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Students' difficulties: Mathematical creative thinking skill questions based on habits of mind

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ABSTRACT

This study aims to describe the types of difficulties experienced by students in solving mathematics problems based on students' mathematical creative thinking ability and habits of mind. This research included survey research with quantitative and qualitative approaches. The subjects of the study were 519 students of State Junior High School and State Madrasah Tsanawiyah who came from ten schools with high, medium, and low accreditation categories in Kampar Regency, Riau, Indonesia. The sample in this study was determined by stratified proportional random sampling technique. The instruments used were a diagnostic test consisting of four mathematical problems based on mathematical creative thinking skills and a habits of mind questionnaire consisting of 40 statements referring to 16 habits of mind indicators. Students who obtained diagnostic test scores less than the KKM set by each school. Interviews were conducted with students who experienced difficulties to clarify the types and locations of difficulties experienced by students. The results of the study showed that; 35.26% have difficulties in understanding the problems, 53.76% in transforming problems, 54.38% in the mathematical process, and 54.82% in determining the final answer, and judging from the habits of mind, the very high category is 38.42%, the high category by 44.91%, the medium category by 50.74%, the low category by 53.06%, and the very low category by 52.45%. Students still have difficulty in solving math problems so making the teacher an active facilitator of students can help students understand and determine what steps to take towards difficulties in solving problems.

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INTRODUCTION

Mathematics learning contains various components, which basically guide students to conceptualize and construct their mathematical knowledge in different ways, and use their unique experiences in life and mathematics learning (Bishop et al., 2015). The Mathematical Association explains the purpose of learning mathematics where each problem has a different construction and solution technique depending on the situation faced by students so that educational success can be achieved (Chambers, 2008). Education is said to be successful if the teaching and learning process runs well and meaningful (Mohamad Hsbollah & Hassan, 2022). One very important role in the successful implementation of education is the teacher. Teachers play a role in creating teaching and learning conditions that are able to deliver students to obtain predetermined competencies (Hennebry-Leung &

Xiao, 2023). In order for the predetermined competencies to be achieved in the process of teaching mathematics, a teacher needs to know and identify what are the difficulties of students with the mathematics material being taught (Haryadi & Nurmaningsih, 2019).

Learning difficulties in mathematics have their own characteristics when compared to learning difficulties in other subjects, including difficulties in distinguishing numbers, mathematical symbols, understanding concepts, calculations, and writing facts, especially in solving mathematical problems in the form of story problems ('Ashri & Aini, 2021; Fauzi & Arisetyawan, 2020). Guner, (2020) noted that out of 164 students, 89.02% of students stated that learning mathematics still had difficulties where students mentioned that learning mathematics had too many rules and formulas so they tended to memorize. The statement is not without reason . The fact is that educators tend to focus on mathematics itself, not on the thought processes of their students so there is no in-depth diagnosis of students' difficulties in learning mathematics (Wijaya et al., 2019). Diagnosing students' difficulties in depth means that educators can create math learning with problems that can help students' development in the thinking process. Teachers who teach mathematics are expected to play a role in developing innovative and creative thinking skills in students (Hidayati et al., 2021).

Problem solving in mathematics takes many forms, from the simple to the high thinking skills used to solve them. It is important to note that proper math questions are problems that can help sharpen students' minds in solving problems so that the questions of high other thinking skills become a problem that plays a very important role in students' cognitive development. This is in line with the report of Department of Mathematics and Computer Science, (1993) suggests five types of problems in mathematics; (1) Problems that test memory; (2) Problems that test skills; (3) Problems that require the application of skills to familiar situations; (4) Problems that require the application of skills to unfamiliar situations and developing strategies for new problems; (5) Problems that require extensions of familiar skills or theories before they are applied to unfamiliar situations. The types of problems that test memory, skills, and the application of familiar skills are the types of mathematics problems that are routinely given to students, these types of problems are usually lacking in improving students' mathematical thinking skills, while the types of problems that apply skills to unusual situations and problems that combine several theories are problems that aim to hone students' math thinking skills.

The type of mathematics problem in fostering students' higher order thinking skills is a level of problem that is categorized as still difficult for Indonesian students (Deda et al., 2020). The PISA study conducted up to 2018 showed that Indonesian students scored below the international standard of under 500 (OECD, 2016, 2019a, 2019b). This makes Indonesia among the bottom 10. These low scores indicate that students have not mastered the material tested. In mathematics, only 28% of students reached OECD level two proficiency, while only 1% mastered higher-order mathematical skills (OECD, 2019a). This indicates that there are still high difficulties for students in solving the mathematics problems given.

Similar to the PISA survey, in the analysis of the National Examination results issued by the Centre for Educational Assessment of the Research and Development Agency of the Ministry of Education and Culture (Puspendik, 2019), it is shown that the absorption of the National Examination questions each year changes according to the difficulty level of the questions that year. However, mathematics has always been a subject with a low average score compared to other subjects where some materials in almost every UN, the absorption of students is less than 50% (Puspendik, 2019). Possible factors causing low student absorption in National Exam questions are as follows: (a) HOTS-based questions that are relatively difficult for students to understand; (b) Students' low elaboration skills make it difficult to turn the details of the problem description into an appropriate mathematical model; (c) Students tend to stick to the formulas they memorize so that the solution only knows one way (Syutaridho, 2016); (d) Students' thinking skills are still low; (e) Calculation errors (lack of accuracy). This explains that students actually need skills that support the thinking process that students must have.

4C skills are skills that will be needed in the 21st century, which include one important skill, namely mathematical creative thinking ability. This ability is a major asset for students in optimizing their brain performance to develop students thinking power. Students' ability to propose creative ideas should be renewed by guiding them to think about ideas or different perspectives of each student. Creativity in mathematics is a higher category than others where there is a difference from achievement in conventional tests of mathematical skills, knowledge, and understanding (Haylock & Thangata, 2007). Creativity in mathematics contributes significantly to the thinking process because it is one of

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the higher order thinking skills (HOTS). In the end, mathematical creative thinking ability has an important role in supporting the thinking process to the cognitive process of students in solving the problems given.

While cognitive aspects influence the ability to solve mathematical problems, affective aspects also play a role in the development of students' power and mindset in solving problems. Habits of mind is one of the affective aspects that affect the cognitive process of students who will tend to behave intelligently which forms a pattern of good behaviour that can encourage their success in solving problems that do not immediately know the solution (Costa & Kallick, 2000). Habits of mind are the pinnacle of individual intelligence, besides that habits of mind are also an indicator of academic ability related to success (Qadarsih, 2017). Habits of mind imply behaviour that requires a discipline of mind which is then trained in such a way that it becomes a habit to keep trying to take wiser and smarter actions (Kurniasih, 2017). The determinant of a person's success can be seen from the various kinds of habits he makes (Costa & Kallick, 2000), so that what is important in success is his habit of thinking where the habits of mind that students do, especially in learning mathematics, will greatly impact the achievement of their success.

There has been researched on student difficulties in learning mathematics, but it focuses on learning by teachers (Wijaya et al., 2019), to student difficulties in story problem problems that focus on literacy (Habibullah & Hartono, 2019; Muhazir et al., 2021). This research is more focused on the kinds and positions of student difficulties in solving mathematics problems based on creative thinking skills based on the habits of mind of students in the Kampar district. By identifying students' difficulties in solving creative thinking ability problems, educators will get solutions to each student's problems and can create learning designs that can improve students' mathematical thinking abilities, especially creative thinking abilities. The fact that creative thinking skills are still low, especially elaboration, makes efforts to develop them a priority along with efforts to improve students' habits of mind.

METHODS

This research is survey research conducted in Kampar Regency, Riau, Indonesia. The research took place from 23 March 2022 to 23 June 2022. The population of this study was all grade VII students of SMPN and MTsN in Kampar Regency for the 2021/2022 school year, totaling 10,403 students from 88 schools (Kemendikbud., n.d.). A research sample is needed given the large population size. The sampling method used in this research is the stratified proportional random sampling technique. The magnitude of the sample size was calculated based on the Krejcie & Morgan, (1970) formula. Based on this formula, the minimum sample size in this study was 377 students of SMPN and MTsN in schools conducted in the area of Kampar Regency.

Students from 88 schools were randomly selected to be part of the research sample. Then the subgroup categorization into three, namely A, B, and C based on school accreditation strata. The student population is 10,403 where the details are obtained 62% or 6432 are many students in schools with A accreditation from 52 schools, 34% or 3542 are many students in schools with B accreditation from 25 schools, 4% or 429 are many students in schools with C accreditation from 11 schools in SMP and MTs Kampar Regency. Ten schools were found to be the place of research and then from each category was randomly selected to determine a random class whose students were used as research samples. The sample size of each school category in Kampar Regency can be seen in Table 1.

Table 1. Student sample size by school accreditation

No.	Research Schools	Accreditation	Sample size
1	School A	A	63
2	School B	A	94
3	School C	A	63
4	School D	A	64
5	School E	A	67
6	School F	B	17
7	School G	B	60
8	School H	B	54
9	School I	C	27
10	School J	C	10
	Research Sample Size		519

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Data collection in this study was carried out using tests and questionnaires. The processing time is 1 hour 10 minutes for the mathematical creative thinking ability test and 15 minutes to fill in the habits of mind questionnaire. The written test instrument consists of 4 items that are arranged based on 4 indicators of mathematical creative thinking ability. Each item represents each component of creative thinking ability, namely fluency, flexibility, originality, and elaboration, each item measuring one indicator. The habit of mind questionnaire consisted of 40 statement items with a Likert scale (five response options) prepared based on the dimensions of habits of mind proposed by Marzano et al., (2006) with detailed indicators described by Costa & Kallick, (2008). Details regarding the distribution of each domain and indicators for each dimension of habits of mind can be seen in Tabel 2.

Table 2. Components and indicators of habits of mind

Components	Indicators
Self Regulated Learning	a. Don't give up and keep persevering b. Build morality. c. Empathy in listening to other people's opinions. d. Dare to take responsibility and face risks. e. Eager to respond.
Critical Thinking	a. Strive to work carefully and precisely. b. Think and communicate clearly and precisely. c. Ask questions and pose problems effectively. d. Utilise the senses in collecting and processing data. e. Metacognitive thinking. f. Interdependent thinking.
Creative Thinking	a. Flexible thinking. b. Utilising previous experience to acquire new information. c. Discovery, imagination, and creation. d. Humourist (Costa & Kallick, 2008). e. Continuous learning.

The validity of the instruments used in this study is shown by content validity and construct validity. the creative thinking ability diagnostic test instrument only uses content validity using V Aiken, (1985) coefficient, while the student habits of mind instrument in the form of a questionnaire uses content validity and construct validity which refers to the instrument to be measured by the procedure from Allen & Yen, (1979). The results of the trial conducted resulted in an estimated reliability coefficient of 0.816 for the mathematical creative thinking ability instrument and 0.847 for the habits of mind questionnaire. Thus, the three instruments used in this study have met the minimum standards of good instrument reliability (Ebel & Frisbie, 1973). Then proceed with the calculation of SEM (Standard Error of Measurement) which refers to the formula of Allen & Yen, (1979).

In this study, quantitative-qualitative analysis was used as a data analysis technique. This analysis was used in order to get a detailed description of the difficulties in solving mathematics problems based on mathematical creative thinking ability and how if seen from the cognitive style and habits of mind of students in the process of solving mathematical problems. The results of solving mathematical problems based on mathematical creative thinking ability and its percentage based on habits of mind were analyzed using a quantitative approach before qualitative data analysis based on Milles and Huberman (Ridwan Abdullah Sani, 2018). The results of students' habits of mind scores were categorized according to the interval scale conversion (Azwar, 2016). There are 3 stages in analyzing data in this study, among others; a) Collect and formulate data including analysis of habits of mind based on scale criteria, examine the results of student answers by looking at difficulty criteria, and grouping scores from habits on difficulty analysis; b) Analyze more deeply into a narrative form where each question is the target of data analysis to determine student difficulties; c) Draw conclusions where the reduced data is then presented with a qualitative approach to describe the type and location of student difficulties and the description of difficulties from the habits of mind criteria.

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RESULTS AND DISCUSSION

Descriptive quantitative

Types of student difficulties in solving mathematics problems overall.

In general, the analysis of the types of student difficulties in solving mathematical creative thinking ability questions through diagnostic tests based on Newman Errors Categories (NEC) adapted through research needs include; 1) difficulties in understanding the problem; 2) difficulty in transforming the problem; 3) problem processing difficulties; and 4) difficulty to encoding. Data regarding the number of difficulties experienced by students in full can be seen in Table 5.

Table 3. Percentage of student difficulty types

Type of Difficulty	**Quantity**	Percentage
Understanding Problems (A)	732	35,26
Transforming Problems (B)	1116	53,76
Mathematical Process (C)	1129	54,38
Encoding (D)	1138	54,82
Totally	**4115**	**49,55**

Table 3 shows each student who has worked on four items of mathematics problems based on creative thinking skills so that a total of 2076 student work is obtained with a maximum number of difficulties of 8304. Overall, the type of difficulty based on student work in solving mathematics problems is 49.55% of the total maximum difficulty, so it can be seen that there are still many mistakes that occur, especially in encoding. The mathematical process and encoding are the types of difficulties that dominate in solving the tested problems.

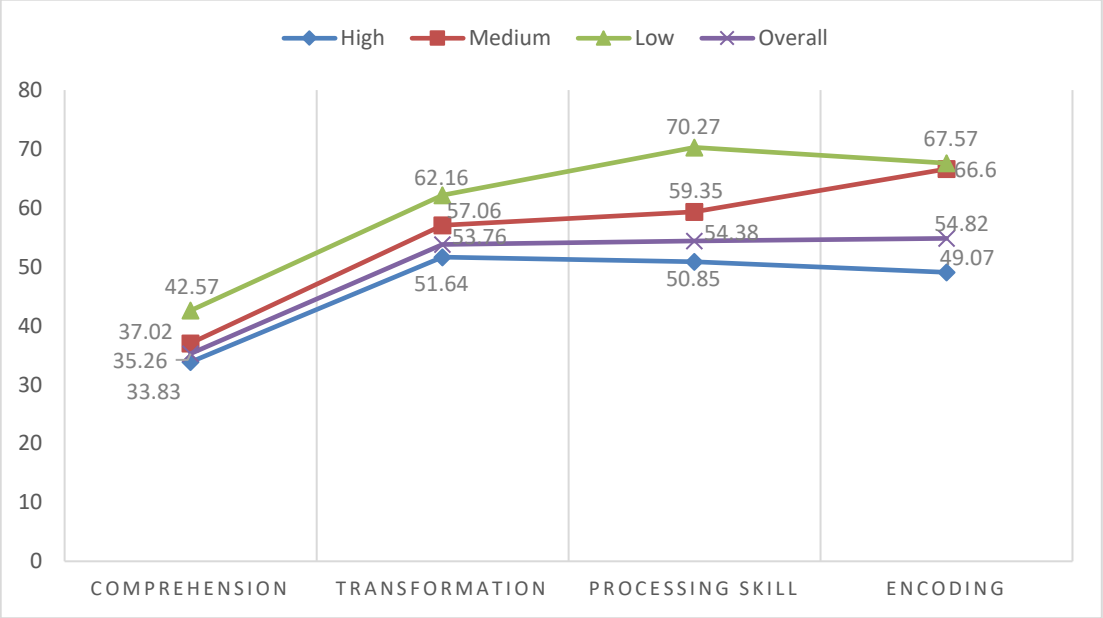

Figure 1. Types of student difficulties at 3 strata

Figure 1 shows that the medium and low strata occupy the highest percentage positions in various types of difficulties above the overall average where the type of difficulty in understanding the problem is the lowest level of difficulty compared to others.

Then in the difficulty in the process of solving mathematics problems based on mathematical creative thinking ability, information is presented about the results of student answers in each stratum, be it high, medium, or low strata. The following will show the percentage of answers of high strata students with 351 students participating in the study.

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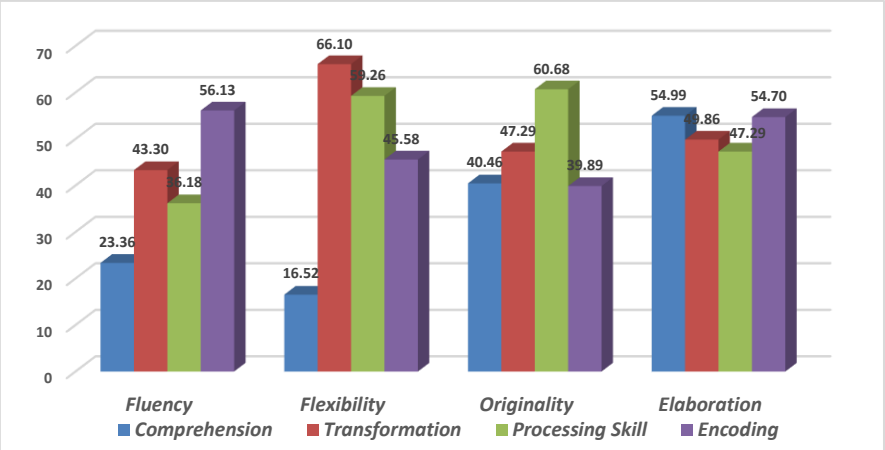

Figure 2. The percentage at higher strata

This presentation explains that the percentage level of difficulty of question items number one to question item number four varies. In the type of difficulty in encoding, the dominant percentage level is the fluency aspect. Regarding the type of difficulty in transforming the problem, the flexibility aspect gets the highest percentage level. The originality aspect gets the highest score for the type of difficulty in solving problems mathematically, while the elaboration aspect gets the highest score for the type of difficulty in understanding the problem. When viewed from all things done, the types of difficulties most often encountered by high strata students are difficulties in transforming problems and difficulties in mathematical processes.

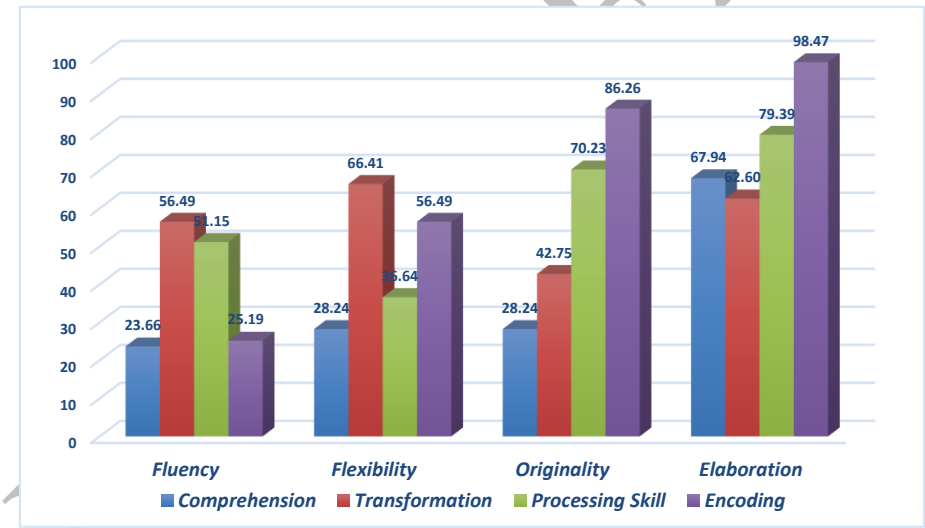

Figure 3. The percentage at medium strata

The highest type of difficulty is difficulty transforming the problem from question items number one and two. The highest level of difficulty is difficulty encoding seen in question items number three and four. The lowest level of difficulty, namely difficulty in understanding the problem, is owned by question items number 1, 2, and 3, while item 4 has a higher level of difficulty in understanding the problem than other aspects. When sorted by percentage of difficulty, difficulty in determining encoding, difficulty in transforming the problem, difficulty in mathematical processes, and difficulty in understanding the problem ranks from highest to lowest in moderate strata students.

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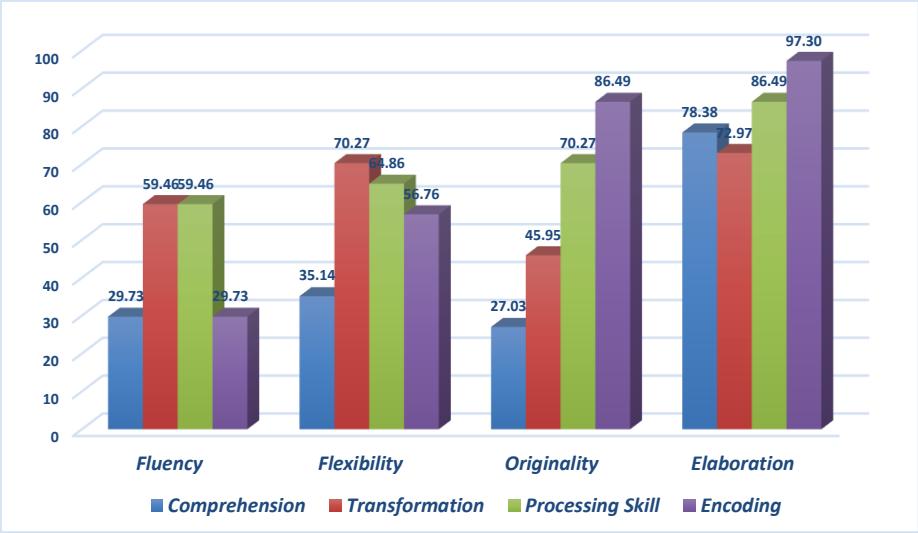

Figure 4. Percentage at low strata

The highest type of difficulty is difficulty transforming the problem from question items number one and two. The highest level of difficulty is difficulty encoding seen in question items number three and four. The lowest level of difficulty, namely difficulty in understanding the problem, is owned by question items number 1, 2, and 3, while item 4 has a higher level of difficulty in understanding the problem than other aspects. When sorted by percentage of difficulty, difficulties in encoding, difficulties in transforming problems, difficulties in mathematical processes, and difficulties in understanding problems rank from highest to lowest in moderate strata students.

Students' habits of mind in the process of solving mathematics problems

The habit of mind questionnaire was given to seventh grade students who were divided into three strata groups: high, medium, and low. The following table provides an overview of students' habits of mind in each stratum based on the measured data.

Table 4. Distribution of habits of mind criteria of students in each school strata

Criteria	Stratum						Number of students	percen -tage
	High		Medium		Low			
	f	percent -age	*f*	percent - age	*f*	percent -age		
Very high	23	6,55	5	3,82	3	8,11	31	5,97
High	69	29,66	29	22,14	10	27,03	108	20,81
Medium	154	43,87	55	41,98	13	35,14	222	42,77
Low	91	25,93	36	27,48	9	24,32	136	26,20
Very low	14	3,99	6	4,58	2	5,41	22	4,24
Total	**351**		**131**		**37**		**519**	

The frequency and percentage of students' habits of mind in each stratum in Kabupaten Kampar vary. Table 4 shows that the number of students in the very high and high criteria is a fairly large difference of 46 students, while between the very high and medium criteria, there is a very large difference of 131 students. Then for the difference between very high and low and very low criteria, the difference is 68 and 9 students respectively. Of the three strata, both high strata, medium strata, and low strata, the most dominant criteria lie in medium strata students with low criteria.

The average habits of mind of students can also be described based on the habits of mind criteria on all indicators of habits of mind in this study. This is coupled with the frequency distribution and percentage of students' habits of mind criteria in each stratum. The following will show all the details of each indicator of the habits of mind about how curious from the analysis results that students fill in the questionnaire sheet.

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Table 5. Description of average student habits of mind on all indicators in each category.

Indicators	Average			Overall Average
	High	Medium	Low	
Indicator 1	3,07	2,90	2,96	2,98
Indicator 2	3,14	3,07	3,03	3,08
Indicator 3	3,13	2,99	3,12	3,08
Indicator 4	3,16	2,93	3,00	3,03
Indicator 5	3,07	3,07	3,11	3,09
Indicator 6	3,12	3,06	2,93	3,04
Indicator 7	3,10	2,98	3,01	3,03
Indicator 8	3,12	2,87	2,76	2,91
Indicator 9	3,10	2,87	3,27	3,08
Indicator 10	3,00	2,79	2,89	2,90
Indicator 11	3,10	3,10	3,12	3,11
Indicator 12	3,03	2,92	3,29	3,08
Indicator 13	3,05	3,09	2,84	2,99
Indicator 14	3,03	3,02	3,01	3,02
Indicator 15	3,12	2,89	2,95	2,99
Indicator 16	3,05	3,12	2,89	3,02
Total	49,39	47,68	48,17	48,42

Based on table 5, it can be obtained information that the highest average number of students' habits of mind is in indicator 11, namely creating, imagining, and innovating which is included in the creative thinking aspect, while the lowest students' habits of mind are in indicator 10, namely utilizing the senses in collecting and processing data which is included in the Critical Thinking aspect.

The following also presents an overview of the data on the percentage of types of difficulties experienced by students in each category of habits of mind in solving mathematics problems based on mathematical creative thinking ability.

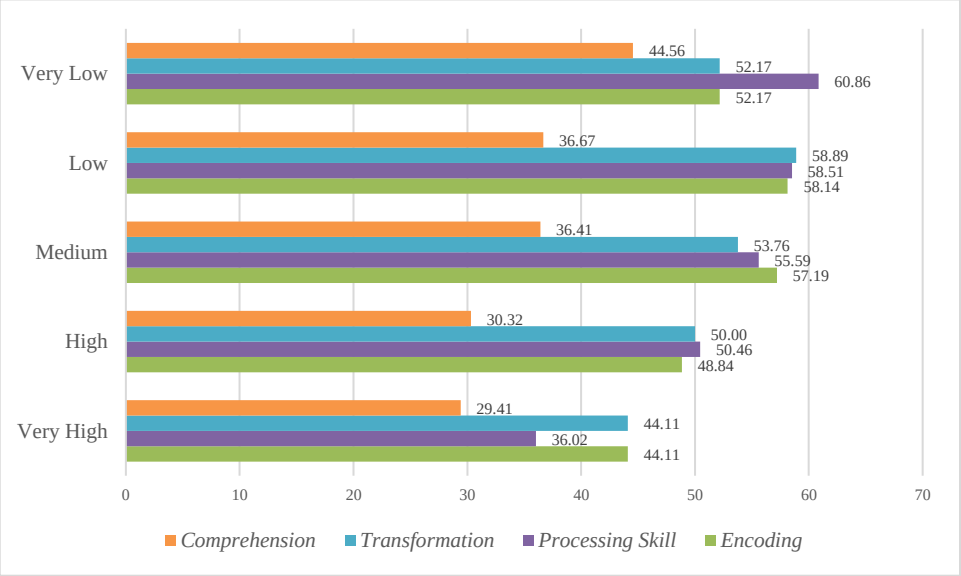

Figure 5. Percentage diagram of student difficulty types in each habit of mind category

Each category of habits of mind obtained a different dominant percentage. When viewed from the percentage, students with very high and high habits of mind categories are the categories that find the least difficulty in solving mathematics problems based on mathematical creative thinking ability.

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Descriptive Qualitative Data

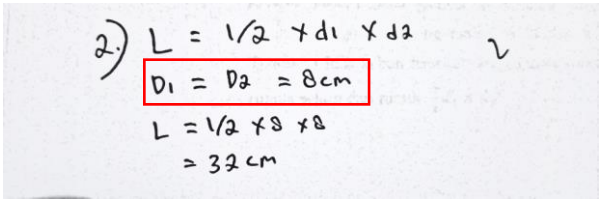

Figure 6: Students' difficulty in determining what information is known

Based on Figure 19, it can be seen that students experience errors in determining the known information. At the time in the field, it was found that many students knew that diagonal 1 and diagonal 2 were the same as drawn $d_1 = d_2 = 8$. However, it has been mentioned in the questionnaire that diagonal one and diagonal two are 6 and 8 respectively, causing the problem solving to be wrong.

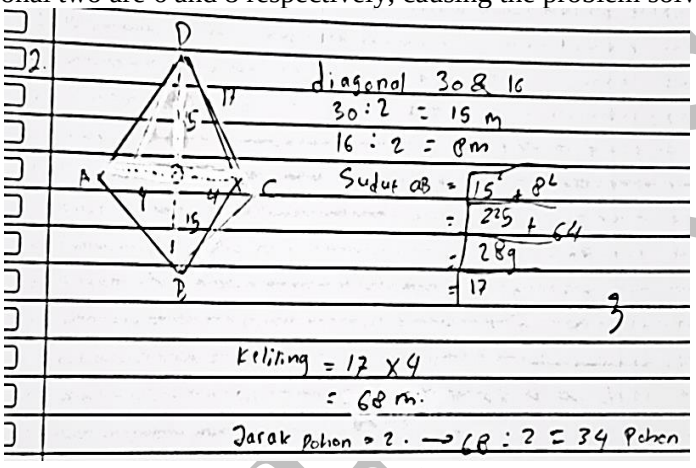

Figure 7. Students' difficulty in transforming the problem

Students still seem to have difficulties in problem transformation. Students should have written the triangle area formula or other areas that would answer the question from the problem, but instead they chose the angle formula. This is because most students only know one rhombus formula, but what is asked from the problem is other than the rhombus area formula and even forget the material from the question tested. Students have not been able to correctly identify the information provided by the problem.

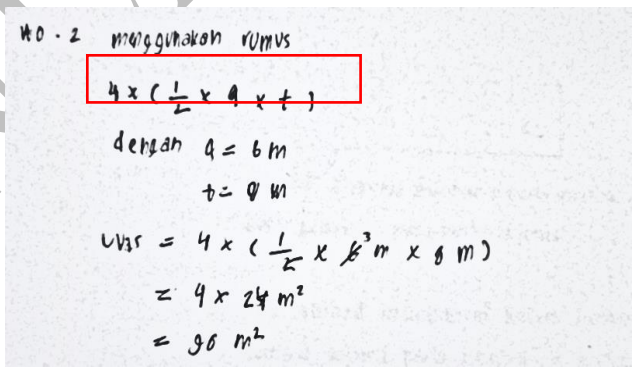

Figure 8. Student difficulties in the maths process

Students are correct in determining the formula and in the process of using it, but students are wrong in performing mathematical calculation operations and are not clear in writing. For example, the value of $\frac{1}{2} \times 6 \times 9$ is not 24 but 27. So it can be seen that the difficulty has occurred in determining the known information. This can be caused because students are less careful and rush in the process of working on it.

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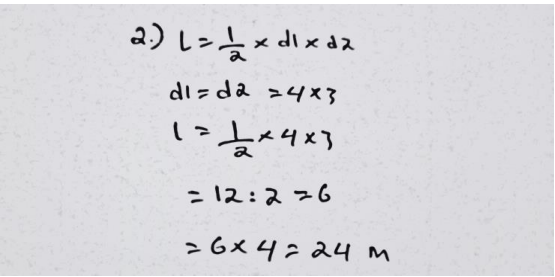

Figure 9. Student difficulties in determining encoding

Students have difficulty figuring out the correct answer. It is difficult to ascertain the correct answer due to the ambiguity of the mathematical process that students perform. Students who are not used to drawing conclusions after getting answers and not being careful in understanding what information is asked can also contribute to this difficulty. So it appears that students have difficulty in encoding as seen from question item two in the flexibility aspect.

Discussion

Students' difficulties in solving maths problems as a whole

When problems are difficult to understand, some students tend to write down the principles of what information they know only. According to Cooney et al., (1975) some students have a tendency to memorise principles as facts. This means that students read the question without really understanding it so that their inability from writing what they know from the question. So that literacy activities are not only reading, but also interpreting and responding to the truth of information and applying it in everyday life (Jailani et al., 2020). Students' literacy in understanding questions is important for the development of students' mindset (Muhazir et al., 2021). Angateeah, (2017) added that most students can read problems, but there are still difficulties in developing the structure of the problem correctly due to the inability of students' minds. The better students are at their skills in reading activities, the more able students are to understand mathematical problems, so that the effect on students' academic performance will be greater.

The difficulty in transforming can be understood from the work of students who do not know the formula by students until the determination of the formula and the model used is still wrong. This is said by Cooney et al., (1975) that difficulties in the use of concepts are characterised by students' inability to remember technical names and inability to state the meaning of a term, this has a lot to do with student errors when determining the formula used. In understanding the problem is also an inhibiting factor and affects the way students transform the problems that students do. Without an understanding of concepts and numeracy skills, students will experience difficulties in solving mathematics. Students' difficulties in solving mathematics are seen if students write rules and manipulate symbols by memorising. In line with Kaleli-Yılmaz et al., (2016) explained that if students still rely on the memorisation process, then students will have difficulty in applying their knowledge, especially in the reasoning process.

Difficulties in the mathematical process are most dominant in the originality aspect with indicators related to novelty and uniqueness of solutions with a percentage of 63.78%. This is due to the tendency of students to memorise the steps without understanding the concepts used in solving the problem. According to Cooney et al., (1975), students who memorise principles as facts and are unable to abstract patterns have a tendency not to understand the principles and cannot determine the things that are interrelated from both. Meanwhile, Chusnul. et al., (2017) revealed that difficulties in process skills have been seen after selecting and writing the formula correctly, but performing the operation incorrectly.

The difficulties experienced by students in determining encoding are also caused by one of them processing information about what is asked in the problem. Students' uncertainty with the work obtained and lack of time in checking the answers again are the dominant locations of difficulties from students' statements. Hansen et al., (2017) added that errors occur due to students' inability to encode what has been obtained. Cooney et al., (1975) revealed again in detail where difficulties occur due to students not checking back answers and not being able to reason the right answers from the various answers that are thought up.

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Students' difficulties in solving maths problems based on habits of mind

Based on the results of the study, student difficulties were obtained from student answer sheets grouped based on their respective Habits of Mind (HoM) in solving mathematics problems based on mathematical creative thinking skills. The difficulties experienced in solving mathematical problems based on mathematical creative thinking skills are in habits of mind with low and very low categories with percentages of 53.06% and 52.45% respectively. Then the highest percentage of difficulties that occurred in the very low category of habits of mind that experienced difficulties in the mathematical process was 60.86%. In the low category habits of mind experience dominant difficulties in transforming problems. In the medium category habits of mind experience dominant difficulties in determining encoding. In the high category habits of mind experience dominant difficulties in difficulties in the mathematical process. Habits of mind in the very high category had the highest percentage of difficulty in transforming problems and determining encoding, both of which obtained a percentage of 44.11%. This indicates that the level of the habit of mind directly affects the level of student difficulty where Habits of mind have an important role in problem-solving with 67.40% contribution, especially in students' mathematical creative thinking skills so it is required that teachers can develop aspects to improve student abilities (Asih Vivi Yandari et al., 2019; Sumartini, 2022).

From the results of the interviews conducted, it was found that lack of accuracy and confusion in determining the known information from the problem were the factors that caused students to have difficulty solving problems. Other factors that cause students to experience difficulties in solving mathematics problems are students' inattention in determining and using mathematical formulas and models, weaknesses in arithmetic operations in mathematics, especially in multiplication and division, students' pessimism about problems that are considered difficult to solve to the point of students' huntiness and feelings of lack of time in working on problems. This is in line with research from Lubis et al., (2021) which states that the factors that cause difficulties experienced are haste, lack of accuracy, errors in the skill process, misunderstanding, not understanding the material, and reading errors.

CONCLUSION

The results showed that the types of difficulties experienced by students were: 35.26% had difficulty in understanding the problem, 53.76% had difficulty in transforming the problem, 54.38% had difficulty in the mathematical process, and 54.82% had difficulty in determining encoding. Difficulty in understanding the problem lies in errors in determining what information can be known and asked and not being accustomed to writing what is known and what is asked in the problem, difficulty in transforming the problem lies in the inability to determine the mathematical formula to be used and the mathematical model of the problem tested, difficulty in mathematical processes lies in confusion in connecting mathematical symbols made and incorrectly performing mathematical arithmetic operations, difficulty in encoding lies in confusion in writing or concluding encoding. This is because when starting to work on the problem there are still students who do not write what is asked from the problem. when viewed from the habits of mind, student difficulties in the very high category were 38.42%, high category was 44.91%, medium category was 50.74%, low category was 53.06%, and in the very low category was 52.45%. The implications obtained in the research process where future researchers can examine other factors that influence the difficulties experienced by students in solving mathematics problems such as mathematics anxiety, cognitive load and so on, educators should diagnose and pay more attention to the types of student difficulties in solving mathematics problems based on mathematical creative thinking ability so that the factors that cause the difficulties experienced by these students are identified and ultimately can provide more meaningful learning solutions. On the other hand, educators are required to help as a facilitator of students by understanding the cognitive style of each student and increasing students' habits of mind.

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