**Journal of Educational Research and Evaluation**
Volume 8, Issue 2, 2024, pp. 306-316
P-ISSN: 2597-422x E-ISSN: 2549-2675
Open Access: https://doi.org/10.23887/jere.v8i2.74056

# Barriers and Difficulties of Students in the Mathematics Learning Process in Junior High Schools

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**ARTICLE INFO**

**Article history:**
Received January 11, 2024
Accepted April 11, 2024
Available online May 25, 2024

***Kata Kunci :***
*Analaisis Hambatan, kesulitan, Siswa Sekolah Menengah, Matematika*

**Keywords:**
Analysis of Obstacles, Difficulties, Middle School Students, Mathematics



***ABSTRAK***

*Rendahnya hasil belajar matematika pada siswa, khususnya pada materi perbandingan, yang tercermin dari nilai rendah pada Ujian Nasional dan hasil belajar di kelas. Kesulitan belajar yang dialami siswa dapat disebabkan oleh beberapa faktor, baik internal maupun eksternal. Tujuan penelitian ini yaitu untuk menganalisis hambatan kesulian siswa dalam pembelajaran matematika serta penyebabnya. Subjek yang terlibat yaitu 30 siswa. Jenis penelitian ini yaitu penelitian campuran dengan menggunakan metode pengumpulan data berupa tes, wawancara dan angket. Instrumen yang digunakan adalah lembar angket tertutup dan pedoman wawancara. Teknik analisis data dengan cara pengumpulan data yaitu teknik analisis data model interaktif, khususnya pada bagian reduksi data dan penarikan kesimpulan. Hasil penelitian mengungkapkan bahwa, terdapat 12 siswa yang mengalami kesulitan dalam menafsirkan bahasa. Kesulitan tersebut seperti, sulit untuk memahami inti permasalahan yang diberikan, dan sulit untuk mengintegrasikan bahasa sehari-hari ke dalam kedalaman bahasa matematika. Adapun kesimpulan yang dapat dirumuskan yaitu kesulitan yang dialami siswa muncul karena dirinya sendiri dan dari orang-orang di sekitar lingkungan sekolahnya. Implikasi penelitian ini yaitu, para pendidik meracang materi dengan memperbaiki konsep dan literasi matematika dalam mengatasi kesulitan siswa.*

**ABSTRACT**

Low math learning outcomes in students, especially in comparison materials, are reflected in low scores on the National Exam and learning outcomes in the classroom. Several factors, both internal and external, can cause learning difficulties experienced by students. This study aims to analyze the obstacles to students' difficulties in learning mathematics and their causes. The subjects involved were 30 students. This type of mixed research uses data collection methods through tests, interviews, and questionnaires. The instruments used are closed questionnaire sheets and interview guidelines. Data analysis techniques using data collection are interactive model data analysis techniques, especially in the data reduction and conclusion drawing sections. The results revealed that 12 students experienced difficulties in interpreting language. These difficulties include difficulty understanding the problem's core and integrating everyday language into the depth of mathematical language. The conclusion that can be formulated is that the difficulties experienced by students arise because of themselves and from people around their school environment. This research implies that educators design materials by improving concepts and mathematical literacy to overcome student difficulties.

## 1. INTRODUCTION

Difficulty is a condition of a person's inability to carry out, run, and complete work (Kendzerska et al., 2021; Barney et al., 2020; Ekpanyaskul & Padungtod, 2021). These difficulties can be seen in the behavior of a person who experiences certain obstacles or disorders, both psychologically and physically (Robertson et al., 2021). In general, difficulties in children often occur during the process of growth and development toward adulthood, and the environments that influence this process are family, community, and school (Pater et al., 2022; Guessoum et al., 2020; Pavlopoulou et al., 2022). Schools are places where students hone their academic skills and are given moral and mental motivation through their various experiences at each level of education (Rasmussen et al., 2022; Godbold et al., 2021). The definition of education is a conscious effort that adults systematically plan to guide someone who is yet to mature

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towards maturity (Garrigan et al., 2018). When they are adults, they are expected to be able to carry out their life tasks independently and responsibly (Friesen & Lowe, 2012; Iivari et al., 2020). In this case, learners try to develop their potential through the learning process in educational channels, both informal, formal, and non-formal education (Rivera-Ferre et al., 2021; Kicherova & Trifonova, 2023). Apart from being independent and responsible, many potentials can be developed in a student (Whitelock-Wainwright et al., 2021). This is explained in the National Education System Law No. 20 of 2003, which states that students can have religious, spiritual strength, pleasing personality, self-control, noble character, intelligence, and skills through education (Sauri et al., 2022; Mujahidin et al., 2023). A student's intelligence can be seen from his learning outcomes; this is in line with the opinion of other researchers who state that a person's learning outcomes are influenced by his emotional intelligence and intellectual intelligence (Alzoubi & Aziz, 2021).

Learning outcomes are the abilities students obtain after participating in learning activities. These abilities are characterized by relatively permanent student behavior changes (Powell et al., 2016; Halomoan, 2022). Independent learning is a process carried out by a person to achieve new behavior changes (Eger et al., 2021). These changes are obtained from the results of individual experiences in interacting with their environment. In reality, the results of student experience are still relatively low. This is proven by research that found that the mathematical literacy of secondary school students still needs to improve, even though the international test design used in the research has been adapted to the Indonesian context Ferrero et al., (2021). Mathematics is classified as the most difficult field of learning and is hated by students. Evidenced by the results of the 2019 National Examination, the Mathematics subject was at the lowest average grade level, namely 46.56 at the SMP level, 42.24 at the MTs level, at the SMP level, 42.24 at the MTs level, 37.53 at the SMA Bahasa level, 39.33 at the SMA IPA level, 34.46 at the SMA IPS level, and 35.26 at the SMK level (Sandilos et al., 2020). Mathematics is one of the most challenging fields of study and is hated by students. The 2019 National Examination results show that the Mathematics subject is at the lowest average score level, namely 46.56 at the junior high school level, 42.24 at the MTs level, 37.53 at the high school level, language, 39.33 at the high school science level, 34.46 at the SMA IPS level, and 35.26 at the SMK level (Sandilos et al., 2020). Low National Examination results are an indication of learning difficulties among students. Low learning outcomes were also found in class VII in Mathematics subjects. Only 5 out of 35 students got a score above the Minimum Completeness Criteria (KKM), while the other 30 got a score below 75. From the data obtained, six students had good to excellent abilities, while 29 had moderate to excellent abilities low. In addition, the data shows that 71% of students in this class need help understanding comparative material, even though the average ability level of students is quite adequate based on exam results. The average exam score for one class is 58.22.

Researchers also sought further information from mathematics teachers who taught students in this class regarding the causes of low student learning outcomes. According to Mrs. Riska, students in class tend to be less active when asked questions during the learning process. Students still need to improve in understanding previous mathematics material, such as arithmetic operations and length units and are hampered in working on story questions. Students' understanding of the material is still lacking, students are unable to work on questions that are different from the example questions even though the meaning of solving the questions is the same, and some students rarely participate in online learning in class during distance learning because quotas run out or network problems (Alimbudiono et al., 2022). Dr. Maria Goretti Adiyanti from the Child Development Psychology section of the UGM Faculty of Psychology said that children who have learning difficulties do not necessarily have inadequate intelligence. According to him learning difficulties arise from the condition of children who have to struggle to be able to achieve achievements like children at their age, especially to meet the demands of school (Goldberg et al., 2021). That is what causes learning difficulties in children generally arise from 2 factors, namely internal factors, namely challenges that come from the child himself, and external factors, namely difficulties that come from outside the child; other researchers add that learning difficulties from internal factors are divided into two sub-factors, namely physiological factors seen from the physical condition of students, and psychological factors seen from the psychological condition of students (Liu et al., 2021; Sakdiyakorn & Wattanacharoensil, 2018). While learning difficulties from external factors consist of three sub-factors namely; family factors, community factors, and school factors (Yetkin Özbük & Coşkun, 2020; Lumbantoruan & Manalu, 2024).

In line with the phenomenon of learning difficulties, the results of research conducted showed that junior high school students had not fully achieved good learning outcomes in comparative material (Dahlin & Watkins, 2000; Halomoan Lumbantoruan, 2023). Many students still have difficulty solving story problems. Dominant student difficulties can be categorized into three factors, namely; lack of understanding of concepts, haste in solving problems, and lack of understanding of problems. Based on the results of interviews conducted, the cause of these difficulties was because students were not used to being given

questions in the form of stories. According to researchers, teachers should give story questions to students more often in order to add to their learning experience (Dahlström, 2019; Lumbantoruan & Ditasona, 2024). In addition, research conducted by other researchers also found learning difficulties experienced by Grade VII students of Junior high school Luhur Baladika in learning comparative material. The learning difficulties of children at the school include: concept errors, procedural errors, and algorithm errors. The cause of the difficulty occurs in students because students are not able to understand concepts properly, students cannot combine the concepts needed in solving problems, student negligence factors, students do not understand the purpose of questions and problem-solving steps. The researcher added, in working on comparative material questions students experienced difficulties because there was a concept of comparative material that students did not understand, which resulted in students experiencing misconceptions about comparative material (Gozzard & Zadnik, 2021). Based on some of the facts above, it appears that in providing learning the teacher does not understand the characteristics of his students, causing obstacles to students and resulting in low student understanding (Tang et al., 2021; J. H. H. Lumbantoruan, 2022).

This research is urgent because the field has a gap between theory, expectation, and reality. In theory, by preparing a good learning framework, students are expected not to experience difficulties and can obtain satisfactory results and achievements in mathematics learning. However, in reality, students still obtain low learning outcomes, which impact their knowledge and understanding in subsequent lessons. Therefore, this research needs to be conducted to analyze the obstacles and difficulties faced by students in mathematics lessons and the causes of these difficulties so that this problem does not recur.

## 2. METHODS

The research approach and method used is a mixed method, which is qualitatively explored and deepened from social phenomena and the social environment consisting of actors, events in place, and time (Jurgilevich et al., 2021). The social background is described in such a way that in conducting qualitative research it develops basic questions about events and phenomena that occur, how these events can occur, who is involved in these events, when these events occur, where they occur (Mingers & Standing, 2017). Research with a qualitative approach produces findings that cannot be achieved using statistical procedures using quantification methods. The data generated during this research process is interpreted and concluded during the research process (Mathew et al., 2021). The data is described one by one in the form of descriptive and holistic descriptions. This is in line with the opinion by other researchers that descriptive research is data collection based on factors that support the research object, then these factors are analyzed to find their role (Li et al.,2021). There are 2 objects studied, namely; 1) the obstacles and types of student learning difficulties, and 2) the causal factors of the difficulties experienced by students during the learning process of the Comparative material takes place. The subjects of this study were 30 class VII.2 students of Jakarta's junior high school who received daily test scores below the minimum completeness criteria. Interview Sample. 6 out of 30 students were selected as samples in the interview, these students served as resource persons for further analysis regarding the results of tests and questionnaires that had previously been made. This research was conducted at junior high school 58 Jakarta in Class VII.2. This research takes place in the even semester of the 2022/2023 academic year, with a period of 4 months. The following are indicators and research instruments presented in Table 1.

**Table 1**. Research Indicators and Instruments

| N0. | Indicator | Instrument | Number of Items |
|---|---|---|---|
| 1 | Obstacle | Barriers to Understanding Terminology | 8 |
| | | Barriers to Understanding Concepts | 6 |
| | | Barriers to understanding the principles | 5 |
| | | Barriers in Language | 8 |
| | | Obstacles from the Surrounding Environment | 7 |
| 2 | Difficulty | Difficulty In Terminology | 8 |
| | | Difficulty In Concept | 6 |
| | | Difficulty In Principle | 5 |
| | | Difficulty In Language | 8 |
| | | Difficulties from the Surrounding Environment | 7 |

Data collection techniques with tests, questionnaires, and interviews. The test is a series of questions or exercises that discuss a certain set of material, which is used to measure the knowledge, intelligence, abilities possessed by students (Zwart et al., 2020). In addition, the test is a systematic

procedure for observing or describing a person using a numerical standard category system (Buswell et al., 2020). The researcher conducted tests on the entire population, namely 30 students who received daily test scores under the minimum completeness criteria with questions prepared based on the class VII mathematics syllabus, lesson plans and daily test questions that had previously been made by the teacher. The researcher conducted the test again even though the daily test had been carried out by the previous subject teacher. This is because the results of the daily tests have been returned to students and currently not all students have them. While in this study the analysis of student difficulty data was focused on the student's working process not based on the grades obtained. For this reason, the researcher coordinated with the teacher to make another test with questions similar to the daily test that had previously been given by the teacher. The test lasts for 60 minutes, consisting of 5 questions that must be answered by students. The results of this test are analyzed to see the types of difficulties students experience in understanding comparative material. After conducting the test, the researcher also distributed questionnaires to research subjects, they filled out the questionnaire according to the situations and conditions they felt and experienced during the learning process. The questionnaire that the researcher uses is a closed questionnaire where the questions have been structured starting from the questions. In a closed questionnaire, each question has alternative answers, so students will choose the answer that best suits their characteristics (Shim & Lee, 2020).

This questionnaire is intended as an initial data analysis regarding the causes of students' difficulties in comparative material, this questionnaire the researchers compiled based on indicators from limited theoretical studies. Researchers limit the factors that cause students' learning difficulties in learning mathematics. The interview that the researcher conducted was a guided free interview, in which the interviewer only brought a guide which was an outline of the matter being asked. The guidelines are arranged in an unstructured manner where the interview guidelines only contain the main points being asked. Researchers can ask questions freely while still guided by these points. The advantage of this interview is that the informant or respondent is not fully aware that he is being interviewed so that it will have an impact on his answers that are more natural and broad (Ninan, 2020).

Data analysis technique. This researcher used an interactive model data analysis technique that was disclosed by (Zhu et al., 2020). He revealed that the process of analyzing data is carried out continuously until the data is saturated (Guo et al., 2020). The stages of data analysis according to other researchers are as follows. First, data collection. In the early stages of the research, conducting a general exploration of the social situation and the object under study, everything the researcher saw and recorded everything. Thus, researchers get a lot of data and varied. Second, data reduction (Data Reduction). The data obtained from the field is quite a lot so it needs to be broken down and grouped. Reducing data means summarizing, selecting, and sorting out the things that are found to then focus on being an important subject of the results of data analysis. Third, test analysis techniques. The researcher described each student's error in working on the problem according to the aspects of the error that had been compiled in the previous theory section. The researcher limited the analysis of students' working answers to focus on 4 aspects of errors, including the following: a) Language Interpretation Errors, b) Conceptual Errors, c) Data Using Errors, and d) Technical Errors. Then after finding the form of student difficulties in the form of a description of the error in solving the problem. Fourth, data display (data presentation), data presentation is done in the form of brief descriptions, charts, relationships between categories. And finally, data verification (drawing conclusions). The results of presenting each data found are then crimped into a credible conclusion which will later become a new finding for school solutions (Boone et al., 2019).

## 3. RESULT AND DISCUSSION

### Results

Based on data analysis, shows 89% of students or 27 students who experienced at least 1 error in each test item, the details include; questions 1 and 2 each have 27 students, question 3 all students, question 4 , 26 students, and question 5 have 24 students. Then in working on this problem there were 12 students out of 30 students who did not answer a maximum of 1 question out of the 5 questions that had been given, the details of the question along with the number of students who did not do it were; question number (1) has 1 student, question number (2) has 3 students, question number (4) has 2 students, and question number (5) has 6 students. In addition, there were also 4 students who correctly answered a maximum of 1 question out of 5 questions, the details were; there were 2 students who correctly answered question number (1) and there were 2 students who correctly answered question number (2). Classification of 4 aspects of error from all questions, namely; found 61 errors in language interpretation, 106 errors in concepts, 42 errors in data, and 98 technical errors. For this reason, it can be concluded from the 5 questions, the errors that often occur are conceptual errors and technical errors. The details of the

difficulties found in each aspect of the error are as follows: 1) Difficulties in the aspect of language interpretation errors. From this error it was found that students had difficulty reading the questions carefully, had difficulty understanding the essence of the questions given, and had difficulty integrating everyday language into the language of mathematics. This was also found in the results of the interviews, student R13 had difficulty understanding the essence of the questions on the problem, namely the total number, was not careful in reading the comparisons on the questions, and had difficulty interpreting the word difference which should be reduced but multiplied.

Difficulties such as this language can be overcome by presenting teaching modules compiled by the teacher himself. In addition, student R27 was less thorough in understanding the essence of the problem, which should have made a comparison of student heights from the shortest to the highest. However, he actually thought the problem was sorting the height of the students from the shortest to the highest. Then it was also found that student R17 was wrong in integrating additional words in the problem which should have meant reducing the number of days from the 50% worker to the initial number of workers but instead he added. 2) Difficulties in the aspect of Concept errors. From this error it was found that students found it difficult to understand the concept of a comparison of an amount (unable to distinguish between a comparison with the actual number), difficulty understanding the concept of calculating the coefficient of comparison, difficulty understanding the concept of finding variables from an equation (ordinary equation or comparative equation), and it is difficult to understand the concept of the difference in the amount to find the value of the coefficient of comparison of the number.

In addition, it was also found that students found it difficult to understand the concept of units of length, difficult to understand the concept of scale on the map (looking for JP and JS), and difficult in the concept of dividing two fractions. This is in line with research that strategies are needed for a learning process. There are also students who experience difficulties in understanding the concept of equivalent comparisons (lack of variable instances, unclear comparison positions, not using equivalent comparison methods, using inverse value comparison methods) and inverse value comparison concepts (example variable coefficients of more than 1, unclear comparison positions, does not use a clear concept, uses the concept of comparison of worth). This is also found in the results of interviews, students R13 and R30. Do not understand the concept of finding the coefficient values of each comparison. R13 students actually equate the difference from the number of comparison coefficients. Student R30 has the wrong concept in the equation of a variable where it should divide the value of 24 by 8 but instead multiplies it. It was seen from students R13 and R27 that they did not understand the concept of finding the value of a variable where 18 should be divided by 2 but instead it was hooked by 2. Apart from that, out of the six students, it was seen that only one person memorized the long unit ladder sequence, namely student R17. However, when given examples of student questions R17 had difficulty calculating changes in length units. Then there are also R30 students who do not understand the concept of a scale which is basically stated in the questions. Of the six students, it can be concluded that they did not understand the formula for the concept of scale on a map. Meanwhile, from the six students, it can also be concluded that they did not understand the concept of dividing two fractions (cross multiplication). In addition, student R17 claimed that he had never been taught by the teacher about this concept.

As for the six students, it can be concluded that they did not fully understand the concept of worth. Students R5, R6, and R30 are right in concluding this problem is a matter of comparison of worth. However, they were wrong in implementing the formula or theorem so that the results found did not match what they should have been, namely 36km. In addition, student R17 is correct in calculating the distance but still claims that this question is a comparison of turning points. Likewise with the concept of turning in value, from the six students it can be concluded that they did not fully understand the concept of turning in value. Students R5 and R30 are right in concluding this problem is a matter of comparison of values. However, they were wrong in implementing the formula or theorem so that the results found did not match what they should have been, namely 5 days. 3) Difficulties in the error aspect of Using Data. From this error it was found that students had difficulty using data that should have been in working on questions by adding data that was not needed, it was difficult to enter values in the process of calculating changes in units of measure. This was also found in the interview results, student R6 was wrong in writing the number 32 into the letter B2. Student R7 also experienced errors in entering data in making comparisons of the number of workers. 4) Difficulties in the aspect of technical errors. From this error it was found that students had difficulty calculating multiplication and division operations (some had not completed their calculations), had difficulty using the right symbols in computing, and had difficulty calculating multiplication and division of decimal data. This was also found in the results of the interviews; the six students were still weak in calculating division operations and there were still many who experienced miscalculations and were slow to calculate multiplication operation data. Apart from being slow in multiplication, there were students who were still not precise in calculating multiplication operations, student R13 was wrong in multiplying the

value 18 by 2. In addition, there were students who experienced technical errors in writing their answers, namely the number 6 which should be 8.

**Discussion**

Factors Causing Student Learning Difficulties. The results of the analysis of the factors causing the difficulties found through the questionnaire and its validation based on the answers from the interview results are as follows. First, the identity of the 30 student respondents consisted of 17 male students and 13 female students. In addition, the details of the ages of the 30 students include; 1 student is 12 years old, 18 students is 13 years old, 10 students is 14 years old, and 1 student is 15 years old. From these data it can be concluded that not all students have an appropriate AGE at their level of study at school. This of course can cause disruption in communication between fellow students because of the AGE gap between them (Butler et al., 2022; Nugraha & Liow, 2021). This disorder can certainly cause learning difficulties in students during the learning discussion takes place. This is in line with the results of the interviews, students R17, R27, and R30 felt they did not know friends and were afraid of being thought to be looking for attention by other friends when they wanted to invite friends to discuss. The teacher also stated in the interview that the relationship between his students was less intimate because the learning situation started with online learning when they first entered school. The researcher also asked about the level of IQ (Intelligence Quotients) of each student. Then the details of the IQ of 30 students include; 10 students are in the Low Average category, 16 students are in the Normal category, 3 students are in the High Average category, and 1 student is in the Superior category (above average). It can be concluded that students' intelligence abilities in that class the average is normal to a low average. In this questionnaire, it was found that student data did experience difficulties caused by themselves and the teacher and school. Of the two factors, the percentage that was determined was held by external factors, namely 64%, while internal factors had a smaller percentage, namely 56%. However, because the presentation is not much different, it can be concluded that the difficulties arise because of himself and the people around him (school) (J. H. Lumbantoruan & Deliviana, 2023; Expression et al., 2020).

Details of the causes of each factor are as follows. First, internal factors. Based on the results of the analysis, it was found that 30 students experienced 56% of the total difficulties caused by internal factors. In more detail, 30 students experienced difficulties due to 52% physical and 58% psychological factors. a) Difficulty learning due to physical disorders such as impaired vision or hearing. Interview results showed that several students experienced vision problems despite wearing glasses because of their sitting position at the back. In addition, students were reluctant to move forward even though the teacher suggested it because no students dared to start, and they could not take photos of the blackboard because they were prohibited from using phones while studying. The teacher also stated that using telephones while studying is not permitted. b) Forgetting previous material related to comparative material, such as mathematical arithmetic operations, length units, and weight units. From interviews with six students, almost all students needed help understanding the current comparison material. c) Spend a little time at home studying comparative material regularly. Interview results show that students need a regular study schedule at home. Generally, they only study when there are assignments and exams. d) Learning comparative material because of demands from parents or teachers (Bertoldi, 2011; van Alten et al., 2020). The interview results show that R30 students learn because their parents pay attention to them.

e) Relying on other people (friends/parents/family) to do comparative material assignments. Interviews showed that students R5, R17, R27, and R30 studied with the help of family members at home. Students R5, R6, and R3 also stated that they needed friends to understand material they did not understand. f) Feeling uncomfortable when studying comparative material. Interviews showed that six students felt embarrassed, tense, afraid, and depressed when studying, not because Mrs Riska was angry but because she was firm in teaching by asking questions to test the students' abilities. g) Embarrassed to ask teachers or friends when there is comparative material that is not understood. Interviews showed that students were embarrassed or afraid to ask Mrs. Riska questions, and conversely, they were also reluctant to answer questions from Mrs. Riska. The reasons include, among other things, R15 students were afraid of being punished for standing, R17 and R30 students were afraid because they did not understand the material from the start, and R6 and R30 students did not understand the language of Mrs Riska's explanation. h) Concentration is easily broken when studying comparative material (chatting, busy with other activities, sleepy, and lack of focus). Interviews show that students quickly lose focus, so they miss explanations from Mrs. Riska, who tends to be quick. i) Lack of confidence in mastering comparative material. Interviews showed that students often answered with the words "sorry if I'm wrong", "wrong sis", and "right or not sis", which shows they are not sure about their answers and understanding. j) Feeling tired when studying comparative material (study hours, study load).

Second, external factors. Based on the results of the analysis, it was found that 30 students experienced 64% of the total difficulties caused by external factors. a) Students do not understand the comparative material taught by the teacher. Interviews showed that students felt learning was too fast, so they did not have time to take notes and could not take photos of the whiteboard because they were prohibited from using their phones while studying. However, the results of interviews with teachers show that this happens because the school's achievement targets require teachers to teach quickly. b) Did not receive introductory material from the teacher or additional assignments related to previous material. Interviews showed that six students were asked to memorize length units but were not tested individually. Apart from that, students only memorize without understanding how to calculate changes in units of length. Students R13 and R27 also stated that the teacher did not explain the basis for comparison, and the practice questions were not discussed to clarify students' mistakes in understanding the material. c) Not getting teacher support (motivation, assistance, etc.) when studying comparative material. This is contrary to other researchers' opinion that students must get motivation from teachers (Amtu et al., 2020; Engin, 2020; Selvaraj et al., 2021).

d) Receive a warning or punishment from the teacher if you don't do your assignments, submit your assignments late, and get test results below the minimum completeness criteria. Interviews showed that student R15 was afraid of being punished for standing up if they answered incorrectly, and student R17 stated that students who chatted or were not focused in class would be punished for standing up. Teachers also stated that standing punishments were used to discipline students and test understanding. e) Get less diverse learning from teachers. Interviews show monotonous learning because students never work in groups or learn using media other than videos and books (Amin & Wahyudin, 2022; Pulukuri & Abrams, 2021). The results of teacher interviews show that teachers experience limitations in providing enjoyable learning media for students. f) Classroom facilities (desks, chairs, whiteboard, projector, AC, etc.) are inadequate for the learning process of comparative material. g) Did not receive an explanation regarding the learning implementation plan (RPP) or the material that will be studied for one year before the comparative material learning process begins. h) Difficulty or embarrassment in conveying opinions/complaints/questions to the teacher during comparative material learning. Interviews showed that students were embarrassed or afraid to ask and answer Mrs. Riska's questions. i) Lack of student openness towards teachers. Interviews show that students are less open with teachers regarding learning and other difficulties.

The teacher also stated that students were not active in the learning process either by asking or answering questions from the teacher. Teachers also claim that students are less familiar with each other, and communication with students is limited due to students' inactivity in responding to teachers. j) Having a negative image of the teacher (fierce, talkative, can't take a joke, killer, etc.) during comparative learning, resulting in students' lack of openness to the teacher regarding learning obstacles. Interviews show that Mrs. Riska rarely gets angry and is only firm in teaching. However, the pace of teaching may not be suitable for students who need more time to understand the material. Sudden questions from him can also make students feel afraid and uncomfortable while studying. k) Rarely or never discuss and collaborate with friends when working on comparative material assignments. Interviews showed that students R17, R27, and R30 felt embarrassed asking their friends because they did not know each other or were afraid of being seen as seeking attention from other friends. l) Tends to violate the rules when taking tests/exams on comparative material (cheating, opening books, looking for answers). m) Inappropriate rest periods during comparative material learning. n) The exam questions given do not match the material taught by the teacher (practice questions, grids, etc.) during comparative material learning. o) Teachers behave subjectively (discriminatory) when learning comparative material (Amin & Wahyudin, 2022; Kim et al., 2021). Interviews with R30 students show that teachers rarely reply to their messages. However, teachers stated that sometimes they could not reply to students' messages because of other activities, so students' messages were covered by other messages.

p) The assignments given by the teacher involve too much comparative material. This contradicts other researchers' opinion that the learning process must be student-centred (Shofwan et al., 2021). The deadline for submitting assignments the teacher gives is too early or inappropriate. Interviews showed that the practice questions given by Mrs. Riska were quite varied, so students were confused about solving them. However, on average, students stated that the number and time for submitting assignments was appropriate; only R30 students stated that there were too many assignments. From the explanation that has been given, it can be concluded that the research conducted has advantages. First, this study identifies various types of errors made by students in working on math problems, such as concept errors, language interpretation, data use, and technical errors. Second, this study analyzes errors from test results and interviews, providing a more in-depth view of the factors that influence students' learning difficulties. Finally, this study categorizes the factors causing difficulties into internal and external factors, providing a

clear picture of the aspects that affect student learning outcomes. However, this study has limitations, such as only involving 30 students, so the results may not be generalizable to all students in junior high school and only focus on mathematics, so it may not reflect the difficulties experienced by students in other subjects. Therefore, future researchers should use more samples and not only focus on one topic. This research contributes significantly to understanding the obstacles and difficulties students face in learning mathematics and offers concrete solutions that can be applied to overcome these problems. In addition, this study implies that educators design materials by improving mathematical concepts and literacy in overcoming students' difficulties.

## 4. CONCLUSION

Students have difficulty reading questions carefully, have difficulty understanding the essence of the questions given, and have difficulty integrating everyday language into the depth of mathematical language. Student's difficulties in understanding and using concepts, students experience difficulties in understanding and using concepts. Students experience difficulty in understanding the concept of comparing numbers, difficulty in understanding the concept of calculating comparison coefficients, difficulty in understanding the concept of finding variables from an equation, and difficulty in understanding the concept of the difference in quantities to find the value of the comparison coefficient of these numbers. Apart from that, students have difficulty understanding the concept of units of length, difficulty understanding the concept of scale on a map, and difficulty in the concept of dividing two fractions. The lack of celebration within himself makes it difficult for students to communicate with teachers and friends. Meanwhile, from the subject teacher's perspective, teachers do not spend enough time to understand students.

## 5. REFERENCES

Alimbudiono, R. S., Selline, A., Metta, C. H., & Can, J. D. (2022). Student's Motivation, Learning Style and Performance during Study from Home. *Journal of Educational and Social Research*, *12*(5), 152–161. https://doi.org/10.36941/jesr-2022-0130.

Alzoubi, H. M., & Aziz, R. (2021). Does emotional intelligence contribute to quality of strategic decisions? The mediating role of open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(130), 1-20. https://doi.org/10.3390/joitmc7020130.

Amin, F., & Wahyudin, A. Y. (2022). The Impact of Video Game: "Age of Empires Ii" Toward Students' Reading Comprehension on Narrative Text. *Journal of English Language Teaching and Learning*, *3*(1), 74–80. https://doi.org/10.33365/jeltl.v3i1.1818.

Amtu, O., Makulua, K., Matital, J., & Pattiruhu, C. M. (2020). Improving student learning outcomes through school culture, work motivation and teacher performance. *International Journal of Instruction*, *13*(4), 885–902. https://doi.org/10.29333/iji.2020.13454a.

Barney, A., Buckelew, S., Mesheriakova, V., & Raymond-Flesch, M. (2020). The COVID-19 Pandemic and Rapid Implementation of Adolescent and Young Adult Telemedicine: Challenges and Opportunities for Innovation. *Journal of Adolescent Health*, *67*(2), 164–171. https://doi.org/10.1016/j.jadohealth.2020.05.006.

Bertoldi, A. E. (2011). ri s Co py th o. *International Journal of Educational Development*, *72*(1), 1-10. https://doi.org/https://doi.org/10.1016/j.ijedudev.2019.102141.

Boone, T., Ganeshan, R., Jain, A., & Sanders, N. R. (2019). Forecasting sales in the supply chain: Consumer analytics in the big data era. *International Journal of Forecasting*, *35*(1), 170–180. https://doi.org/10.1016/j.ijforecast.2018.09.003.

Buswell, R. A., da Silva, W. R. L., Bos, F. P., Schipper, H. R., Lowke, D., Hack, N., Kloft, H., Mechtcherine, V., Wangler, T., & Roussel, N. (2020). A process classification framework for defining and describing Digital Fabrication with Concrete. *Cement and Concrete Research*, *134*(May), 1-12. https://doi.org/10.1016/j.cemconres.2020.106068.

Butler, N., Quigg, Z., Bates, R., Jones, L., Ashworth, E., Gowland, S., & Jones, M. (2022). The Contributing Role of Family, School, and Peer Supportive Relationships in Protecting the Mental Wellbeing of Children and Adolescents. *School Mental Health*, *14*(3), 776–788. https://doi.org/10.1007/s12310-022-09502-9.

Dahlin, B., & Watkins, D. (2000). The role of repetition in the processes of memorising and understanding: A comparison of the views of German and Chinese secondary school students in Hong Kong. *British Journal of Educational Psychology*, *70*(1), 65–84. https://doi.org/10.1348/000709900157976.

Dahlström, H. (2019). Digital writing tools from the student perspective: Access, affordances, and agency. *Education and Information Technologies*, *24*(2), 1563–1581. https://doi.org/10.1007/s10639-018-9844-x.

Eger, L., Komárková, L., Egerová, D., & Mičík, M. (2021). The effect of COVID-19 on consumer shopping behaviour: Generational cohort perspective. *Journal of Retailing and Consumer Services*, *61*(March), 1-11. https://doi.org/10.1016/j.jretconser.2021.102542.

Ekpanyaskul, C., & Padungtod, C. (2021). Occupational Health Problems and Lifestyle Changes Among Novice Working-From-Home Workers Amid the COVID-19 Pandemic. *Safety and Health at Work*, *12*(3), 384–389. https://doi.org/10.1016/j.shaw.2021.01.010.

Engin, G. (2020). An Examination of Primary School Students' Academic Achievements and Motivation In Terms of Parents' Attitudes, Teacher Motivation, Teacher Self-efficacy and Leadership Approach. *International Journal of Progressive Education*, *16*(1), 257–276. https://doi.org/10.29329/ijpe.2020.228.18.

Expression, C., Alba, G., & Casagrande, M. (2020). Systematic Review of the Literature About the Effects of the COVID-19 Pandemic on the Lives of School. *Frontiers in Psychology*, *11*(October), 1–8. https://doi.org/10.3389/fpsyg.2020.569348.

Ferrero, M., Vadillo, M. A., & León, S. P. (2021). A valid evaluation of the theory of multiple intelligences is not yet possible: Problems of methodological quality for intervention studies. *Intelligence*, *88*(September), 1-14. https://doi.org/10.1016/j.intell.2021.101566.

Friesen, N., & Lowe, S. (2012). The questionable promise of social media for education: Connective learning and the commercial imperative. *Journal of Computer Assisted Learning*, *28*(3), 183–194. https://doi.org/10.1111/j.1365-2729.2011.00426.x.

Garrigan, B., Adlam, A. L. R., & Langdon, P. E. (2018). Moral decision-making and moral development: Toward an integrative framework. *Developmental Review*, *49*(June), 80–100. https://doi.org/10.1016/j.dr.2018.06.001.

Godbold, R., Whiting, L., Adams, C., Naidu, Y., & Pattison, N. (2021). The experiences of student nurses in a pandemic: A qualitative study. *Nurse Education in Practice*, *56*(1), 103186.1-8. https://doi.org/10.1016/j.nepr.2021.103186.

Goldberg, A. E., McCormick, N., Frost, R., & Moyer, A. (2021). Reconciling realities, adapting expectations, and reframing "success": Adoptive parents respond to their children's academic interests, challenges, and achievement. *Children and Youth Services Review*, *120*(August 2020), 105790.1-14. https://doi.org/10.1016/j.childyouth.2020.105790.

Gozzard, D. R., & Zadnik, M. G. (2021). Contribution of self-directed, naked-eye observations to students' conceptual understanding and attitudes towards astronomy. *Physical Review Physics Education Research*, *17*(1), 10134.1-16. https://doi.org/10.1103/PhysRevPhysEducRes.17.010134.

Guessoum, S. B., Lachal, J., Radjack, R., Carretier, E., Minassian, S., Benoit, L., & Moro, M. R. (2020). Adolescent psychiatric disorders during the COVID-19 pandemic and lockdown. *Psychiatry Research*, *291*(June), 113264.1-6. https://doi.org/10.1016/j.psychres.2020.113264.

Guo, Q., Zheng, Y., Shi, J., Wang, J., Li, G., Li, C., Fromson, J. A., Xu, Y., Liu, X., Xu, H., Zhang, T., Lu, Y., Chen, X., Hu, H., Tang, Y., Yang, S., Zhou, H., Wang, X., Chen, H., … Yang, Z. (2020). Immediate psychological distress in quarantined patients with COVID-19 and its association with peripheral inflammation: A mixed-method study. *Brain, Behavior, and Immunity*, *88*(May), 17–27. https://doi.org/10.1016/j.bbi.2020.05.038.

Halomoan, J. H. L. (2022). Difficulty of Mathematics teacher competence in applying curriculum online. *Asian Journal of Educational Technology*, *1*(1), 44–54. https://doi.org/10.53402/ajet.v1i2.16.

Halomoan Lumbantoruan, J. (2023). The Impact of Student Engagement and Motivation in the Statistics Learning Process. *Journal of Research in Mathematics Education*, *1*(October), 1–22. https://doi.org/10.17583/redimat.12884.

Iivari, N., Sharma, S., & Ventä-Olkkonen, L. (2020). Digital transformation of everyday life – How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *International Journal of Information Management*, *55*(June), 102183.1-6. https://doi.org/10.1016/j.ijinfomgt.2020.102183.

Jurgilevich, A., Räsänen, A., & Juhola, S. (2021). Assessing the dynamics of urban vulnerability to climate change: Case of Helsinki, Finland. *Environmental Science and Policy*, *125*(July), 32–43. https://doi.org/10.1016/j.envsci.2021.08.002.

Kendzerska, T., Zhu, D. T., Gershon, A. S., Edwards, J. D., Peixoto, C., Robillard, R., & Kendall, C. E. (2021). The effects of the health system response to the covid-19 pandemic on chronic disease management: A narrative review. *Risk Management and Healthcare Policy*, *14*(December 2022), 575–584. https://doi.org/10.2147/RMHP.S293471.

Kicherova, M. N., & Trifonova, I. S. (2023). Non-Formal Education: the Review of Current Studies. *Obrazovanie i Nauka*, *25*(2), 46–67. https://doi.org/10.17853/1994-5639-2023-2-46-67.

Kim, J. J., Yoon, Y., & Kim, E. J. (2021). A comparison of faculty and student acceptance behavior toward learning management systems. *International Journal of Environmental Research and Public Health*, *18*(16). https://doi.org/10.3390/ijerph18168570.

Li, F., Lu, H., Hou, M., Cui, K., & Darbandi, M. (2021). Customer satisfaction with bank services: The role of cloud services, security, e-learning and service quality. *Technology in Society*, *64*(July 2020), 101487.1-11. https://doi.org/10.1016/j.techsoc.2020.101487.

Liu, Q., Feng, Y., & London, K. (2021). Theorizing to improve mental health in multicultural construction industries: An intercultural coping model. *Buildings*, *11*(12), 1–19. https://doi.org/10.3390/buildings11120662.

Lumbantoruan, J. H., & Deliviana, E. (2023). Development of a logarithmic module equipped with a jigsaw cooperative model. *Jurnal Elemen*, *9*(2), 616–629. https://doi.org/10.29408/jel.v9i2.17520.

Lumbantoruan, J. H., & Ditasona, C. (2024). Development of a mathematics module on circle material based on the small group discussion model. *Journal of Education and Learning (EduLearn)*, *18*(1), 18–25. https://doi.org/10.11591/edulearn.v18i1.20920.

Lumbantoruan, J. H. H. (2022). Impact of Unprepared Competence and Difficulty in Competence of Mathematics Teachers During Online Learning. *JTAM (Jurnal Teori Dan Aplikasi Matematika)*, *6*(4 (2022): October), 876–892. https://doi.org/10.31764/jtam.v6i4.9164.

Lumbantoruan, J. H., & Manalu, R. U. (2024). Effectiveness of learning mathematics derivative materials using modules equipped with cooperative models in high schools. *International Journal of Evaluation and Research in Education* , *13*(1), 523–533. https://doi.org/10.11591/ijere.v13i1.25354.

Mathew, G., Agha, R., Albrecht, J., Goel, P., Mukherjee, I., Pai, P., D'Cruz, A. K., Nixon, I. J., Roberto, K., Enam, S. A., Basu, S., Muensterer, O. J., Giordano, S., Pagano, D., Machado-Aranda, D., Bradley, P. J., Bashashati, M., Thoma, A., Afifi, R. Y., … Noureldin, A. (2021). STROCSS 2021: Strengthening the reporting of cohort, cross-sectional and case-control studies in surgery. *International Journal of Surgery Open*, *37*(December), 1-6. https://doi.org/10.1016/j.ijso.2021.100430.

Mingers, J., & Standing, C. (2017). Why things happen – Developing the critical realist view of causal mechanisms. *Information and Organization*, *27*(3), 171–189. https://doi.org/10.1016/j.infoandorg.2017.07.001.

Mujahidin, E., Rosyadi, A. R., & Handrianto, B. (2023). Quality Assurance of Darul Muttaqien Pesantren As an Implementation of Pesantren Law Number 18 of 2019 Concerning …. *Russian Law Journal*, *XI*(6), 9–20.

Ninan, J. (2020). Online naturalistic inquiry in project management research: Directions for research. *Project Leadership and Society*, *1*(September), 100002.1-9. https://doi.org/10.1016/j.plas.2020.100002.

Nugraha, M. S., & Liow, F. E. R. I. (2021). The Identification of Online Strategy Learning Results While Students Learn from Home During the Disruption of the COVID-19 Pandemic in Indonesia. *Journal of Contemporary Issues in Business and Government*, *27*(02). https://doi.org/10.47750/cibg.2021.27.02.205.

Pater, L., Kollen, C., Damen, F. W. M., Zandstra, E. H., Fogliano, V., & Steenbekkers, B. L. P. A. (2022). The perception of 8- to 10-year-old Dutch children towards plant-based meat analogues. *Appetite*, *178*(August), 106264.1-10. https://doi.org/10.1016/j.appet.2022.106264.

Pavlopoulou, G., Burns, C., Cleghorn, R., Skyrla, T., & Avnon, J. (2022). "I often have to explain to school staff what she needs". School experiences of non-autistic siblings growing up with an autistic brother or sister. *Research in Developmental Disabilities*, *129*(August), 104323.1-14. https://doi.org/10.1016/j.ridd.2022.104323.

Powell, E., Woodfield, L. A., & Nevill, A. M. (2016). Increasing physical activity levels in primary school physical education: The SHARP Principles Model. *Preventive Medicine Reports*, *3*(June), 7–13. https://doi.org/10.1016/j.pmedr.2015.11.007.

Pulukuri, S., & Abrams, B. (2021). Improving Learning Outcomes and Metacognitive Monitoring: Replacing Traditional Textbook Readings with Question-Embedded Videos. *Journal of Chemical Education*, *98*(7), 2156–2166. https://doi.org/10.1021/acs.jchemed.1c00237.

Rasmussen, B., Hutchinson, A., Lowe, G., Wynter, K., Redley, B., Holton, S., Manias, E., Phillips, N., McDonall, J., McTier, L., & Kerr, D. (2022). The impact of covid-19 on psychosocial well-being and learning for australian nursing and midwifery undergraduate students: a cross-sectional survey. *Nurse Education in Practice*, *58*(May 2021), 103275.1-9. https://doi.org/10.1016/j.nepr.2021.103275.

Rivera-Ferre, M. G., Gallar, D., Calle-Collado, Á., & Pimentel, V. (2021). Agroecological education for food sovereignty: Insights from formal and non-formal spheres in Brazil and Spain. *Journal of Rural Studies*, *88*(Desember), 138–148. https://doi.org/10.1016/j.jrurstud.2021.10.003.

Robertson, M., Duffy, F., Newman, E., Prieto Bravo, C., Ates, H. H., & Sharpe, H. (2021). Exploring changes in body image, eating and exercise during the COVID-19 lockdown: A UK survey. *Appetite*, *159*(November 2020), 105062.1-6. https://doi.org/10.1016/j.appet.2020.105062.

Sakdiyakorn, M., & Wattanacharoensil, W. (2018). Generational Diversity in the Workplace: A Systematic Review in the Hospitality Context. *Cornell Hospitality Quarterly*, *59*(2), 135–159. https://doi.org/10.1177/1938965517730312.

Sandilos, L. E., Baroody, A. E., Rimm-Kaufman, S. E., & Merritt, E. G. (2020). English learners' achievement in mathematics and science: Examining the role of self-efficacy. *Journal of School Psychology*, *79*(February), 1–15. https://doi.org/10.1016/j.jsp.2020.02.002.

Sauri, S., Gunara, S., & Cipta, F. (2022). Establishing the identity of insan kamil generation through music learning activities in pesantren. *Heliyon*, *8*(7), e09958.1-7. https://doi.org/10.1016/j.heliyon.2022.e09958.

Selvaraj, A., Radhin, V., KA, N., Benson, N., & Mathew, A. J. (2021). Effect of pandemic based online education on teaching and learning system. *International Journal of Educational Development*, *85*(June 2021.), 102444.1-11. https://doi.org/10.1016/j.ijedudev.2021.102444.

Shim, T. E., & Lee, S. Y. (2020). College students' experience of emergency remote teaching due to COVID-19. *Children and Youth Services Review*, *119*(October), 105578.1-7. https://doi.org/10.1016/j.childyouth.2020.105578.

Shofwan, I., Santosa, I. W., Sutarto, J., Fakhruddin, F., & Soraya, F. (2021). Implementation of cooperative learning model in homeschooling as equality education. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, *2*, 3438–3446.

Tang, Y. M., Chen, P. C., Law, K. M. Y., Wu, C. H., Lau, Y. yip, Guan, J., He, D., & Ho, G. T. S. (2021). Comparative analysis of Student's live online learning readiness during the coronavirus (COVID-19) pandemic in the higher education sector. *Computers and Education*, *168*(November 2020), 1-17. https://doi.org/10.1016/j.compedu.2021.104211.

van Alten, D. C. D., Phielix, C., Janssen, J., & Kester, L. (2020). Self-regulated learning support in flipped learning videos enhances learning outcomes. *Computers and Education*, *158*(February), 104000.1-16. https://doi.org/10.1016/j.compedu.2020.104000.

Whitelock-Wainwright, A., Tsai, Y. S., Drachsler, H., Scheffel, M., & Gašević, D. (2021). An exploratory latent class analysis of student expectations towards learning analytics services. *Internet and Higher Education*, *51*(April 2019), 1-12. https://doi.org/10.1016/j.iheduc.2021.100818.

Yetkin Özbük, R. M., & Coşkun, A. (2020). Factors affecting food waste at the downstream entities of the supply chain: A critical review. *Journal of Cleaner Production*, *244*(Januari), 118628.1-58. https://doi.org/10.1016/j.jclepro.2019.118628.

Zhu, M., Sari, A. R., & Lee, M. M. (2020). A comprehensive systematic review of MOOC research: Research techniques, topics, and trends from 2009 to 2019. *Educational Technology Research and Development*, *68*(4), 1685–1710. https://doi.org/10.1007/s11423-020-09798-x.

Zwart, D. P., Noroozi, O., Van Luit, J. E. H., Goei, S. L., & Nieuwenhuis, A. (2020). Effects of Digital Learning Materials on nursing students' mathematics learning, self-efficacy, and task value in vocational education. *Nurse Education in Practice*, *44*(May 2019), 102755.1-8. https://doi.org/10.1016/j.nepr.2020.102755.