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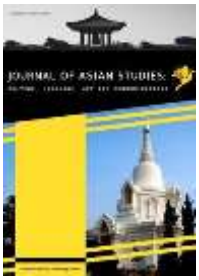

LEARNING OBSTACLES TO MATHEMATICAL LITERACY SKILLS OF STATISTICAL MATERIAL IN CLASS X

HAMBATAN BELAJAR PADA KEMAMPUAN LITERASI MATEMATIS MATERI STATISTIKA DI KELAS X

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Abstract
This research is motivated by the low mathematical literacy skills of students. The low mathematical literacy skills of students is due to learning obstacles that occur in students. Therefore, the purpose of this study is to describe the types of learning learning obstacles to students' mathematical literacy abilities in the statistics material of class X.E.2 SMA Negeri 3 Padang. The subject of this study was a class X.E.2 student of SMA Negeri 3 Padang. The research method used is a descriptive research method with a qualitative approach. The instruments used in this study were interviews and tests. The data analysis technique in this study is by analyzing test results and interview results. Based on research that has been carried out, it shows that the mathematical literacy ability of class X.E.2 SMA Negeri 3 Padang reaches level 4. The learning barriers found in students based on mathematical literacy skills are ontogeny obstacles that occur in students with mathematical literacy skills level 1 to level 4, generally students do not understand the prerequisite material. In didactic barriers, students with mathematical literacy skills level 1 to level 4 generally experience obstacles, namely the material taught by the teacher is incomplete. Epistemological obstacles found in students with mathematical literacy skills level 1 to level 4 generally experience obstacles, namely students' understanding of the concept of incomplete material.
Keywords: *learning obstacles, mathematical literacy, statistical material*

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Abstrak
Penelitian ini dilatarbelakangi oleh masih rendahnya kemampuan literasi matematis siswa. Rendahnya kemampuan literasi matematis siswa karena adanya hambatan belajar yang terjadi pada siswa. Oleh karena itu tujuan penelitian ini adalah untuk mendeskripsikan jenis hambatan belajar pada kemampuan literasi matematis siswa dalam materi statistika kelas X.E.2 SMA Negeri 3 Padang. Subjek penelitian ini adalah siswa kelas X.E.2 SMA Negeri 3 Padang. Metode penelitian yang digunakan adalah metode penelitian deskriptif dengan pendekatan kualitatif. Instrumen yang digunakan pada penelitian ini yaitu wawancara dan tes. Teknik analisis data pada penelitian ini yaitu dengan cara menganalisis hasil tes dan hasil wawancara. Berdasarkan penelitian yang telah dilakukan menunjukan bahwa kemampuan literasi matematis kelas X.E.2 SMA Negeri 3 Padang mencapai level 4. Adapun hambatan belajar yang ditemukan pada siswa berdasarkan kemampuan literasi matematis yaitu hambatan ontogeni yang terjadi pada siswa dengan kemampuan literasi matematis level 1 sampai dengan level 4 umumnya siswa tidak memahami materi prasyarat. Pada hambatan didaktik siswa dengan kemampuan literasi matematis level 1 sampai dengan level 4 umumnya siswa mengalami hambatan yaitu materi yang diajarkan guru kurang lengkap. Hambatan epistemologi yang ditemukan pada siswa dengan kemampuan literasi matematis level 1 sampai dengan level 4 umumnya mengalami hambatan yaitu pemahaman konsep siswa terhadap materi kurang lengkap..
Kata kunci: *hambatan belajar, literasi matematis, materi statistika*

1. INTRODUCTION

Mathematics is a science that is structured, characteristic, organized, and continuous in the learning process, so that it becomes an important lesson taught at all levels of education (Faizin, 2019). Mathematics acts as a means of scientific thinking that is useful for developing logical, systematic, and critical thinking skills in students (Titat & Yuliawati, 2017). Another role of mathematics in life is to support the development of science and technology (Berliana, 2021). Thus mathematics is a very important science for students both now and in the future because of an organized, characteristic, and sustainable learning system to support the development of Science and Technology (IPTEK).

Mathematics is not spared from the problems that must be solved, in the process of solving problems, mathematical literacy skills are needed that students must master (Kenedi, 2018). Mathematical literacy requires students to communicate and explain phenomena based on conditions according to mathematical concepts (Habibi, 2021). Mathematical literacy according to the Organisation for Economic Cooperation and Development (OECD) in 2019 is as the ability of reasoning, using mathematical concepts, procedures, tools and facts, to explain, describe or describe, and predict a phenomenon in (Edriati & Mardiyah, 2019). So mathematical literacy ability is an ability that connects all mathematical studies to everyday life with the appropriate systematic, starting from adjusting methods or concepts, analyzing, and being able to provide the final conclusion of a mathematical problem.

Speaking of mathematical literacy skills, Indonesia is one of the countries with low mathematical literacy skills or has not been able to give birth to a literate generation (Muzaki, 2019). This is evidenced in (Poernomo et al., 2021) the results of Indonesia's achievements in the Program for International Student Assessment (PISA) that mathematical literacy skills are still far below and lagging behind by developed countries from 2000 to 2018. It is appropriate in (Jufri, 2015) that PISA has 6 levels or 6 levels in the mathematical literacy category, levels 1 and 2 are categorized as low, 3 and 4 are categorized as medium, and 5 and 6 are categorized high according to level or level. In this case, based on data, Indonesia is still in the low category,

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namely at levels 1 and 2 in mathematical literacy skills so it really needs to be considered and addressed. In line with the PISA survey, Indonesia in the Trends in International Mathematics and Science Study (TIMSS) survey is still relatively unsatisfactory (Kenedi, 2018).

Decree of the Minister of Education, Culture, Research, and Technology No.162/M/2021 implements an independent learning curriculum with a driving school program with one of the visions, namely the development of holistic learning outcomes (Kemendikbud RI, 2021). In the National Examination (UN) driving program, it was abolished and replaced by the National Assessment (AN), namely the Minimum Competency Assessment (AKM), Character Survey, and Learning Environment Survey (Widianti & Hidayati, 2021). One of the national assessments is AKM. AKM is an assessment of the fundamental competencies needed by all students in order to develop their own abilities and play an active role in society in activities of positive value (Kemendikbud RI, 2020).

The AKM program created by the Ministry of Education and Culture is carried out already referring to PISA 2015 (Andikayana et al., 2021). The main components of AKM are divided into language literacy and numeracy (Kemendikbud RI, 2020). In the numeracy component, there are several contents, one of which is data and uncertainty. Content about the data itself will be discussed in the statistics material.

Statistics is a material that must be studied and understood by students because it acts as a means of analysis and interception, so that a conclusion is obtained (Titat & Yuliawati, 2017). Statistics are also useful materials in everyday life (Titat & Yuliawati, 2017). Thus there is a relationship between mathematical literacy and solving problems of AKM problems in statistical materials. In mathematical literacy skills in statistical material, sometimes there will be learning obstacles. Learning obstacles are student obstacles faced by students during learning and result in not optimal student learning processes and outcomes (Muthmainah et al., 2021). According to Brosseau (Cesaria & Herman, 2019) learning barriers are divided into three factors, namely mental readiness to learn (obstacle of ontogenic origin), education and teacher teaching system (obstacle of didactical origin), and limited student knowledge (obstacle of epistemological origin). In this case, as a teacher, you must be able to understand the types of obstacles in students in learning mathematics.

The reality in the field is that many phenomena are encountered and have led to the occurrence of a learning obstacle such as in the learning process, it is also found that students still find it difficult to understand and solve problems when practice is given by the teacher. During the daily test, students seem to have difficulty answering the daily test questions because students still do not understand the meaning of the questions, this can be seen when students often ask the teacher what the meaning of the questions is.

When the material is tested, there is a kind of obstacle that occurs in students so that there are complaints to students about the questions given by the teacher, so that students cannot complete the stages in solving a mathematical problem given and the students' answers are not as appropriate as those asked. Students also find it difficult to understand the problem if the problem is in the form of a story question, especially now that the school applies questions based on AKM. According to students, in understanding questions in the form of story questions, there are often mistakes in the process of solving problems given by the teacher. Students also mentioned that there are some examples of easy questions during the learning process, but when the assignment questions or daily tests students often forget the concepts and think the questions are not appropriate like the example given by the previous teacher. Based on the description

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above, research was carried out on learning obstacles in the mathematical literacy ability of students of statistical material in class X.

2. METHOD

This research was conducted at SMA N 3 Padang. This research uses a descriptive research method qualitative approach. The subjects of this study were class X.E.2 students totaling 35 students. The instruments of this study are tests and interviews. This research procedure consists of the initial stage, the implementation stage, and the final stage. The data collection technique of this study uses test and interview methods. The data analysis technique of this study is the technique of analyzing tests and interviews. Data analysis techniques to describe the level of mathematical literacy skills and learning obstacles. Meanwhile, interview analysis techniques according to Miles and Hubermen are data collection, data reduction, data display, and verification or drawing conclusions. Furthermore, test the validity of the data using triangulation of two instruments.

3. RESULTS AND DISCUSSION

Data for research and discussion results were obtained from student mathematical literacy tests and student interview results. The test is selected from AKM questions with statistical material. The test was conducted for 60 minutes on 35 students of class X.E.2 SMA Negeri 3 Padang. The data from the interview results were obtained from the interviews of teachers and students. The interview is conducted after analyzing the results of the student's already conducted test. The level of mathematical literacy of students is seen from the test results that have been given to 35 students. The level of mathematical literacy of students can be known from the achievement of indicators of students' mathematical literacy skills proposed by Sutrisno & Adirakasiwi (2019). The level of mathematical literacy found in students can be seen in Table 1 as follows:

Tabel 1. Results of Students' Mathematical Literacy Skills Levels

Mathematical Literacy Levels	Number of Students
Level 1	5
Level 2	14
Level 3	13
Level 4	3
Sum	35

Based on table 1 above, the level of student literacy skills was obtained, namely 3 students with level 4 mathematical literacy skills, 13 students with level 3 mathematical literacy skills, 14 students with level 2 mathematical literacy skills, and 5 students with level 1 mathematical literacy skills. Thus 3 representative students were selected from each level of mathematical literacy skills and described the types of obstacles that occur in these students. This is done because of the many similarities in the forms of learning obstacles found in students with the same level of mathematical literacy skills.

The description of learning obstacles is seen from the results of students' mathematical literacy tests and accompanied by interviews of students and teachers. Learning obstacles were analyzed from 35 students. The learning obstacles found in the results of the mathematical literacy test are as follows:

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Tabel 2. Description of Learning Obstacles in Statistics Test Number 1

Mathematical Literacy Skill Levels	Learning Obstacles		
	Ontogeny Obstacles	Didactic Obstacles	Epistemology Obstacles
Level 4	66%	0%	100%
Level 3	3%	0%	100%
Level 2	36%	0%	93%
Level 1	60%	0%	100%

Based on table 2, learning obstacles were obtained at each level of students' mathematical literacy skills, namely in students with level 4 literacy ability skills, 66% of students experienced ontogeny barriers, 0% of students experienced didactic barriers, and 100% of students experienced epistemological obstacles. In students with level 3 mathematical literacy skills, 3% of students experience ontogeny obstacles, 0% of students experience didactic obstacles, and 100% of students experience epistemological barriers. In students with level 2 mathematical literacy skills, 36% of students experience ontogeny obstacles, 0% of students experience didactic obstacles, and 93% of students experience epistemological obstacles. Finally, in students with level 1 mathematical literacy skills, 60% of students experience ontogeny obstacles, 0% of students experience didactic obstacles, and 100% of students experience epistemological obstacles.

Tabel 3. Description of Learning Obstacles in Statistics Test Number 2

Mathematical Literacy Skill Levels	Learning Obstacles		
	Ontogeny Obstacles	Didactic Obstacles	Epistemology Obstacles
Level 4	0%	0%	0%
Level 3	23%	0%	77%
Level 2	93%	0%	100%
Level 1	100%	0%	100%

Based on table 3, learning obstacles were obtained at each level of students' mathematical literacy skills, namely in students with level 4 literacy skills, 0% of students experienced ontogeny obstacles, 0% of students experienced didactic obstacles, and 0% of students experienced epistemological obstacles. In students with level 3 mathematical literacy skills, 23% of students experience ontogeny obstacles, 0% of students experience didactic obstacles, and 77% of students experience epistemological obstacles. In students with level 2 mathematical literacy skills, 93% of students experience ontogeny obstacles, 0% of students experience didactic obstacles, and 100% of students experience epistemological obstacles. Finally, in students with level 1 mathematical literacy skills, 100% of students experience ontogeny obstacles, 0% of students experience didactic obstacles, and 100% of students experience epistemological obstacles.

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Tabel 4. Description of Learning Obstacles in Statistics Test Number 3

Mathematical Literacy Skill Levels s	Learning Obstacles		
	Ontogeny Obstacles	Didactic Obstacles	Epistemology Obstacles
Level 4	0%	100%	100%
Level 3	23%	100%	100%
Level 2	43%	100%	100%
Level 1	80%	100%	100%

Based on table 4, learning obstacles were obtained at each level of students' mathematical literacy skills, namely in students with level 4 literacy skills, 0% of students experienced ontogeny obstacles, 100% of students experienced didactic obstacles and 100% of students experienced epistemological obstacles. In students with level 3 mathematical literacy skills, 23% of students experience ontogeny obstacles, 100% of students experience didactic obstacles and 100% of students experience epistemological obstacles. In students with level 2 mathematical literacy skills, 43% of students experience ontogeny obstacles, 100% of students experience didactic obstacles, and 100% of students experience epistemological obstacles. Finally, in students with level 1 mathematical literacy skills, 80% of students experience ontogeny obstacles, 100% of students experience didactic obstacles, and 100% of students experience epistemological obstacles.

Based on the previous description, a discussion of learning barriers found in students based on the types of obstacles according to Broesseau were ontogeny obstacles, didactic obstacles, and epistemological obstacles. The type of obstacle is seen from the representatives of 3 students at each level of mathematical literacy ability. The ontogeny obstacles found in students with MSB level 4 literacy skills is that students do not understand the prerequisites. In students with mathematical literacy skills level 3 DZM the obstacle of ontogeny found is that students do not understand the basic material. In students with level 2 RFA mathematical literacy skills, the ontogeny obstacles found are that students do not understand the basic material and prerequisite material and students forget the material that has been taught by the teacher. In students with level 1 mathematical literacy skills HMS ontogeny obstacles were found that students did not understand the prerequisite material and students forgot the material that had been studied.

The didactic barriers found in students with level 4 NOF mathematical literacy skills the material taught by the teacher is incomplete. In students with level 3 mathematical literacy skills, the didactic obstacles found are that the material taught by the teacher is incomplete. In students with level 3 INV mathematical literacy skills, students also experience learning obstacles, namely the material taught by the teacher is not complete. In students with mathematical literacy skills level 2 MHS didactic obstacles were found, namely the material taught by the teacher was incomplete. In students with level 1 GPW mathematical literacy skills the didactic obstacles found are that the material taught by the teacher is incomplete. Generally, didactic barriers found in students with mathematical literacy skills level 1 to level 4 experience learning obstacles s with the same case.

The epistemological obstacles found in ASF level 4 students are limited understanding of concepts and incomplete understanding of the material. In students with level 3 KIS mathematical literacy skills, the epistemological obstacles found are limited understanding of

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concepts, incomplete understanding of the material, and errors in mathematical operations and formulas. In students with level 2 BML mathematical literacy skills, the epistemological obstacles found are limited understanding of concepts and incomplete understanding of the material. In students with level 1 MNP mathematical literacy skills, the epistemological barriers found are incomplete understanding of concepts, limited understanding of the material, incomplete problem solving strategies.

4. CONCLUSION

Based on research that has been carried out, it shows that students in class X.E.2 SMA Negeri 3 Padang only reach level 4 in mathematical literacy skills. The learning obstacles in students with mathematical literacy skills level 1 to level 4, generally students do not understand the prerequisite material. In didactic barriers, students with mathematical literacy skills level 1 to level 4 generally experience obstacles to the material taught by the teacher is incomplete. Epistemological barriers found in students with mathematical literacy skills level 1 to level 4 are generally students' understanding of the concept of the material is incomplete.

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