



DIDACTICAL SITUATION ANALYSIS OF MATHEMATICAL LITERACY COMPETENCE OF GRADE VIII STUDENTS OF JUNIOR HIGH SCHOOL 2 BONTONOMPO SELATAN ON DATA AND UNCERTAINTY CONTENT

Andi Kusumayanti¹, Nurul Fajri Ninsih², Putri Wulandari Kadir³, Rahmawati Arfah⁴, Sri Ananda Putri⁵, & Andi Ika Prasasti Abrar⁶

^{1,2,3,4,5,6}Universitas Islam Negeri Alauddin Makassar

Correspondence Email: andi.kusumayanti@uin-alauddin.ac.id

ABSTRACT

This research seeks to reveal the didactical situation based on the theory of didactical situation on statistics material related to students' mathematical literacy competencies on data and uncertainty content and examine the learning barriers experienced by students in having mathematical literacy competencies on data and uncertainty content. This research is a descriptive qualitative research, with the research subjects are students of class VIII.B of Junior High School 2 Bontonompo Selatan. Data collection techniques using test, observation, and interview techniques, this research instrument uses tests, observation guidelines, and interview guidelines. The test used in the form of essay questions as many as 5 numbers related to mathematical literacy of data and uncertainty content. The results showed that the didactical situation in learning statistics in class VIII.B of Bontonompo Selatan Junior High School 2 was poorly implemented. The didactical situation that occurs is still minimal in supporting students' mathematical literacy competencies in data and uncertainty content. In addition, it can be seen from the various situations contained in the theory of didactical situations that are not maximally implemented such as formulation, action, validation and institutionalization situations. It was also found that there were learning obstacles where educators were only directly given an explanation of statistical material but students were not invited to understand contextually so that concepts could be conveyed. Learning experienced by students in order to have mathematical literacy competence in data and uncertainty content, namely epistemological obstacles, namely the knowledge that exists in students is still difficult to apply to similar problems but in a different form and didactical obstacles, namely this learning

obstacle occurs because the presentation of learning materials pays less attention to things that are contextual to the lives of students and students are less actively involved in learning..

Keywords: Didactical analysis; mathematical literacy; learning obstacles

1. INTRODUCTION

Indonesia is a country rich in natural resources. However, this wealth will not maximally advance Indonesia if it is not in the right hands. Indonesia as a legal state emphasizes the education sector as a maximum effort to advance the country (Arwildayanto et al., 2018). Education comes from the root word educate. In the Big Indonesian Dictionary (KBBI) the word educate is defined as the process of "maintaining and providing training (teachings, demands, leaders) regarding the morals and intelligence of the mind". Meanwhile, in the Roman language, education is defined as educate, namely improving morals and training intellectually (Yusuf, 2021). Education in the Legislation on the Education System No.20 of 2003, states that Education is "a conscious and planned effort to create an atmosphere of learning and learning so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character and skills needed by themselves and society". In a broad sense, the definition of education is life. This means that education is all the knowledge that each individual gets throughout his life in all places and situations that have a positive impact on him (Pristiwanti et al., 2022). Based on the description above, it can be concluded that education is a conscious and planned effort to gain knowledge without being limited by space and time in the self-development of each individual.

Education in Indonesia is still far from perfect, because there are still many students who have difficulty in understanding and solving problems in several materials including statistics. The results of research conducted by Lestari, Hartoyo, dan Suratman (2020) state that there are still many students who have difficulty solving statistical problems in more than one way, and are less familiar with the forms of problems so they do not understand the information in the problem. Meanwhile, the results of research by Sumita, Jamilah, dan Muchatadi (2022) state that the tactical situation based on TDS that occurs in the learning process is not well implemented, because in the action situation there is no feedback between the learning process and students that occurs, then in the formula situation students are unable to find the right way or strategy. In addition, there is no validation situation carried out by the teacher and the institutionalization situation also tends to the teacher who must explain many times to students before students begin to understand the lesson.

In the learning process, students often experience learning obstacles. Learning obstacles or those experienced by students in learning subject matter, are categorized into three types according to Brousseau in Rohimah (2017), namely: (1) ontogenic obstacle, which is the mismatch between the learning provided and the level of thinking of students, thus creating difficulties in the process of understanding the material. If the level received by students is too low, students will not experience the real learning process, on the other hand, if the level received by students is too high, then students will experience difficulties and even dislike math because it is difficult (Lutfi et al., 2021). (2) epistemological obstacles, namely difficulties in the learning process that occur as a result of the limited context that students know. In this case, students only receive a partial understanding of the concept, so that when faced with a different context students have difficulty using it (Roth, 2019). (3) didactical obstacles, namely difficulties that occur due to learning by teachers (Andani et al., 2021). As stated by Jatisunda & Nahdi (2019) that this incomplete understanding of the concept will later lead to learning obstacles or what is known as learning obstacles.

Statistics is one of the materials in the even semester of grade VIII of junior high school. Statistics is a branch of mathematics that studies data, how to collect data, process data, analyze, interpret data, and present data (Huwaida, 2019). The learning objectives to be achieved by teaching this material are that students can understand, analyze, interpret, and make conclusions related to information obtained from the problems given (Sutopo & Slamet, 2017). In addition, it is also expected that students can determine concepts in solving existing problems. Therefore, habituation is needed to increase students' knowledge by providing exercises in the form of problems, analyzing what information the problem provides, and also its application in everyday life (Wildani et al., 2019). In order for the learning process to run well, of course, a series of planned and systematic activities are needed.

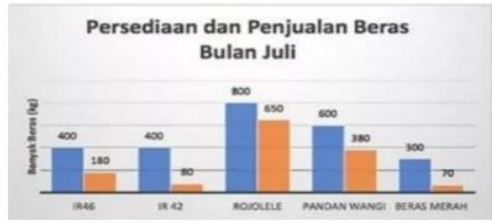
The flow in the learning process does not always go well due to several possibilities. First, the structural relationship (concept linkage) with functional (thinking process linkage) between situations developed is not always based on the results of in-depth analysis according to the tendency of learner characteristics. As a result, the reflection process between teachers and students in the learning process is hampered, this is what causes the didactical obstacle situation. Second, the implementation of didactical situations in the learning process in the classroom does not always suit the needs and circumstances of students, where the stages are too detailed so that they have an impact on the rapid emergence of boredom and stages with unclear flow resulting in the emergence of disconcentration of thinking that can complicate the situation so that sometimes they feel frustrated in learning (Suryadi, 2019). In delivering learning materials, education should pay attention to the relationship between concepts and the thinking process of students.

Didactics is essentially the art of creating situations that can facilitate the learning process for students. Didactical obstacles are learning barriers that are related to the sequence or stages of material delivery that result in learners' understanding of the material being taught less precisely (Ruli et al., 2022). The choice of starting point to begin the learning process to determining the final didactical stage needed to facilitate children's thinking process, as well as determining the final stage of the learning process will only be well designed through repersonalization activities. The situations and series of situations created by educators certainly have a non-simple impact on a person's thinking process both on meaning, the emergence of mental actions, the construction of thinking flows, the acquisition of understanding, validation of understanding, and strengthening understanding (Suryadi, 2019). So it can be said that the didactic situation is a situation given by educators to students in delivering material.

Didactical mathematics is integrated in TDS, inspired by mathematical game theory, to investigate scientifically the problems related to mathematics learning and how to improve the quality of mathematics learning. The effectiveness of didactical situations is that learners have a teacher-given responsibility to solve problems. In solving problems learners are given the freedom to construct their own knowledge (Radford, 2008). Brousseau (2002) identified four types of situations namely action, formulation, validation, and institutionalization. These four situations should ideally be included in a learning process. However, the important thing to remember is that the main purpose of learning is to ensure that students can understand the teaching material well without experiencing a learning barrier.

Based on observations made by researchers at Junior High School 2 Bontonmpo Selatan class VIII.B, information was obtained that students still had difficulty in solving the statistics problems given. The results of giving one of the PISA questions on data and uncertainty content gave the following results:

Seorang pemilik toko beras, akan membeli beras untuk persediaan barang pada bulan berikutnya. Penjualan beras untuk bulan Agustus diperkirakan sama dengan penjualan bulan Juli. Sebelum membeli beras, pemilik toko membuat catatan tentang persediaan beras dan beras yang terjual dalam bulan Juli yang disajikan dalam bentuk diagram batang berikut.



A rice shop owner will buy rice to stock up for the following month. The sales of rice for August are expected to be the same as the sales in July. Before buying the rice, the shop owner makes a note of the rice inventory and the rice sold in July which is presented in the form of the following bar chart.

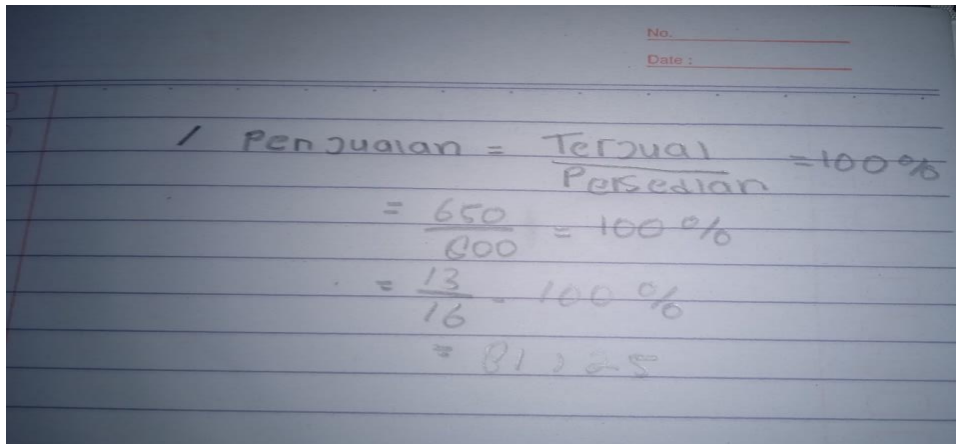


Figure 1. PISA Problem and Student's Answer Observation Results

The results of students' answers are still wrong, in the problem given the most sales results are 650 kg, namely the type of rojelele rice. While the students' answers divide the most sales by inventory and then multiply by 100%. This indicates that students experience learning obstacles that cause them difficulty in solving the problem. Based on this, the researcher is interested in conducting research with the title "Didactical Situation Analysis of Mathematics Literacy Competence of Class VIII Students of Junior High School 2 Bontonompo Selatan on Data and uncertainty content".

2. METHODS

This research is a type of descriptive research, which is research that provides a description of the various characteristics of individuals or groups, circumstances, and

certain symptoms as they are (Saat & Mania, 2020). Descriptive research will provide a description of an event, incident, or symptom that occurs with a focus on the existing problem. So this research will clearly observe and describe the didactical situation in statistics material related to students' mathematical literacy competencies in data and uncertainty content. This research uses a qualitative approach. Qualitative research aims to understand the phenomena that occur in research subjects (Sidiq & Choiri, 2019). This research will analyze the didactical situations that occur in learning on statistics material based on the theory of didactical situation (TDS), namely action situations, formulation situations, validation situations, and institutionalization situations. In addition, students' learning barriers in statistics related to mathematical literacy in data and uncertainty content will also be identified.

This research was conducted at Junior High School 2 Bontonompo Selatan which is located in Bontoramba Village. Bontonompo Selatan District, Gowa Regency. The data source in this research is primary data, which is obtained directly from the source without going through intermediaries. In this study, data sources were obtained directly from the research location, namely students of class VIII.B Junior High School 2 Bontonompo Selatan. The steps in this research, namely:

1. Make initial observations by giving mathematical literacy questions about data and uncertainty content to get initial information about students.
2. Conducting didactical situation analysis based on the theory of didactical situation (TDS) which is divided into 4 situations, namely action situations, formulation situations, validation situations, and institutionalization situations.
3. Giving mathematical literacy test questions on data and uncertainty content to students.
4. Analyzing learning barriers experienced by students.

Data collection techniques using test and non-test techniques. The test technique is used to measure the mathematical literacy competence of students on data and uncertainty content with the aim of obtaining information about the completion of the problems given to students and then analyzing the learning obstacles experienced by students through solving the questions. For non-test techniques, observation and interviews were conducted. Observation is used to find out the didactical situation that occurs during statistics learning and is used to obtain information about students' obstacles in learning related to data and uncertainty content apart from the results of problem solving analysis. Interviews were conducted to obtain more in-depth information about the didactical situation and learning barriers. The instruments used were test instruments in the form of questions to measure mathematical literacy competence on content and uncertainty in the form of 5 essay questions and non-test instruments in the form of observation and interview guidelines.

The data analysis technique used uses the Miles and Huberman model data analysis technique, namely data reduction, data presentation, and conclusion drawing (Murdiyanto, 2020). Data analysis is the process of systematically searching and compiling data obtained through interviews, as well as other materials so that it is easier to understand and the information can be digested properly by others (Rijali, 2018). Data reduction is an activity of selecting, paying close attention and transforming the rough data obtained at the research location to classify and sharpen it and discard unwanted things to make it easier to interpret. So that in this data reduction, we will look for data that is truly valid. Data presentation is carried out in order to present the information obtained after data reduction so that it can be easily concluded, where in this study the data presentation is in the form of narrative text. Conclusions are drawn to understand the meaning of or cause and effect of an event or research. Testing the validity of the data using triangulation to check data with different techniques but from the same source, namely through observation, interviews, and tests of mathematical literacy competence in data content and inequality (Mekarisce, 2020). The results of the suitability of the three techniques will produce more valid data.

The indicators of mathematical literacy skills are as follows:

Table 1. Indicators of mathematical literacy skills (OECD, 2019)

No	Indicator	Description
1	<i>Communication</i>	Read, write, analyze and interpret, and formulate problems.
2	<i>Mathematising</i>	Transforming real-world problems into mathematical form, interpreting mathematical results and mathematical models in relation to the original problem.
3	<i>Representation</i>	Present problems in the form of graphs, tables, diagrams and drawings.
4	<i>Reasoning and argument</i>	A logical thought process that leads to conclusions, checking and justifying statements or solutions to problems.
5	<i>Devising strategies for solving problems</i>	The ability to design a strategic plan and execution process to use math as problem solving.
6	<i>Using symbolic, formal, technical language and operation</i>	Use of formal language and symbolic, technical operations involving understanding, interpretation, manipulation and use of symbolic expressions in a mathematical context (including arithmetic expressions and operations).
7	<i>Using mathematical tools</i>	Know how to use math tools to help solve math problems.

The indicators of mathematical literacy of data and uncertainty content are as follows:

Table 2. Indicators of mathematical literacy of data and uncertainty content

Basic Competencies	Indicators
Present and solve problems related to data distribution, mean, median, and mode values	Learners are able to present data in a table Learners are able to determine the average (mean) of a data set Learners determine the median and mode of a data set Learners are able to solve problems related to daily life related to data distribution, mean, median, and mode values.

3. RESULTS AND DISCUSSION

Researchers conducted learning observation activities on statistical material in class VIII.B by observing the ongoing learning by becoming a silent observer. The learning model used is still a conventional learning model using blackboard media in delivering the material. The teaching material used by the teacher is a math textbook provided by the school published by the Ministry of Education.

The results of observing learning activities, giving tests, and interviews provide the following findings:

1. Action Situation

In this situation, students have a role to be able to find solutions to the problems given by making decisions in order to determine how to solve and the strategies used (Faudiah, 2021). Then, the teacher's role is to convey information to students and present contextual problems to support students' mathematical literacy in data and uncertainty content in statistics material.

The results of observations and interviews provide some findings from the action situation:

- a. Learning that is started by the teacher does not provide contextual problems to students, only directly provides an explanation of statistical material but students are not invited to understand contextually so that concepts can be conveyed. Even so, the teacher's explanation for statistical material is generally quite good and

patient in delivering the material, it's just that it doesn't start by providing contextual problems, especially those that can support to improve students' mathematical literacy competencies. Students are also difficult to memorize and apply formulas, the formulas used by students tend to be memorized without knowing the concept well. This is also the cause of the low competence of students in identifying problems in mathematical literacy questions on data and uncertainty content in statistics material.

- b. Examples of problems given to students do not support students' mathematical literacy competencies, especially data and uncertainty content because the problems given are only ordinary data without involving mathematical literacy. It can be seen when students are told to work on problems, they will find it difficult to solve the questions and the results of interviews obtained information that the material taught is considered difficult by students. Therefore, students have difficulty when solving problems.
- c. Learners lack high interest in working on problems on the blackboard if invited and learning is dominated by the teacher.

Based on some of the points above, it can be seen that at the beginning of learning, students must be exposed to real concepts about statistics and contextual problems. Problems that are relevant to the lives of students will be easier for students to understand. The lack of integration of questions and presentation of material that can support students' mathematical literacy in data and uncertainty content also causes difficulties for students when given questions related to mathematical literacy. The problems presented are only factual problems without being able to support students' mathematical literacy and are linked to contextual problems. The reason this can happen is because of the amount of material that must be conveyed while the learning time is insufficient. Then, the questions given by the teacher also do not really support students' mathematical literacy due to the lack of information about the importance of students' mathematical literacy, in line with the 2018 PISA results that students' mathematical competence in Indonesia is still lacking compared to other countries. Learners lack high interest because they do not really understand the material presented by the teacher and only accept the examples given without understanding the actual concept. The results of the interviews also provide information that students feel that they cannot do math and feel less intelligent to understand math, so that their interest in math subjects decreases. Teachers can innovate more active learning to attract students' attention and make students eager to learn and better understand the concept of mathematics to students and its benefits in everyday life.

Based on the action situation that has been described, the action situation that occurs in learning is the absence of stimulus or feedback for students to understand concepts, for example by providing contextual problems at the beginning of learning and explaining the purpose of learning the material presented so that it is not only an ideal concept but also contextually can be utilized by students. So, through this, students' interest will be provoked to focus on the mathematics material being taught and then instill the concept of statistics material through contextual problems faced by students. This stimulus is important to provoke students to think and enter the learning that wants to be conveyed. The existence of feedback from the teacher to students and vice versa will present two-way communication and not only focus on the teacher alone, so that the action that is created is interactive and not centered on the teacher alone. In addition, understanding concepts to students is also important to do so that there are no misunderstandings of concepts that occur for students to understand statistical material and solve statistical problems, both questions related to mathematical literacy content and data and uncertainty or other problems. If this can happen well, then students will be able to develop strategies by themselves, solve problems with less difficulty because they have understood the concept from the start.

2. Formulation Situation

In the formulation situation, the facilitator who helps learners solve problems is the teacher. The problems faced by learners must pay attention to the mathematical literacy competencies of data and uncertainty content because these are the knowledge demands that learners must acquire. This situation must be able to provide opportunities for students to express the strategies they want to use in solving problems through oral delivery so that they will be heard and understood by other students, discussed, and mutually agree and accept what is conveyed (Fauzi et al., 2020). The results of interviews and observations found that students were less able to solve the problems given and still relied on books or asked their friends. Learners tend to only be able to copy answers from their friends without conducting discussions to solve the problems given. The problems given to related to mathematical literacy problems on data and uncertainty content tend to still be wrong in solving the problem. Learners are less able to identify existing or confronted problems, so that the solution will also be wrong. Learners lack discussion and express the strategies they want to use or the steps they want to use in solving the problems given. Interviews with students provide information that he finds it difficult if the problem is related to mathematical literacy problems because he cannot identify the information properly and what problems he wants to solve in the given problem. The problems given to students are contextual problems, but due to the lack of discussion to get the right strategy in solving the problem, students will have difficulty because in action situations, students are not faced with contextual concepts and problems that can support

students' mathematical literacy competencies in data and uncertainty content in statistics material.

The formulation situation that should occur the teacher should be able to provide assistance to learners to be able to understand the given problem where the problem considers increasing mathematical literacy competencies and leading learners to be able to discuss and choose strategies in problem solving based on what has been conveyed by the teacher. Learners must be able to choose the right problem solving and solve the given problem by understanding the core or concept of the problem through expressing opinions and discussing them. Through discussions and arguing with each other to choose the problem solving of the given problem, learners will get various images and different points of view in solving the given problem. Thus, through this, learners will be able to choose the right solution based on the information presented in the problem. This not only trains students in improving mathematical literacy competencies, but also helps students to be able to reason creatively and train communication competencies. However, the application of this formulation situation has not happened well.

3. Validation Situation Analysis

The didactical situation involves learners to examine more deeply whether the estimates they make are the right solution to the problem given. The series of didactical situation analysis is done so that learners reflect back on their answer sheets to find the best solution to the problem. In completing a group task, learners in the group must have the same perspective because of the previous group discussion. In understanding a lesson, students often experience errors in understanding what is conveyed by the educator, so that in this validation situation analysis they are asked to review the knowledge they get whether it is in accordance or not with existing theory (Fuadiah, 2017). This stage functions so that educators really ensure that no students experience conceptual misunderstandings in using certain strategies in solving existing problems (Yuliana, 2017). At this stage, it is highly demanded by educators in explaining the right concept to students.

The teacher directs students to the didactical situation by using the right solution and strategy in solving the given problem and validating the problem solving used by students. However, based on the observations made by the author, it provides information that the validation situation has not gone well, because the teacher only directly explains the problem solving of the problem without validating whether the students' solution is correct or not. Based on students' worksheets on data and uncertainty content, it is obtained that the majority of students find it difficult to solve the literacy problems given, this is because students are not accustomed to solving PISA-like problems. Learners are only accustomed to being given factual questions, so in solving

literacy questions students still have difficulty in solving these questions. After students complete the problem, there is no validation carried out by the teacher regarding the answer so that no improvements are made by students. However, the teacher still explains related material if there are students who ask questions and have difficulty in solving the problems given.

Based on the questions given to measure the literacy of students where there are three questions presented. From the three questions presented, it can be concluded based on the answers of students and the results of interviews conducted by researchers that students are not yet familiar with literacy questions, it can be seen from most students who answer the average question that they have difficulty answering questions number one and number two which are indeed literacy-type questions. For question number three, it is presented in the form of rujin questions that are usually presented in textbooks, and it is found that the average learner can answer the question correctly. Based on this, it can be concluded that students do need to be familiarized with non-routine problems that require a high level of reasoning.

The results of several sheets of answers from the average learner from them answered incorrectly when working on the problem, the researcher suspected that this had occurred due to the lack of readiness of students to learn to solve the problem. It can be seen from the results of analyzing the answers of students that on average they cannot do questions number one and two correctly. They have difficulty in analyzing the name of the player with the highest number of goals and then writing it in tabular form and then determining the median and mode. Some students also admit that the questions are difficult to solve.

Based on the description above, this validation situation analysis serves to reflect back the knowledge possessed by students so that they really understand the concept of the material being taught. Educators are required to be able to revalidate students' worksheets in order to find out in which parts of the students have difficulty in solving the problem.

4. Institutional Situation

Learners do not learn mathematics well unless they have gone through the three stages of didactical situations (Brousseau, 2002). However, within the didactical situation, another situation may arise where learners can transform their prior knowledge into new knowledge reports with teacher guidance and reinforcement. This situation is called the institutional situation. In this situation, learners can use their newly acquired knowledge to solve other problems. But in practice, the didactic situation developed does not always run smoothly.

Learners sometimes fail to solve problems or even easily avoid them (Radford, 2008). Therefore, there will always be negotiations in the didactical situation where learners and teachers either explicitly or implicitly work as mutually responsible partners like a contract called the didactical contract. The didactical contract is determined by the didactical situation on which the meaning and meaning formation of a mathematical concept or term in learners depend. At some levels of education, meaning formation of a mathematical concept begins with explicit definition. However, in reality, meaning cannot be grasped completely from a definition, but must go through a series of learning processes that present various contexts (Sierpinska, 1994). Therefore, the didactical situation plays an important role in the formation of a mathematical concept in students. The implementation of good learning begins with careful teacher preparation in order to compile a learning design, namely didactic design.

An activity that can change students' knowledge into new knowledge through additional explanations from the teacher related to conveying the truth about a material which then the knowledge gained by students can be applied in solving problems appropriately. However, if we look at the formulation situation, students are still unable to be independent in solving the problems given. Often seen learners ask their friends or see their friends' work in solving the problems given. Here is an example of students' answers that have been reduced.

Timas Indonesia U-22 memetik kemenangan kedua di ajang SEA Games 2023 dengan berhasil mengalahkan Myanmar dengan skor yang telak. Sejauh ini, Timnas Indonesia U-22 masih berstatus sebagai tim dengan produktivitas gol tertinggi di SEA Games 2023. Menariknya, rekor istimewa ini hanya ditopang oleh lima pemain saja yaitu Fajar Fathur Rahman, Ramadhan Sananta, Marselino Ferdinan, Irfan Jauhari, dan Titan Agung. Dua nama terakhir menyumbangkan satu gol, Fajar dengan mencetak empat gol dari tiga laga, Sananta mencetak tiga gol, dan Marselino mencetak dua gol. Berdasarkan informasi diatas, sajikanlah data dalam bentuk tabel berdasarkan nama pemain dengan jumlah gol terbanyak yang dicetak lalu tentukan median dan modulusnya!

The Indonesian U-22 team picked up their second win at the 2023 SEA Games by defeating Myanmar with a landslide score. So far, the Indonesian U-22 national team is still the team with the highest goal productivity at the 2023 SEA Games. Interestingly, this special record is only supported by five players, Fajar Fathur Rahman, Ramadhan Sananta, Marselino Ferdinan, Irfan Jauhari, and Titan Agung. The last two names contributed one goal, Fajar scored four goals in three matches, Sananta scored three goals, and Marselino scored two goals. Based on the information above, present the data in a table based on the names of the players with the most goals scored and then determine the median and mode!

No.	Nama Pemain	Jumlah Gol
1.	Irfan Jauhari dan Titan Agung	1 + 1
2.	Fajar	4
3.	Sananta	3
4.	Marselino	2

- median
1 1 4 3 2
↓ ↓ ↓ ↓ ↓
1 1 ② 3 4
Median = 2
- Modus = 1

Figure 2. Problem and Student Answer on Problem Number 1

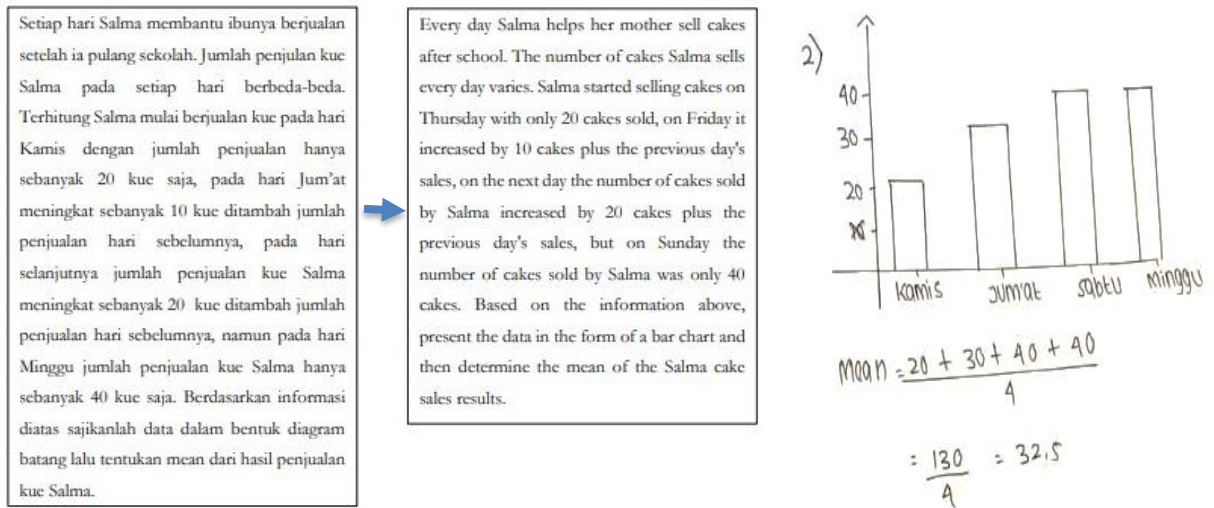


Figure 3. Problem and Student Answer on Problem Number 2

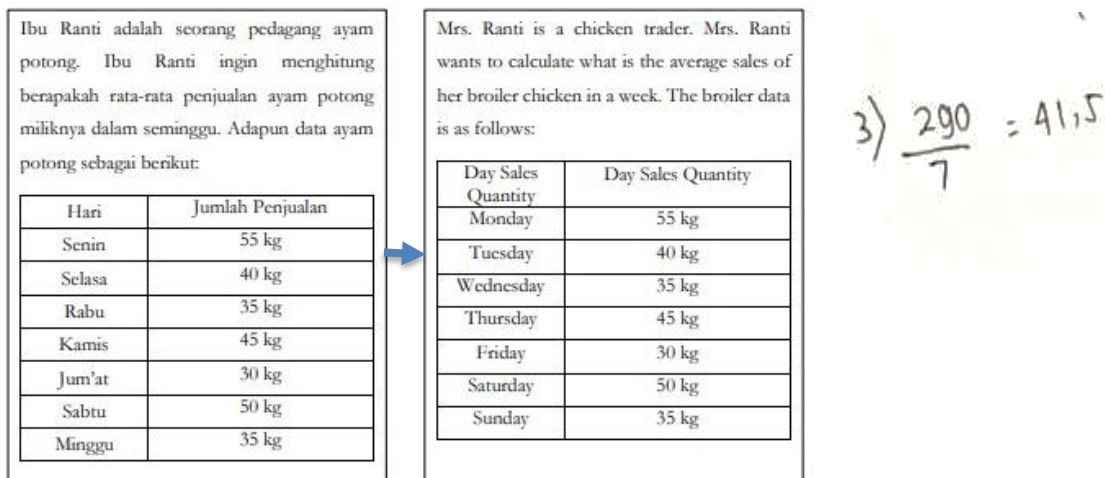


Figure 4. Problem and Student Answer on Problem Number 3

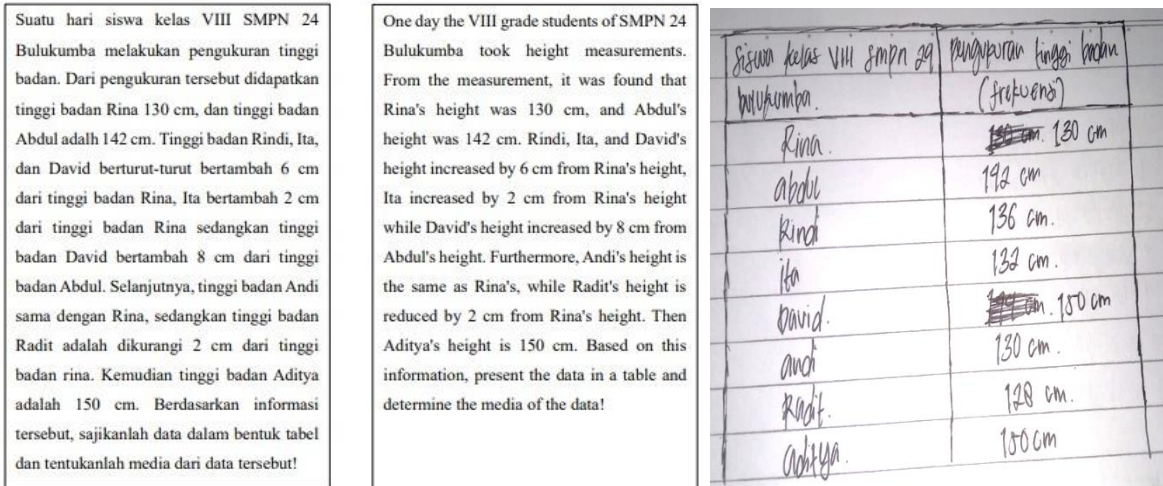


Figure 5. Problem and Student Answer on Problem Number 4

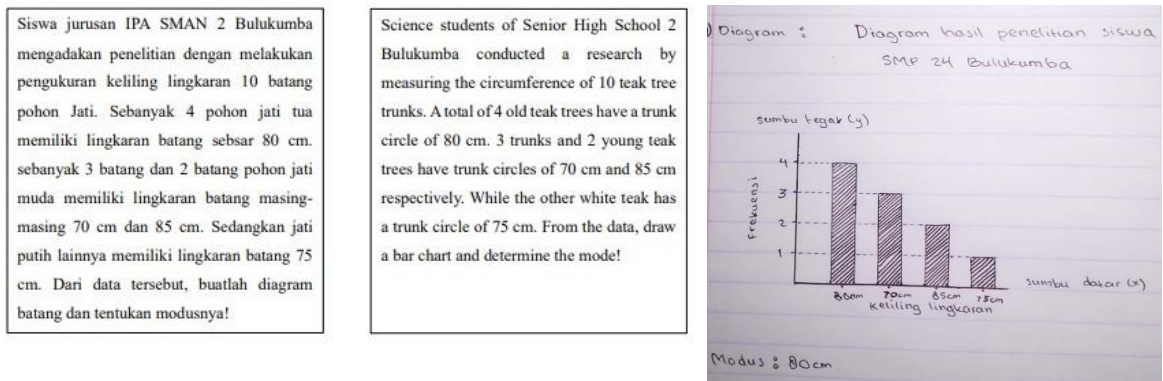


Figure 6. Problem and Student Answer on Problem Number 5

The answers given by students in question number 1 are still incorrect, students are mistaken in determining the mode value by looking at the number of players who scored 1 goal. While the correct mode is the goal scored by Fajar Fatur Rahman. In question number 2, the student's answer is less precise on the number of salma cakes on Saturday, as a result the median value obtained is also incorrect. In question number 3, the way to answer is correct, but the results obtained are not correct. This is due to students' mistakes in understanding the meaning of the problem, due to the lack of integration of mathematical literacy in the examples of problems given by the teacher. Then, in problem number 4, students' answers in presenting data in the form of a table are correct, it's just that students don't look for the median of the data presented. In problem number 5, students' answers are completely correct. Then, when the teacher has conveyed how to

solve the problem, students begin to be able and gain new knowledge. The institutionalization situation requires teachers to be professional and competent to convey concepts that are in accordance with the truth, where these concepts will support students' mathematical literacy competencies in data and uncertainty content in statistics material.

Learners essentially have a maximum competence that can develop independently without interacting with teachers or other learners called development (Vygotsky, 1978). So that the learning process should facilitate in the process of culture or facilitation. Furthermore, the development potential of learners develops with a discussion process between learners or with teachers so that the proximal area of development can be resolved.

According to Radford (2000) and Suryadi, Yulianti, and Funaci (2009), the teacher's role is only to create a situation for students in learning that supports student interaction. This leads to meaningful learning in the learning process (Ausubel, 1962), the importance of repetition before students learn the concept of word games makes learning more meaningful (Suherman et al., 2011). Other important principles for implementing a meaningful learning process for students in the learning process include:

- a. Open cooperation that allows all learners to learn.
- b. Motivation helps to make learners interested in learning
- c. Methods should be appropriate to the learners' environment
- d. Creativity that can strengthen learners' imagination and intelligence
- e. Concept mapping that helps to connect each part of the material being studied
- f. Education curriculum that should be in accordance with the conditions needed by the learners.

Based on the various situations that have been described, it can be concluded that the didactical situation in learning statistics has not gone well, especially those that can support students' mathematical literacy competencies in data and uncertainty content. Although on the other hand the teacher tries to make students understand by explaining repeatedly, from the results of the identification of students' answers to the questions given related to mathematical literacy on data and uncertainty content and the learning process carried out, but the integration of learning that can improve students' mathematical literacy competencies on data and uncertainty content and understand the concept of statistical material well and can solve contextual problems.

The results of interviews and giving mathematical literacy questions on data and uncertainty content, obtained information that students experience learning obstacles so

that they have difficulty working on problems. The following is an excerpt of the interview results from one of the students.

P : "Do you often not understand statistics material?"

S : "Yes, often"

P : "Why can't you understand it?"

S : " Because we can't understand the explanation from the teacher, but the teacher still tries to explain repeatedly, often kak if we don't understand"

P : "How about the problems given by your brother, did you have difficulty working on them?"

S : "Yes, it is difficult, because I also have difficulty answering questions when using division and I also have difficulty understanding the questions"

P : "Do you often experience obstacles when learning statistics material?"

S : "Often kak, usually it's more about not understanding the teacher's explanation, especially not understanding division is very difficult. If the problem that was done earlier was difficult to understand kak because usually the questions are also according to the example of the teacher so you can see how to work on it because it is only a difference in numbers, but if the question like that is more difficult because you have to read well the meaning of the question and have never practiced questions like that."

Learning obstacles are difficulties experienced by students in solving problems. mental readiness of students to learn, as well as a result of the teaching system (Suryadi, 2013). In knowing learning obstacles, students are given 5 essay questions in the form of mathematical literacy questions on data and uncertainty content. Based on the results of identifying learning obstacles through students' answers, information was obtained that:

- a. Learners have errors in translating the meaning of the problem so that when determining the mode, students are still mistaken in their determination.
- b. Learners mistakenly present data in tabular form.
- c. Learners are less careful in reading the problem, so the numbers in the problem are immediately written down, without knowing the meaning of the numbers in the problem.

- d. Learners still mistakenly present data in the form of a bar chart because they do not understand the meaning of the question well.
- e. Learners are still mistaken in determining the average (mean).

Based on the explanation above, the learning obstacles identified are epistemological obstacles and didactical obstacles. Epistemological obstacle is that students' knowledge is only limited to certain contexts, but when they are in other or different contexts, students cannot apply the knowledge they already have (Suryadi, 2019). Some students' answers in writing the mean, median, and mode formulas are correct. However, when looking at the completion of the problem, it is still wrong, because when the problem has been modified and linked to literacy so that the meaning of the problem must be identified first and students must be creative in choosing problem solving, students still have difficulty in solving the problems given. This means that, the knowledge that exists in students is still difficult to apply to similar problems but in a different form. In addition, there are also learning obstacles in the form of didactical obstacles. Didactical obstacles are learning obstacles that occur as a result of the teaching system implemented. This learning obstacle occurs because the presentation of learning materials pays less attention to things that are contextual to the lives of students and students are less actively involved in learning, so that the concepts that are then conveyed cannot be captured properly by students. At the beginning of learning, students are not invited to understand statistics contextually and find statistical concepts to build their own thoughts through stimulation from the teacher. This is important to do so that when students are faced with other similar problems but in a different form, students can solve the problem. In addition, integrating mathematical literacy in statistics learning is also still not applied by teachers, the problems or problems given do not involve the process of identification and reasoning and support to improve mathematical literacy. Therefore, when students work on mathematical literacy questions on data and uncertainty content, there are still many mistakes experienced by students, especially in identifying problems from the problem and analyzing the purpose of the problem and what is required in the problem.

Some of the factors that cause learning barriers are based on the researcher's findings:

- a. Didactical situations are not well implemented, namely action situations, formulation situations, validation situations, and institutional situations.
- b. At the beginning of learning, students are not invited to understand statistical material contextually so that students' statistical concepts are still weak.

- c. Lack of integration of questions based on mathematical literacy competencies in data and uncertainty content so that students have difficulty in solving the problems given.
- d. The learning that takes place does not pay attention to the didactical situation that should occur so that it causes the lack of development of students' knowledge when faced with problems that must be identified first before choosing a way to solve the problem.
- e. Learners' understanding is limited to what the teacher says. Learners do not discuss and construct their own knowledge to collide with the knowledge obtained from the teacher so that it will be difficult to develop.

Acknowledgment

Thanks to the Junior High School 2 Bontonompo Selatan school for accommodating the author so that this article was created. To the beloved Algebra_20 family who never stop being an alarm and support system in all conditions. And to the author himself for successfully completing this article. Finally, to Allah SWT who has given health and opportunity so that the author can complete this article.

REFERENCES

- Andani, M., Jamilah, & Hartono. (2021). Didactical Obstacle for Ninth Grade Students on Geometric Series Material. *Journal Of Innovation Research And Knowledge*, 1(5), 887-894.
- Arwildayanto, Sukung, A., & Sumer, W. T. (2018). *Education Policy Analysis*. CV Cendikia Pess.
- Brousseau, G. (2002). *Didactic Situation Theory in Mathematics*. Library of Mathematics Education: New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers.
- Faudiah, N. F. (2021). Theory Of Didactical Situation (TDS), Review of Characteristics and Application in Mathematics Learning. *Journal of Mathematics Education*, 4(2), 160-169. <https://doi.org/10.31539/judika.v4i2.3054>.
- Fauzi, R., Efendi, R., & Mustakim. (2020). Community-Based Hypertension Disease Management Program with a Family Approach in Pondok Jaya Village, South Tangerang. *Journal of Community Service*, 4(2), 69-74. <https://doi.org/10.30656/jpmwp.v4i2.1931>.
- Fuadiah, N. F. (2017). *Potential Effect of Didactical Design on Concept Mastery*.
- Huwaida, H. (2019). *Descriptive Statistics* (A. Pratono (Ed.)). Poliban Press.
- Jatisunda, M. G., & Nahdi, D. S. (2019). Students' Difficulties in Understanding

- Trigonometric Concepts Seen from Learning Obstacles. *Journal Didactical Mathematics*, 2(1), 9-16.
<http://download.garuda.kemdikbud.go.id/article.php?article=>.
- Lestari, A. D., Hartoyo, A., & Suratman, D. (2020). *Analysis of Students' Statistical Problem Solving Ability in Class VIII SMP Negeri 6 Pontianak*. 58, 1-8.
<http://dx.doi.org/10.26418/jppk.v9i9.42306>.
- Lutfi, M. K., Juandi, D., & Jupri, A. (2021). Students' Ontogenic Obstacle On The Topic Of Triangle And Quadrilateral Students' Ontogenic Obstacle On The Topic Of Triangle And Quadrilateral. *Journal Of Physics: Conference Series*, 1-7.
<https://doi.org/10.1088/1742-6596/1806/1/012108>
- Mekarisce, A. A. (2020). Data Validity Check Techniques In Qualitative Research In Public Health. *Scientific Journal of Public Health*, 12(33).
<https://doi.org/10.52022/jikm.v12i3.102>.
- Murdiyanto, E. (2020). *Qualitative Research Methods (Theory and Application Accompanied by Sample Proposals)* (L. P. And P. P. M. U. "Veteran" (Ed.)). Yogyakarta Press.
- OECD. (2019). *PISA 2018 Assessment and Analytical Framework*. OECD Publishing.
- Pristiwanti, D., Badariah, B., Hidayat, S., & Dewi, R. S. (2022). Definition of Education. *Journal of Education and Counseling*, 4(6), 7911-7915.
<https://doi.org/10.31004/jpdk.v4i6.9498>.
- Radford, L. (2000). *Theories In Mathematics Education: A Brief Inquiry Into Their Conceptual Differences*. ICMI 11 Survey Team 7: The Notion And Role Of Theory In Mathematics Education Research. Working Paper.
- Radford, L. (2008). *Theories In Mathematics Education: A Brief Inquiry Into Their Conceptual Differences*. ICMI 11 Survey Team 7: The Notion And Role Of Theory In Mathematics Education Research. Working Paper.
- Rijali, A. (2018). *Qualitative Data Analysis Ahmad Rijali UIN Antasari Banjarmasin*. 17(33), 81-95.
- Rohimah, S. M. (2017). Analysis of Learning Obstacles on the Material of Linear Equations and Inequalities of One Variable. *JJPM*, 10(1), 132-141.
<http://dx.doi.org/10.30870/jppm.v10i1.1293>.
- Roth, S. (2019). *The Open Theory And Its Enemy: Implicit Moralization As Epistemological Obstacle For General Systems Theory*. <https://doi.org/10.1002/Sres.2590>
- Ruli, R. M., Imami, A. I., & Abadi, A. P. (2022). Socialization of Didactic Design to Secondary School Teachers in Karawang Regency. *Indonesian Journal of Community Service*, 2(1), 51-55. <https://doi.org/10.1007/0-306-47211-2>.
- Saat, S., & Mania, S. (2020). *Introduction to Research Methodology: A Guide for Young Researchers* (Muzakki (Ed.)). Retrieved from Almailda.
- Sidiq, U., & Choiri, M. M. (2019). *Qualitative Research Methods in the Field of Education* (A. Mujahidim (Ed.)). CV. Nuta Karya.

- Sumita, E., Jamilah, & Muchatadi. (2022). Analysis of Idactic Situation Based on T Eory O F Idactic Situation (TDS) of Cube and Block Materials. *Indonesian Journal of Mathematics Education*, 7(2), 67-72. <https://dx.doi.org/10.26737/jpmi.v7i2.3414>.
- Suryadi, D. (2013). Didactical Design Research (DDR) in Mathematics Learning Development. *Proceedings of the National Seminar on Mathematics and Mathematics Education*, 1. https://www.academia.edu/download/55599800/SEMNAS-PMAT-2013_Jurnal_Didi_Suryadi_DDR.pdf#page=13.
- Suryadi, D. (2019). *Philosophical Foundations of Didactical Design Research (DDR)*. University of Education Indonesia.
- Sutopo, Y., & Slamet, A. (2017). *Inferential Statistics (Glovanny)*. CV.Andi Offset.
- Wildani, J., Triyana, I. W., & Mahmudah, W. (2019). Statistical Literacy of Class VIII Students of SMP Negeri 1 Gresik. *Vigotsky Journal*, 1(2), 99-110. <https://doi.org/10.30736/vj.v1i2.137>.
- Yuliana, R. E. (2017). Didactical Situation Design to Anticipate Students' Mathematics Anxiety in Learning Algebra Concepts in Junior High School. *Journal of Mathematics Education Research*, 2(1), 105-120. <https://doi.org/10.32502/jp2m.v1i2.1486>.
- Yusuf, M. (2021). *Holistic Education According to Experts*.