MATHEMATICAL LITERACY ABILITYOF STUDENTS IN DISCOVERY LEARNING VIEWED FROM THE EXISTENCE OF LEARNING MEDIA

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Abstract

The purpose of this study was to determine students' mathematical literacy abilities in discovery learning in terms of the existence of learning media. The method used in this research is a descriptive qualitative approach. This research was conducted at MAN Tegal, Tegal City with research subjects namely class XI IPA and sampling using cluster random sampling. Data collection techniques used observation, interviews, and tests. Data analysis techniques used, namely data reduction, data presentation and conclusion drawing and using data triangulation. The results showed that (1) students at the high category of mathematical literacy were able to complete all indicators and reach level 4. (2) students at the moderate level of mathematical literacy ability fulfilled 3 indicators and. reach level 3. (3) students at the low category level of mathematical literacy only meet 2 indicators of literacy ability and reach level 2.

Keywords: Literacy mathematical, discovery learning, and learning media.

1 INTRODUCTION

Education has a very important role in creating quality human resources. The role of education in Indonesia can be pursued through three channels, namely formal, non-formal and informal education (Umaroh, 2021). This is stated in Law number 20 of 2003 concerning the National Education System in which there are educational pathways in Indonesia. Each existing educational path has a curriculum that is used as a guideline so that education can be carried out properly. Mathematics is one of the subjects obtained from elementary school to university level. Mathematics is a subject that has an important role in education because it can equip students to think logically, analytically, critically, and creatively (Herdin, 2019). Mathematics is very closely related to mathematical literacy. Literacy is more than the ability to read and write, communicate and use language. Literacy is the ability to communicate or more precisely, to participate in language-related activities. One of the students' abilities in learning mathematics which is still relatively low is the ability of mathematical literacy. Affairs. This can be seen from the results of the 2018 PISA survey, the country of Indonesia is still below the score acquisition, for the competency score of reading literacy Indonesia is ranked 72 out of 77 countries, for the score of mathematical literacy is ranked 72 out of 78 countries, while the score of scientific literacy is ranked 70 out of 78 countries (Rodhi, 2021). Based on the survey results, it shows that students' reading literacy skills are still low. Then the ability is needed to foster students' interest in reading.

Mathematical literacy ability is an individual's ability to formulate, apply, and interpret mathematics in various contexts that involve reasoning and the use of mathematical concepts, procedures, facts and functions to describe, explain, and relate and predict a phenomenon with everyday life (OECD, 2016).

According to Fadholi (2015), the attainment of a low level of mathematical literacy is because students have never done mathematical literacy questions. Thus, efforts are needed to improve literacy skills so that students' learning outcomes in learning mathematics increase.

Students' difficulties in mathematical literacy skills are caused by students who feel they have not been able to solve problems related to everyday life. A student is said to be able to solve problems if he is able to apply previously acquired knowledge to new, unfamiliar situations (Astuti, 2018). Mathematical literacy is said to be good if it is able to analyze, reason, and communicate mathematical knowledge and skills effectively.

Meanwhile the results of observations and interviews in class XI at MAN Tegal with one of the mathematics teachers which were held on January 4 2023 showed that students' mathematical literacy skills were still low, namely 65. This was indicated by the average score in mathematics subjects obtained by students class XI IPA 1 and XI IPA 2, namely 60-70 and still below the KKM score, which is 70.

In learning, the teacher's role is not only as a teacher, but also as a facilitator, while students act as individuals who are learning. One of these efforts can be made by teachers to develop mathematics learning through students' mathematical literacy skills, among others by designing student-centered learning activities so that literacy skills increase. One thing that can be done to improve students' mathematical literacy skills is the use of appropriate learning media and learning models. One of the learning models that can improve mathematical literacy skills is the discovery learning model.

Discovery learning is a discovery learning model that is in accordance with the implementation of the 2013 curriculum. Discovery is a learning model developed based on a constructivism view (Fitriyah, et al, 2017). In order for the discovery learning learning model to run well, learning media is needed that is able to clarify the material. Learning media also needs to be used to convey abstract concepts in mathematics lessons (Lintang, et al, 2017). With the media, learning can take place effectively and is able to make students active, work together, and express opinions. This is in line with the results of a study from Agustyaningrum (2013) in learning mathematics which requires a learning that allows students to be active, more free to express opinions, help each other, and work together with peers in solving problems to gain new knowledge. The purpose of this study was to determine students' mathematical literacy abilities in discovery learning in terms of the existence of learning media in schools.

2 METHODOLOGY

This research method is included in the descriptive qualitative research. This research was carried out at MAN Tegal in the 2022/2023 academic year, even semester. The data sources used in this study are primary data sources and secondary data. The primary data source in this study is data on the results of tests of mathematical literacy skills using learning media in schools and the subject of this research is class XI IPA MAN Tegal with sampling using cluster random sampling technique. Secondary data sources in this study were in the form of library books, scientific journals, theses and MAN Tegal documents needed to achieve research objectives.

Data collection techniques used are observation, interviews, tests and documentation. Observations in this study were to observe students' mathematical literacy abilities. The interviews in this study used a structured interview technique which was carried out with subjects who had high, medium and low mathematical literacy categories. The test used is in the form of descriptive questions to determine subjects in the high, medium and low categories. The documentation used in this study is data to support students' mathematical literacy skills in terms of the existence of learning media in schools.

The data analysis technique used is an interactive model of qualitative data analysis which includes data reduction, data presentation, and drawing conclusions while the data presentation technique uses data triangulation.

In the methods section, you need to explain how the research was carried out. This is intended to (1) enable readers to evaluate your research, and (2) provide guidance for readers to be able to repeat research studies that you have conducted in the future. You must explain exactly your research method, such as: what the method is, how many populations and samples or subjects, where the research was conducted, when the research was conducted (how long), and the equipment and supporting materials used in the research. This is necessary to ensure that detailed information is available for readers to verify your research findings and open up space for further studies. You do not have to explain technically or step by step, but you are asked to maintain the density, completeness and adequacy of the information you provide.

3 RESULTS

The results of students' mathematical literacy abilities found that there were students who had high mathematical literacy abilities of 13 students, students who had moderate mathematical literacy abilities

of 45 students, students who had low mathematical literacy abilities of 12 students. The following presents the results of mathematical literacy skills in table 1.

Table 1. *Results of Mathematical Literacy Ability*

Data	Nilai
Rata-rata	66,8
Standar Deviasi	13,75
$\tilde{x} + SD$	80,55
$\tilde{x} - SD$	53,04

Based on Table 1. it shows that the result of students' mathematical literacy ability is 66.8 and the standard deviation is 13.75. The average score obtained was obtained from 70 students in class XI IPA 1 and 2. From the results of the mathematical literacy ability test for each category, two subjects who had high mathematical literacy skills with the highest scores were taken, two subjects who had moderate mathematical literacy abilities with scores the highest and two subjects who have literacy skills. The following lists the names of research subjects in table 2.

Table 2. *List of Names of Research Subjects*

Nama Subjek	Kode Subjek	Nilai	Kategori
Muh. Hasan	T1	83	Tinggi
Nova Syafa	T2	80	Tinggi
Elsa Yogi P.	S1	70	Sedang
Nanda Nurul	S2	67	Sedang
M.Ramadhan	R1	50	Rendah
Daffa Maulana	R2	35	Rendah

Based on Table 2. the research subjects who had carried out a mathematical literacy ability test which contained 6 essay test questions with the level criteria for each question, namely question number 1 was a level 1 question, question number 2 was a level 2 question, question number 3 was a level level question 3, question number 4 is a level 4 question, question number 5 is a level 4 question, question number 6 is a level 4 question. The determined research subjects will then be analyzed for mathematical literacy skills. The following presents indicators of material literacy ability in table 3.

Table 3. *Mathematical Literacy Ability Code*

No.	Indikator	Kode
1	Solve routine questions and can solve problems in a general context	IDK 1
2	Interpret problems and solve with formulas	IDK 2
3	Carry out procedures well in solving problems and be able to choose problem solving strategies	IDK 3
4	Integrate different representations	IDK 4

Based on table 3. indicators of solving routine questions and being able to solve problems in a general context can be written with IDK 1, indicators of interpreting problems and solving with formulas can be written with IDK 2, indicators of carrying out procedures well in solving problems and being able

to choose problem solving strategies are written with IDK 3, and indicators integrating different representations can be written with IDK 4.

3.1 Analysis of Mathematical Literacy The Results

3.1.1 Analysis of the results of mathematical literacy in high subjects

From the results of the analysis of the mathematical literacy test given, it shows that the tall subject on test questions number 1, number 2, number 3, number 4, number 5, and number 6 is able to fulfill all indicators of mathematical literacy ability. From the results of the interview analysis on test questions number 1, number 2, number 3, number 4, number 5, and number 6 the high subject was able to fulfill all indicators. From the results of the analysis of tests and interviews, it can be drawn that the percentage of mathematical literacy skills is in the high category. The following shows a picture of the percentage of mathematical literacy skills with high categories in Figure 1.

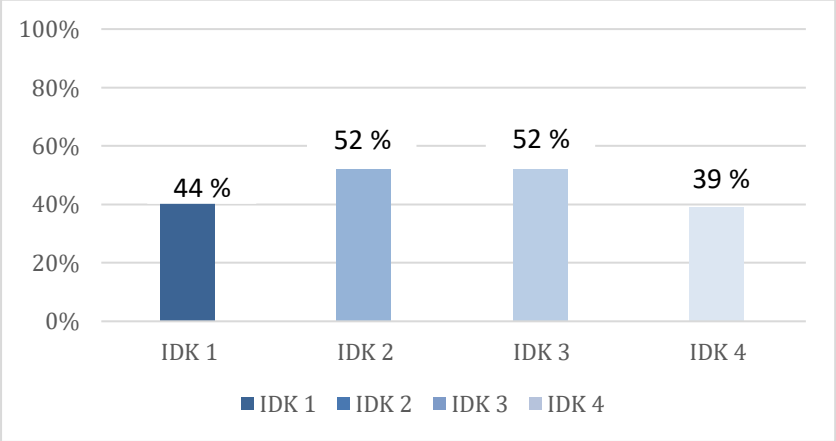

Figure 1. *Percentage of Mathematical Literacy Ability Indicators High Subject*

Based on Figure 1. it can be seen that the percentage of literacy ability levels in IDK 1 resulted in an achievement of 44%. IDK 2 produces an achievement of 52%. IDK 3 produces an achievement of 52%. IDK 4 produces an achievement of 39%. So that in this study the literacy ability according to PISA achievement indicators was greater than research from Wati, Sugiyanti, and Muhtarom (2019).

3.1.2 Analysis of the results of moderate subject mathematics literacy

From the results of the analysis of the mathematical literacy test given, it shows that the subject being on test questions number 1 and number 2 is able to fulfill the three indicators of mathematical literacy ability. In test questions number 3, number 4 and number 6 were able to fulfill all indicators of mathematical literacy ability. In test question number 5 it is able to fulfill three indicators. From the results of the interview analysis on test questions number 1, number 2, number 3, number 4, number 5, and number 6 the subject is being able to fulfill all indicators. From the results of the analysis of tests and interviews, it can be drawn that the percentage of mathematical literacy skills is in the medium category. The following shows a picture of the percentage of mathematical literacy skills with high categories in Figure 2.

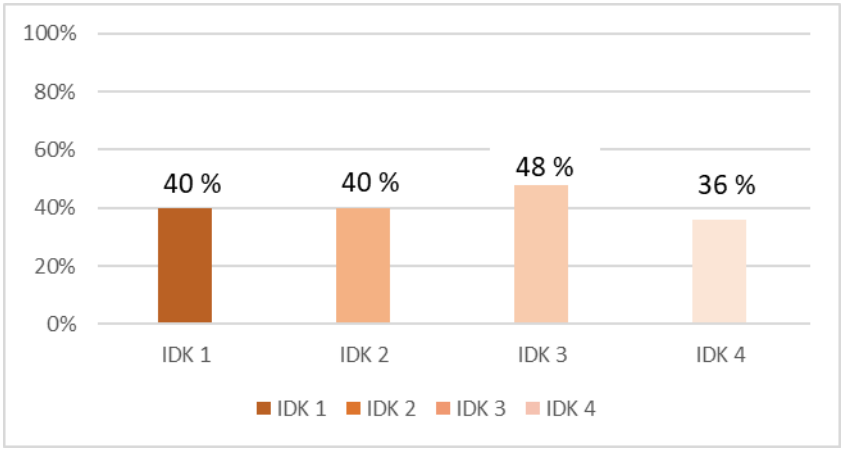

Figure 2. *Percentage of Mathematical Literacy Ability Indicators Moderate Subject*

Based on Figure 2, it can be seen that the percentage results for each indicator of mathematical literacy ability, namely IDK 1, produce an achievement of 40%. IDK 2 produces an achievement of 40%. IDK 3 produces an achievement of 48%. Meanwhile, IDK 4 produced an achievement of 36%. So that in this study the literacy ability according to PISA achievement indicators was greater than research from Wati, Sugiyanti, and Muhtarom (2019).

3.1.3 Analysis of the results of low subject mathematical literacy

From the results of the analysis of the mathematical literacy test given, it shows that low subjects on test item number 1 are able to fulfill IDK 1, IDK 2 and IDK 3. On test item number 2 they are able to fulfill IDK 1, IDK 2, and IDK 3. On test item number 3 able to meet all indicators. In test question number 4 it is able to fulfill all indicators. In test question number 5 is able to fulfill all indicators. In test question number 6 is able to meet all indicators.

Based on the analysis of interview excerpts on questions number 1, number 2, number 3, number 4, number 5, and number 6, low subjects were able to integrate different representations in each question according to the information available. From the results of the analysis of tests and interviews, it can be drawn that the percentage of mathematical literacy skills is in the low category. The following shows a picture of the percentage of mathematical literacy skills with high categories in Figure 3.

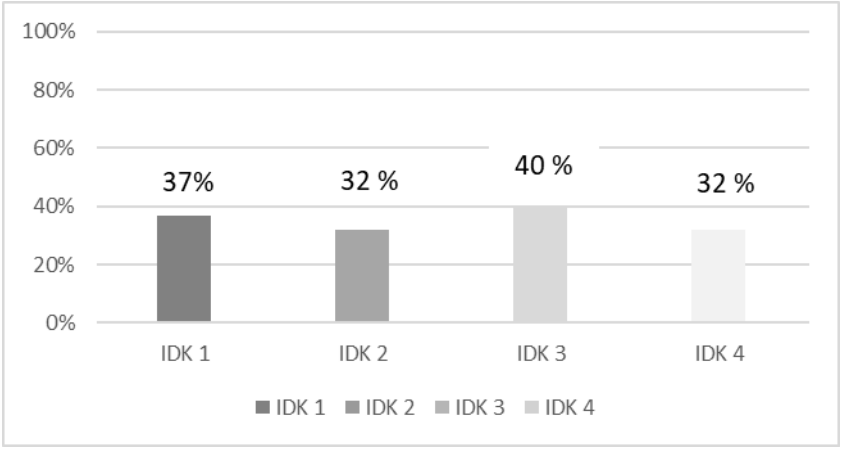

Figure 3. *Percentage of Mathematical Literacy Ability Indicators Low Subject*

Based on Figure 3. it can be seen the results of the percentage of mathematical literacy skills, namely IDK 1 produces an achievement of 37%. IDK 2 produces an achievement of 32%. IDK 3 produces an achievement of 40%. Meanwhile, IDK 4 produced an achievement of 32%. So that in this study the literacy ability according to PISA achievement indicators was greater than research from Wati, Sugiyanti, and Muhtarom (2019).

3.1.4 Discussion

The results of this study in the form of students' mathematical literacy abilities are described as follows.

1) High Mathematical Literacy Ability

The research subjects for high mathematical literacy skills, students who have high levels of literacy ability can solve questions number 1, 2, 3, 4, 5, 6 well. This shows that subjects with high mathematical literacy skills can work on questions up to level 4 according to the level of literacy according to PISA.

2) Moderate Mathematical Literacy Ability

The research subjects for moderate mathematical literacy skills, students who have moderate literacy ability levels can solve questions number 3, 4, 5, and 6 well. This shows that subjects with high mathematical literacy skills can work on questions up to level 3 according to the level of literacy according to PISA.

3) Low Mathematical Literacy Ability

The research subjects for low mathematical literacy skills were subject R1 and subject R2. Students who have a low level of literacy ability can solve questions number 4, 5, and 6 well. This shows that subjects with high mathematical literacy skills can work on questions up to level 2 according to the level of literacy according to PISA.

4 CONCLUSIONS

Based on the results of data analysis and discussion of the mathematical literacy abilities of students in class XI IPA I and IPA II for the 2022/2023 academic year, it can be concluded that students with high, medium, and low mathematical literacy abilities have differences from each indicator of mathematical literacy according to PISA namely solving routine questions and being able to solve problems with a general context, interpreting problems and solving them with formulas, carrying out procedures well in solving problems and being able to choose problem-solving strategies, integrate different representations.

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