COMPLETENESS OF DISCOVERY LEARNING LEARNING MODEL ON STUDENTS' MATHEMATICAL LITERACY

Izzaura Aden Abidin[1*], Shaefur Rokhman[2] , Paridjo[3]

[123]*Department of Mathematics Education, Pancasakti Tegal University, Tegal, Indonesia*

[*]*Correspondence author: adenabidin02 @gmail.com*

Abstract

This study aims to determine the completeness of the *Discovery Learning* learning model on Mathematical Literacy in Students. The population in this study is all grade X students of SMA Negeri 3 Brebes for the 2022/2023 academic year with a total of 365 didk participants. Sampling using *cluster random sampling* technique. The data collection methods used are interviews, tests, documentation. Previously instruments were tested for validity, reliability, difficulty, and differentiating power. The data analysis technique uses the proportion test of one right party, the t test of one right party, with normality and homogeneity tested first. The results of this study showed that the value of students taught using the *discovery Learning* learning model 60 % reached KKM 70. This can be seen from the number of students as many as 36 students who get scores above KKM, which is 23 students.

Keywords: Completeness, Discovery Learning Learning Model, Mathematical Literacy ability.

1   INTRODUCTION

In today's era, mathematical literacy is very important for every student. Increasing mathematical literacy is the main focus in mathematics learning. Things like this are mentioned in the 2013 curriculum. Mathematics is a compulsory subject for students, mathematical literacy is important to improve their learning activities. It is an activity that involves numbers, counts, and so on that is considered an application of mathematical knowledge involving everyday experience. Mathematics is the study of forms, magnitudes, and concepts related to each other. The relationship is not only in mathematics itself, but mathematics is also related to other disciplines, one of which is culture. This hints that mathematical literacy is becoming important.

Literacy comes from the word "*literacy*" which comes from the Latin "*littera"* (letter) whose understanding involves mastery of writing systems and accompanying conventions. However, literacy is primarily related to language and how it is used. Mathematical literacy ability is defined as a person's ability to formulate, apply and interpret mathematics in various contexts of everyday life [1]. In everyday life, students are faced with various problems, such as social, social, personal, scientific, and work. Many of these problems are related to the application of mathematics. With a good understanding of mathematics and using facts, concepts, reasoning and mathematical tools in solving everyday problems, it can help students in solving these problems. Mathematical literacy is an ability that should be possessed by a person in order to be able and able to face problems in everyday life. This is because someone will be given problems according to their abilities.

This ability helps one to recognize that mathematics plays a role in every aspect of life and to make reasoned decisions that are also needed constructively, engaged and reflectively. This means that mathematical literacy can help individuals to recognize the role of mathematics in the real world and as a basis for consideration and decision making needed by society. Teachers as educators for students are required to be able to create a pleasant learning atmosphere and make it easier for students to facilitate learning [2]. In learning, teachers are required to design a learning activity that is able to provide the widest possible opportunity for students to express their mathematical ideas, develop their thinking skills, and be given the opportunity to develop problems given by the teacher.

Based on the results of an interview conducted on January 3, 2023 with a mathematics teacher, Mr. Muh. Toha M.Pd and Mr. Bambang Setiawan S.Pd obtained information that there are various factors that cause low literacy ability of students, such as the assumption of students who find it difficult to learn mathematics, causing students' interest in mathematics to decrease, the learning process that

is too monotonous, and the weak memory of students. The learning process that has been applied when he teaches is by using lectures, questions and answers and occasionally in groups. Researchers also had time to interview a number of class X students during the implementation of School Field Practice in December 2022. A number of students on average answered that the teacher's way of delivering the material was still difficult to understand, so that students found it difficult to understand the concept of the material presented and as a result students had difficulty solving the questions given even though they had previously been given examples first by the teacher.

In the learning process, there is a close relationship between teachers, students, curriculum, facilities and infrastructure. Teachers have the task to choose the right learning model in accordance with the material delivered in order to achieve educational goals. Teachers must have strategies so that students can learn effectively and efficiently. So that students become active during the learning process [3]. In relation to the research that the researcher will do, it is necessary to conduct research with an appropriate and appropriate learning model. A model that can be applied to improve students' mathematical literacy skills is the *Discovery Learning* learning model. The *Discovery Learning* model in this study provides opportunities for students to be able to play an active role in the activities of finding their own ideas and passing down concepts by themselves so that students better understand the concepts obtained and develop the problem-solving skills obtained.

The *Discovery Learning* learning model is one of the learning alternatives that can be practiced in mathematics learning. The Discovery *Learning* learning model is a learning model that is delivered not in its final form but students are expected to organize themselves. Discovery *Learning* requires students to be able to do many things, such as finding information, comparing, organizing, grouping, analyzing, integrating, reorganizing materials and getting final conclusions [4].

Based on the background of the problem, the researcher will test the completeness of the *Discovery Learning* learning model on the mathematical literacy of students.

2   METHODOLOGY

The type of research used in this study is experimental research, because this study seeks the completeness of the *Discovery Learning* learning model on the mathematical literacy of students. There are two groups/samples in this design, namely the experimental class and the control class. The determination of the experimental class was carried out using the *clsster random sampling technique.*

The population in this study is all grade X students of SMA Negeri 3 Brebes for the 2022/2023 academic year, totaling 365 students.

The sample determination in this study was taken randomly using *cluster random sampling*, which is taking three class groups from ten existing classes. The samples were drawn to be used as experimental classes, control classes, and trial classes. The results of the drawing process were obtained class X E-3 was taken as an experimental class, class X E-8 was taken as a control class, and class X E-2 was taken as a trial class.

The independent variable in this study was *Discovery Learning* (X). The dependent variable in this study was Mathematical Literacy (Y).

Table 1. *Research Design.*

Group	Treatment	*Post-test*
Experiment	X_1	0_1
Control	X_2	0_2

Information:

X_1 = Mathematics learning with *the Discovery Learning* learning model

X_2 = Mathematics learning with Conventional learning models

0_1 = Giving a final test (*posttest*) in the experimental class

0_2 = Provision of final test (*posttest*) in the control class

The research design above has two groups, each of which was selected by cluster random sampling. Furthermore, the experimental class was taught using the *Discovery Learning* learning model and the control class was taught using the conventional learning model. At the last meeting, each class was given a final test to determine the results of students' mathematical literacy skills. This research is to determine the completeness of the *Discovery Learning* learning model*.*

3   RESULT

This study was used to determine the completeness of the *Discovery Learning* learning model on Mathematical Literacy in Students.

3.1   Descriptive Analysis

3.1.1   Mathematics learning outcomes of grade X Phase E-3 students

Specify abbreviations and acronyms when they are first used in the text, even after they have been defined in the abstract. Do not use abbreviations in titles or heads unless unavoidable.

3.1.2   Subsection: Guidelines for Figures and Tables

The distribution of *posttest* scores is the distribution of values obtained by students who are treated in the form of a *Discovery Learning* learning model, and control classes taught using a conventional learning model, can be seen in the following table:

Table 2. Experimental Class Data Distribution

Value	Frequency
59-65	7
66-72	11
73-79	7
80-86	6
87-93	5
Sum	36

Table 3. Control Class Data Distribution

Value	**Frequency**
57-63	8
54-70	13
71-77	9
78-84	3
85-91	3
Sum	**36**

Data on the ability of Mathematical Literacy participants in experimental classes taught using the *Discovery Learning* learning model and control classes taught using conventional learning models obtained the results of Mathematical Literacy ability tests on statistical material. After testing the experimental class using the *Discovery Learning* learning model and the control class with the Conventional learning model, statistical descriptive results were obtained in the form of average, median, mode, standard deviation, variance, minimum value, maximum value, range. It can be seen in the following table:

Table 4. Results of Descriptive Analysis of the Experimental Class and Control Class.

Data	Experimental Class	Control Class
Max Value	92	88
Minimum Value	59	57
Range	33	31
Mean	73.61	70.53
Median	73	70
Mood	70	70
Variances	87.39	68.37
Standard Deviation	9.35	8.27

3.2 Inferential Analysis

3.2.1 Normality Test

The normality test is used to find out whether the data is normally distributed or not. Statistical hypotheses used:

H_0 : the sample comes from a normally distributed population

H_α : the sample comes from a population not normally distributed

The normality test can use the Lilifors test, then the data is said to be normally distributed if the value L_{hitung} is less than L_{tabel} the significance level of 5%.

The conclusion of the normality test data of the experimental class and the control class is that the sample comes from a normally distributed population because it L_{hitung} is less than L_{tabel} .

3.2.2 Homogeneity Test

The homogeneity test is used to determine whether the sample data comes from a population that has homogeneous diversity or not. Statistical hypotheses used:

H_0: the sample comes from a population that has homogeneous diversity
H_a: the sample comes from a population that has inhomogeneous diversity

The data in the homogeneity test were obtained using the Bartlett test and consulted with the *chi-squared* table. If the calculated value is $x^2{}_{hitung}$ less than x^2_{tabel} , then the population has homogeneous diversity.

From the results of the calculation of homogeneity testing between the experimental class and the control class k obtained the results of $x^2_{hitung} = 0{,}5251$ and $x^2_{tabel} = 5{,}9910$. Because x^2_{hitung} it is less than x^2_{tabel} then Ho is accepted. It can be concluded that the experimental class and the control class have the same variance or homogeneous.

3.2.3 Test the hypothesis

Based on the test calculation results, the proportion of one right party is obtained $t_{hitung} = 1{,}7629$ and $t_{tabel} = 1{,}6901$. Because more than then rejected $t_{hitung} t_{tabel} H_0$ and H_a accepted. It can be concluded that the mathematical literacy ability of students taught using the *Dsicovery Learning* learning model whose value is more than KKM exceeds 60%.

4   CONCLUSION

Based on the results and discussion in this study, it can be concluded that there is a completeness of the *Discovery Learning* learning model on Mathematical Literacy in Students. The results of this study showed that the value of students taught using the discovery Learning learning model 60% reached KKM 70. This can be seen from the number of students as many as 36 students who get scores above KKM, which is 23 students.

ACKNOWLEDGMENTS

REFERENCEI

[1]O. Pernandes and A. Asmara, "Mathematical Literacy Skills Through Discovery Learning Model in Junior High School," *J. Educator. Mat. Raflesia*, vol. 5, no.   1, pp. 140–147, 2020, [Online]. Available: https://ejournal.unib.ac.id/index.php/jpmr

[2] P. A. Sari, Ponoharjo, and S. Rokhman, "The Effectiveness of Contextual Teaching and Learning Learning Model on Mathematics Learning Interest and Achievement," *J. Educator. MIPA Pancasakti*, vol. 3, no. 2, pp. 108–115, 2019. https://e-journal.upstegal.ac.id/index.php/jpmp/article/view/1419

[3]   Fatkhurozi, S. (2019). The effectiveness of the Horray Course Review learning model on the activeness and achievement of learning mathematics.*Page 40 of 45. 2*(d), 40–45. https://integral.upstegal.ac.id/index.php/jppm/article/view/37

[4]M. H. Nining Mariyaningsih, *NOT AN ORDINARY CLASS: Theory and Practice of Various Learning Models and MethodsLearning Innovation in Inspirational classes*, 1st ed. kekata group, 2018.