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THE INFLUENCE OF THE DISCOVERY LEARNING LEARNING MODEL *WITH THE HELP OF* POWERPOINT *LEARNING MEDIA* ON THE MATHEMATICAL COMPREHENSION ABILITY AND *SELF-EFFICACY OF* JUNIOR HIGH SCHOOL STUDENTS

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ABSTRACT

This study aims to determine the influence of discovery learning learning models *with the help of* powerpoint *learning media* on students' mathematical understanding ability and *self-efficacy*. The method carried out in this study is quantitative using the type of experimental research. The population in this study was all grade VII students of SMPN 1 Puloampel, samples were taken using *purposive sampling* techniques so that the samples obtained were class VII-A students as a control class and class VII-B as an experimental class with 25 students in each class. The data collection technique uses 5 items of essay tests, students' mathematical comprehension abilities, and *self-efficacy* questionnaires. From the results of data analysis, it shows that *the discovery* learning learning model with the help of *powerpoint learning media* on students' mathematical understanding ability and *self-efficacy* is better than conventional learning.
Keywords: *discovery learning, powerpoint,* students' mathematical understanding, *self efficacy*

INTRODUCTION

Mathematics is one of the subjects taught from elementary school to high school level. According to (Surur *et al*., 2019) Mathematics is closely related to everyday life, Because every activity everyday always prosecute somebody to be able to master mathematics. According to (Sabina, 2019) Mathematics too role-playing Important in Multiple Fields science others and contribute to the development of ways of thinking human. Therefore, students are expected to master mathematics, because by mastering mathematics facilitate the understanding of other subjects.

An attitude that appreciates the usefulness of mathematics in life is curiosity, interest and an interest in studying mathematics, as well as Determination and belief in solving problems. Supported by opinions (Ranti &; Kurniati, 2020) Mathematics can views as a mutual system Related which consists of from ideas, principles, and process. Therefore, the relationship between these aspects should not built with Emphasis in memory or memorization, instead on reasoning or intelligence. The important thing in learning mathematics is the achievement of the learning objectives themselves, namely ability Mathematical or ability in order to Students can understand something based on ability his learning experience.Mathematical skills in students are essential for students to achieve a goal in learning mathematics.

Mathematical skills in students are essential for students to achieve a goal in learning mathematics. According to (Rahmi *et al*., 2020) ability Mathematics students Indonesia is significantly pay attention. According to the results of observations made by researchers, students' mathematical comprehension ability is still relatively low. Understanding is a process Activities and how to understand. It is said so because for reach Directions of understanding Needed Learning

and Thinking Activities continuous. According to (Moreno, 2018) Activities can distinguish, Modify preparing, presenting, organizing, Interpret explain, demonstrate, model, evaluate, ensure and make up your mind. Means One-level understanding higher than rote memorization.

Based on observations made with students at SMPN Puloampel in grade VII. A person is said to understand something when they are able to construct meaning from instructional messages such as oral, written or graphic communication, and make connections between new information integrated into pre-existing cognitive schemes. Then the low mathematical ability of students, such as students' mathematical comprehension ability and problem-solving ability.

Then the low *Self efficacy* A student's mathematics can also affect a student's mathematical understanding. According to (Hamidah &; Kusuma, 2022) *Self efficacy* be Aspects that has influence Significant to student success In completing Tasks and troubleshooting. Low *Self efficacy* This mathematics is evident in the lack of courage and confidence in students. Where students feel embarrassed to argue, ask, answer, and come to the front of the class. When someone is able to answer the teacher's questions, it is still accompanied by doubts about the results obtained and a lack of courage in students so that they are slow to process and absorb knowledge *(Hamidah et al*., 2022).

One of the efforts that teachers can do is to change the way we learn mathematics from the old way. However, by learning mathematics that provides opportunities or experiences for students to solve problems in different situations, namely by applying the discovery learning learning model with the help of powerpoint learning media This invites students to understand the understanding of mathematical concepts better. The teacher serves as a guide, through the teacher's questions, the student discovers for himself knowledge that he does not yet know.

Learning model *Discovery Learning* Able to develop students' higher-order thinking processes both critical thinking and creative thinking. According to (Ariawati *et al., 2021)* Model usage Learning *Discovery Lerning* get give meaningful learning for students because Students learn through discovery, they can combine knowledge that Retrieved During discovery or Knowledge that they have had in the past.

Learning through application type *Discovery Learning* Supported with media Learning *PowerPoint* whose utilization can arouse desire and interest, arouse motivation and Refreshing learning activities. Learning media *PowerPoint* is one of the learning media that helps teachers in learn. According to (Ariawati *et al*., 2021) *Powerpoint* be Application Program presentation that included with *Microsoft Office* which can attract the attention of students due to the use of color, video view and picture and has templates that Versatile and unique. As for according to (Asriningsih *et al*., 2021) *Powerpoint* used as Tools to improve Student attraction to follow learning, so that students get easier understand the subject and improve students' mathematical understanding.

Based on the description above, researchers conducted a study that focused on the application of *discovery* learning learning models with the help of *powerpoint learning media to students' mathematical* understanding abilities and students' mathematical *self-efficacy*. Students' mathematical comprehension ability and *mathematical self-efficacy* are applied based on what is a problem in the environment that requires solving it.

RESEARCH METHODS

The subjects of this study were 25 students of grade VII B SMP Negeri 1 Puloampel for the 2023/2024 academic year. In this research method, it is an experimental quantitative method involving two class groups, namely the experimental class and the control class, with the experimental class receiving a *discovery* learning learning model

with the help of *powerpoint* learning media and control using conventional learning.

Data Collection Techniques

The data used in this study is test result data. The test consists of a number of questions made according to the variable indicators studied and each answer to the question item has a score guideline that is considered correct. In this study, the test made based on variable indicators of students' mathematical comprehension ability consisted of 5 description questions. By using the test technique, data will be obtained in the form of scores from tests that have been given in the experimental class and control class. The tests used in this study were *pretest* and *postest*.

Data Analysis Techniques

1. *Test Data Analysis Techniques*

   Data analysis in this study used descriptive techniques and statistical analysis tests. Descriptive techniques are obtained through pretest and posttest results in the experimental class and control class groups in the form of mean values, minimum values, maximum values, and standard deviations. Furthermore, statistical analysis tests are obtained through normality tests, homogeneity tests, and t tests.

2. *Questionnaire Data Analysis Techniques*

   The research questionnaire uses a likert scale in the form of a checklist (√) consisting of two types of questions, namely positive questions and negative questions with 4 categories of responses chosen, namely Strongly Agree (SS), Agree (S), Disagree (TS), and Strongly Disagree (STS). The weight of each question on the scale of student attitudes towards students' *mathematical self-efficacy* through discovery learning is *presented in the table after which the percentage of student attitudes towards the implementation of learning is seen.*

RESULTS AND DISCUSSION

Before conducting the t-test, normality and homogeneity of *pretest and* posttest data were first tested on the *students' mathematical comprehension ability test and descriptive analysis by looking for the average value and percentage on the mathematical self-efficacy questionnaire* . The following are presented the normality test results of the experimental class and the control class

Table 1 . Normality test results

Data	Sig value. *Pretest*	Sig value. *posttest*
Experiment	0.125	0.115
control	0.145	0.097

Based on table 1 shows that the significant values for the experimental class *pretest* and the control class were 0.125 and 0.145 respectively where Sig.> 0.05. Moreover, for the *experimental class posttest* and the control class respectively amounted to 0.115 and 0.097 where Sig.> 0.05. This shows that the research data is typically distributed.

Table 2. Homogeneity test results

Class	Sig value. *Pretest*	Sig value. *posttest*
Experiments and Controls	0.242	0,151

Based on table 2 shows that the value of sig. *The pretest and posttest experimental class and control class are 0.242 and 0.151, which means the value of Sig.> 0.05, This means that the pretest* and posttest value *data* from both sample groups are homogeneous. Therefore it can be continued with the mean difference test (t-test). Here are the results of the mean difference test (t-test)

Table 3. Test results mean difference(t-test)

Class	Sig value. *Pretest*	Sig value. *posttest*
Experiments and Controls	0.955	0.000

Based on the test calculations, the difference in the average pretest in the *experimental class and* the control class can be obtained Sig. (2-tailed) of 0.955 > 0.05 so that it is accepted and rejected. Because it was accepted and rejected, it can be concluded that there is no difference in the initial ability of the experimental class students with the control class. Moreover, the calculation results of the average difference test in the experimental class and the control class obtained a value on Sig. (2-tailed) of 0.000 0.05 so that it was rejected and accepted. Because it is rejected and accepted, it can be concluded that the mathematical understanding ability of students between $H_0 H_1\ H_0\ H_1 < H_0 H_1\ H_0\ H_1$ *The discovery* learning learning model with the help of *powerpoint* learning media is better than the conventional learning model.

Table 4. Descriptive test results of questionnaire

Information	N	Min	Max	Mean	Std.deviation
Experimental Questionnaire	25	70	76	74,76	2,1656

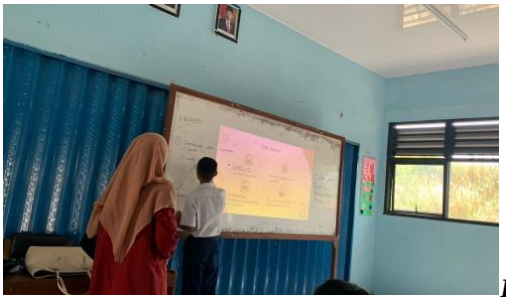
Based on table 4, it can be seen from 25 experimental class respondents who filled out the questionnaire *Self efficacy* Mathematically students in the experimental class have an average score 74,76 with a maximum value of 76 and a minimum value of 70 and standard deviation 2,1656.

Table 5. Percentage Results Self-efficacy indicators

No.	Indicators	Max Score	Percentage	Criterion
1.	Able to overcome the problems encountered	299	71%	Strong
2.	Confident in his success	220	75%	Strong
3.	Dare to face challenges	302	76%	Strong
4.	Dare to Take Risks	302	79%	Strong
5.	Realizing his strengths and weaknesses	450	75%	Strong
6.	Able to interact with others	374	70%	Strong
7.	Tough or not easy to give up	222	73%	Strong
Average number			74%	Strong

Based on table 5 of the percentage results in the table that the average number of indicators of *the self-efficacy questionnaire is 74%, it shows that the* self-efficacy questionnaire *has vital criteria.*

At the time of learning, there are several advantages encountered during discovery *learning learning* powerpoint learning *media assistance* , namely student curiosity is increasing so that students are more active in following the learning process taking place.



Picture 1. Students do the questions

The picture above shows that students have dared to express what they get as long as they are given the opportunity to understand the learning first before finally being given a more in-depth explanation by the teacher.

According to (Astiti *et al*., 2021) This model is used to develop active learning methods by discovering yourself, investigating yourself, then the results that will be obtained last a long time in memory so that students do not easily forget them.

The next advantage encountered during learning is the growing skills of students.

Picture 2. Students discuss Solving Problems

The picture above shows that students' skills are progressing with students who are discussing to find their problem solutions before finally being deepened by the teacher. In the syntax of *discovery learning* students are asked to identify problems, this can be seen in figure 2 which shows students are very actively discussing solving given problems, thus honing students' mathematical understanding skills.

According to (Restika, 2021) says that model learning *Discovery learning* can improve students' skills and abilities, with a learning process that provides opportunities for students to find their problem solving so that students are more active in learning.

REFERENCES

Ariawati, K. N., Suarjana, I. M., & Sudarmawan, G. A. (2021). Implementasi Model Discovery Learning Berbantuan Powerpoint Terhadap Hasil Belajar IPA. *Jurnal Imiah Pendidikan Dan Pembelajaran*, *5*(2), 332. https://doi.org/10.23887/jipp.v5i2.36781

Asriningsih, N. W. N., Sujana, I. W., & Sri Darmawati, I. G. A. P. (2021). Penerapan Model Discovery Learning Berbantuan Media Powerpoint Meningkatkan Hasil Belajar IPS Siswa SD. *Mimbar Ilmu*, *26*(2), 251. https://doi.org/10.23887/mi.v26i2.36202

Astiti, N. K. A., Rini Kristiantari, M. G., & Saputra, K. A. (2021). Efektivitas Model Pembelajaran Discovery Learning Dengan Media Powerpoint Terhadap Hasil Belajar IPA Siswa SD. *Journal of Education Action Research*, *5*(3), 409–415. https://doi.org/10.23887/jear.v5i3.36695

Hamidah, H., & Kusuma, J. W. (2022). The Effect of ARIAS Model Learning on Mathematical Writing Skills Reviewed from Self-Efficacy. *Indonesian Journal of Mathematics Education*, *4*(2), 37–44.

Hamidah, H., Kusuma, J. W., Zaenuri, Z., Isnarto, I., & Agoestanto, A. (2022). Pengaruh Model ARCS (Attention-Relevance-Confidence-Satisfaction) Terhadap Kemampuan Penalaran Matematis dan Self Confidence Siswa. *Prosiding Seminar Nasional Pascasarjana (PROSNAMPAS)*, *5*(1), 441–446.

Kusuma, J. W., Yusuf, F. A., Sukmawati, S., Saumi, T. F., Romdhoningsih, D., Mahpudoh, M., ... & Hamidah, H. (2023). PEMANFAATAN TEKNOLOGI INFORMASI BERBASIS INTERNET DAN MEDIA INTERAKTIF DALAM MENUNJANG PEMBELAJARAN JARAK JAUH DI SEKOLAH DASAR TERANGGANA KASEMEN SERANG. Community Development Journal: Jurnal Pengabdian Masyarakat, 4(2), 1277-1281.

Moreno, L. (2018). Penerapan Metode Discovery Learning untuk Meningkatkan Kemampuan Pemahaman Matematis Siswa Kelas VII SMPN 25 Pekanbaru. *Jurnal Pendidikan Tambusai*, *2*(6), 1401–1428.

Rahmi, Febriana, R., & Putri, G. E. (2020). Pengaruh Self-Efficacy terhadap Pemahaman Konsep Matematika dengan Menerapkan Model Discovery Learning pada Siswa Kelas XI MIA 1 SMA N 5 The Effect of Self-Efficacy on Understanding Mathematical Concepts by Applying the Discovery Learning

Model to XI MIA. *Jurnal Pendidikan Matematika*, *10*(1), 27–34.

Ranti, F., & Kurniati, A. (2020). Pengaruh Penerapan Model Pembelajaran Group Investigation (GI) terhadap Pemahaman Konsep Matematis Siswa berdasarkan Self-Efficacy Siswa SMP/MTs. *JURING (Journal for Research in Mathematics Learning)*, *3*(1), 021. https://doi.org/10.24014/juring.v3i1.9013

Restika Dewi, K. (2021). Penerapan Model Pembelajaran Discovery Learning Dengan Media Zoom Untuk Meningkatkan Kemampuan Membaca Pemahaman Bahasa Inggris Pada Smk Negeri 1 Amlapura Tahun Pelajaran 2020/2021. *Jurnal Lampuhyang Lembaga Penjaminan Mutu STKIP Agama Hindu Amlapura*, *12*(2), 121–136. https://doi.org/10.47730/jurnallampuhyang.v12i2.276

Sabina, F. (2019). Penerapan Discovery Learning Dengan Pendekatan Scientific Dalam Meningkatkan Kemampuan Pemahaman Konsep dan Kemampuan Penalaran Matematis serta Dampaknya Terhadap Self Regulated Learning Siswa SMP. *Jurnal Madani : Ilmu Pengetahuan, Teknologi, Dan Humaniora*, *2*(2), 201–215. https://doi.org/10.33753/madani.v2i2.52

Surur, M., Oktavia, S. T., Prodi, D., Ekonomi, P., Prodi, M., & Ekonomi, P. (2019). Pengaruh Model Pembelajaran Discovery Learning. *Jurnal Pendidikan Edutama*, *6*(1), 11–18.