INFLUENCE MODEL DISCOVERY LEARNING WITH APPROACH TEACHING AT THE RIGHT LEVEL TO ABILITY COMMUNICATION MATHEMATICAL PARTICIPANT EDUCATE

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Abstract

This research aims to describe 1) the influence of the discovery learning model with the TaRL approach on students' mathematical communication abilities, 2) the mathematical communication abilities of students who are taught using the discovery learning model with the TaRL approach are better than using conventional learning models. Samples were taken using purposive sampling, this research involved three sample classes: control, experimental, And test try. Data collected through documentation And test with instrument Which has been tested validity, reliability, power different, and level the difficulty. Analysis data is carried out using the Dummy Regression test and right-sided t test after testing normality and homogeneity. The results of the research show that there is a significant influence of the discovery learning model with the TaRL approach on students' mathematical communication skills, with internal students group Discovery Learning show results Which more tall. Findings This indicates that The mathematical communication skills of students who are taught using the discovery learning model with the TaRL approach are better than using conventional learning models

Say key: *Discovery learning* , TaRL, communication skills mathematical.

1 INTRODUCTION

Mathematics is a compulsory subject at every level of education. An Indonesian encyclopedia states that mathematical terms come from the Greek word "Mathematicos" which means exact science or "Mathesis". means instructive, abstract and deductive information from which conclusions cannot be drawn based on sensory experience, but on conclusions made through reasoning based on certain rules (Indasari & Ambarawati, 2023).

In Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, education is regulated as a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential. In order to achieve these educational goals, education in Indonesia is divided into several levels, including kindergarten, elementary school, middle school, high school and college. Each level has a number of mandatory subjects, one of which is mathematics.

Learning mathematics has the task of developing students' critical, logical, creative and collaborative thinking talents that need much more in their lives from now on. As stated in the content standards in primary and secondary education units, mathematics lessons on this topic must be given to all participants to equip elementary school students to become student participants who are able to think logically, analytically, systematically, critically, creatively and collaboratively (Sariningsih & Kadarisma , 2016).

Communication is an important skill for students to master in learning mathematics because in building the foundation of their knowledge, students need to use their communication skills such as listening, asking, explaining again, and working together (Paridjo in Rakhmawati, Paridjo, and Sholikhakh 2019). Oral and written communication can bring students closer to understanding mathematics in depth. Charts, diagrams, graphs, symbols, symbols and equations are commonly used communication tools mathematics. Tables , charts and graphs help students draw conclusions, predictions and new questions. Students learn by observing patterns and similarities conveying an understanding of the sequence and subsequent repetition to symbolize with images or symbols (Khadijah et al ., 2018)

Mathematical communication skills are very important in the learning process in the classroom. Mathematical communication is the ability to convey mathematical ideas through various forms, such as language, notation, or symbols, which help in understanding, interpreting, describing relationships, and solving contextual problems through mathematical models, both orally and in writing. This mathematical communication ability is the main indicator of the extent of students' understanding of mathematics (Lubis et al., 2023). However, the results of observations during PLP at SMP Negeri 1 Tegal show that students' mathematical communication skills tend to be quite low.

PTS shows several things, such as students' lack of ability in mathematical grammar such as the use of symbols/notation and appropriate mathematical operations, difficulties in understanding discourse mathematics with how to explain ideas in a way relevant, give rational reasons For something statement, And limitations in convey idea mathematics in algebraic forms and solving problems sequentially.

By Because That, For increase ability communication mathematical participant students need an appropriate learning model. One learning model that can be used to improve students' mathematical communication skills is model Discovery Learning . Model Discovery Learning has a goal, namely, increasing participant activity students in learning, reducing dependence on teachers as the only source of information needed by participants educate , train participants educate to investigate or use the environment as information, which is never perfect.

Apart from that, there are characteristics of the Discovery Learning model including research and problem solving with a focus on training participants, activities to connect existing knowledge and new information. Learning with the discovery model. In this case the teacher only acts as a supervisor and guide for the participants. Educate when discovering new information. The teacher only organizes learning for the participants Students can be guided and directed to discover new information. Participant activities educate inside to discover concepts, namely by guiding participants students make observations, classify, hypothesize, explain, draw conclusions, and so on.

Discovery Learning learning model , learning media can also be used to improve learning ability communication mathematical participant educate. Every participant Students have different developmental approaches. The TaRL approach offers flexibility in teaching students' abilities. This approach is created by adjusting achievements level of ability and needs of participants educate . Participant Education is not tied to grade level, but is adjusted to the same student's abilities. In each class , there is a teacher who meets with the participants students who learn very quickly, and there are also those who learn to understand the material presented slowly.

This can happen because it is affected by many factors. One reason that could be the reason is that the student's level does not meet the assigned learning or achievement level. Teachers must implement the TaRL concept first in make an assessment . The purpose of this assessment is to determine students' skills, potential and needs. So that teachers know where their development and achievements are where student learning is (Suharyani et al ., 2023).

This research wants a change in the form of renewal in mathematics learning. The reform in learning in question is the use of learning models that can attract students' interest in learning mathematics and can develop students' thinking abilities to the maximum so that they can easily develop students' thinking abilities to the maximum and can improve communication skills. mathematical students.

This research aims to find out whether the Discovery Learning learning model with the TaRL approach can improve students' mathematical communication skills on the main subject of Statistics. This research uses an experimental method with a population of students in class VIII semester II of SMP Negeri 1 Tegal academic year 2023/2024. Results study This expected can give information And knowledge that there is model learning Which capable increase ability communication mathematical Statistics material students using the TaRL approach.

In the learning process, there is a close relationship between teachers, students, curriculum, facilities and infrastructure. Teachers have the task of choosing the right learning model according to the material presented 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. (Fatkhurozi et al ., 2019)

In this research, it is necessary to carry out research with appropriate and appropriate learning models. Models that can be applied to improve communication skills students ' mathematics is a Discovery Learning model . The Discovery Learning model in this research provides opportunities for students to play an active role in discovery activities their own ideas and derive concepts by themselves so that students better understand the concepts acquired and develop communication skills mathematically

obtained.

2 METHODOLOGY

This research uses an experimental method with a quantitative approach. The research design uses Posttest-Only Controls Design. On study This study compares the influence of the *discovery learning model* with the TaRL approach on students' mathematical communication abilities on the main subject of statistics and the mathematical communication abilities of students taught using the *discovery learning model* with the TaRL approach are better than using conventional learning models.

Population from study This is participant educate class VIII JUNIOR HIGH SCHOOL Country 1 Tegal Year Teachings 2023/2024. In this research, there are three sample classes: control class, experimental class, and trial class. Method taking sample Which used is purposive sampling . Sampling is carried out based on the objectives that the researcher has set so that they comply with the criteria and can achieve these objectives and from results taking sample obtained class VIII C as class experiment, class VIII F as the control class, and class VIII G as the test class.

The test instrument in the research consisted of a test of students' mathematical communication abilities. Mathematical communication skills test in the form of 6 essay questions which have been proven valid by a team of experts. The dummy regression test and right-hand t test are used to calculate the research hypothesis.

3 RESULTS

The research obtained data from the methods used, namely tests and documentation. This method is used For know ability communication mathematical participant educate with the Discovery Learning model with the TaRL approach and conventional learning models on the main material of Statistics for class VIII.

3.1 Test Instrument

3.1.1 Validity test

Calculation of test validity is produced using mathematical communication ability test data. Mathematical communication ability test number one got the result r_{xy} = 0.719. Furthermore confirmed on table For N = 32 level significance 5% (0.05) obtained r_{tabel} = 0.349 . Because r_{hitung} mathematical communication ability test greater than r_{tabel} then the test of student number one's mathematical communication skills is declared valid. To assess the validity of the test, use the product moment correlation formula, namely (Lestari and Yudhanegara, 2017):

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{[N \sum X^2 - (\sum X)^2][N \sum Y^2 - (Y)^2]}}$$

Table 1. *Test validity test ability communication mathematical students*

No	r_{hitung}	r_{tabel}	Information
1	0.719	0.349	**VALID**
2	0.674	0.349	**VALID**
3	0.509	0.349	**VALID**
4	0.479	0.349	**VALID**
5	0.727	0.349	**VALID**
6	0.352	0.349	**VALID**
7	0.498	0.349	**VALID**

3.1.2 Reliability Test

Test instruments that have a valid index category in the results of trials testing students' mathematical communication skills can basically be used, and reliability tests are carried out to see whether each question item used is convincing enough to be used again.

Table 2. *Test reliability test ability communication mathematical learners*

No	Variable	r_{hitung}	r_{tabel}	Information
1	Ability Communication Mathematical	0.598	0.349	**RELIABLE**

3.1.3 Test Level Difficulty

The test difficulty levels are shown in the table below. Based on the findings of determining the level of difficulty for each test, use the following formula (Lestari and Yudhanegara, 2017).

$$IK = \frac{\bar{X}}{SMI}$$

Table 3. *Test level difficulty test ability communication mathematical students*

No	$Indeks\ Kesukaran$	Information
1	0.65	**CURRENTLY**
2	0.34	**CURRENTLY**
3	0.21	**HARD**
4	0.05	**HARD**
5	0.42	**CURRENTLY**
6	0.38	**CURRENTLY**
7	0.11	**HARD**

3.1.4 Test Power Differentiator

To find the results of the differentiating power of the communication skills test, use the following formula (Lestari and Yudhanegara, 2017).

$$DP = \frac{\bar{x}_A - \bar{x}_B}{SMI}$$

Table 4. *Test Power differentiator test ability communication mathematical students*

No	$Daya\ Pembeda$	Information
1	1.30	**VERY GOOD**
2	0.67	**GOOD**
3	0.41	**GOOD**
4	0.11	**BAD**
5	0.83	**VERY GOOD**
6	0.77	**VERY GOOD**
7	0.22	**ENOUGH**

3.1.5 Test Precondition

3.1.6 Normality test

Calculation test normality with use test liliefors can seen on table following.

Table 5. *Test normality data ability communication mathematical students*

No	Variable	L_{hitung}	L_{tabel}	Information
1	Class Experiment	0.114	0.157	NORMAL
2	Class Control	0.106	0.157	NORMAL

3.1.7 Homogeneity Test

Based on calculation can concluded that $F_{hitung} \leq F_{tabel}$ or with say other second homogeneous class. The following table presents a summary of the results of the homogeneity test on the two samples:

Table 6. *Test homogeneity data ability communication mathematical learners*

No	Variable	F_{hitung}	F_{tabel}	Information
1	Ability Communication Mathematical	1,278	1,822	HOMOGENEOUS

3.2 Test Hypothesis

3.2.1 Test Hypothesis First

Calculation results test hypothesis First, obtained that $Fhitung$ = 4,814 > $Ftabel$ = 3,996 so $H0$ is rejected, which means there is a significant influence of the discovery learning model with the TaRL approach on students' mathematical communication skills.

3.2.2 Test Hypothesis Second

Calculating the results of the second hypothesis test, it is found that $thitung$ = 2,192 > $ttabel$ = 1,999 so that $H0$ rejected Which It means The mathematical communication skills of students who are taught using the discovery learning model with the TaRL approach are better than using conventional learning models.

4 CONCLUSION

From research conducted at SMP Negeri 1 Tegal, it was concluded that there was an influence of the discovery learning model with the TaRL approach on students' mathematical communication abilities and the mathematical communication abilities of students who were taught using the discovery learning model with the TaRL approach were better than using conventional learning models.

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