. This can cause not all of the material that students should get. This problem can be overcome by adequately arranging time allocation during learning activities. Teachers must have the responsibility to carry out learning according to the plans that have been made. Apart from that, problems related to interactions between teachers and students must be well established. The reciprocal process during the learning process needs to be given maximum attention. Teachers must create a comfortable and conducive classroom atmosphere so that student's interest in learning mathematics can increase. In this way, mathematics learning objectives can be achieved well and optimally.

The importance of teacher discipline in teaching students has been recognised in much educational research and literature. Several studies highlight the importance of appropriate time allocation during learning, where teachers must ensure sufficient time to convey the material well to students. Teachers also need to pay attention to student interactions, provide an excellent reciprocal process in the classroom, and create a comfortable and conducive environment for learning. Several studies also highlight that teacher discipline in teaching impacts student interest and learning achievement. When teachers can create a fun environment that attracts students' interest, students tend to be more motivated to learn and master the subject matter better.

Conclusion

Based on the results and discussion presented above, the conclusion of this research shows that mathematics learning probes are still often found at every level, from elementary school to university. These problems arise from student and teacher factors. The issues found are different for each school level. So, it is necessary to consider solutions to overcome the difficulties. There are many publications of articles about the problems of learning mathematics every year. Research has found many findings regarding students' difficulties in understanding mathematical concepts. Of the teacher factors, researchers discussed a lot regarding the lack of innovation in the learning methods used and the lack of use of media in learning. So, to overcome this problem, teachers need attention to using the proper solution.

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