

---

# IMPLEMENTING DISCOVERY LEARNING TO IMPROVE STUDENTS' MATHEMATICS ACHIEVEMENT ON LINEAR EQUATIONS AND INEQUALITIES IN ONE VARIABLE

Nur Alya Aprila Ali<sup>1</sup>, Sarson W. Dj. Pomalato<sup>2</sup>, Nancy Katili<sup>3</sup>

<sup>1</sup>Universitas Negeri Gorontalo, Jl. Prof. Dr. Ing. B. J. Habibie, Gorontalo, Indonesia.

[alyaaprilaali26@gmail.com](mailto:alyaaprilaali26@gmail.com)

<sup>2</sup>Universitas Negeri Gorontalo, Jl. Prof. Dr. Ing. B. J. Habibie, Gorontalo, Indonesia.

[sarson@ung.ac.id](mailto:sarson@ung.ac.id)

<sup>3</sup>Universitas Negeri Gorontalo, Jl. Prof. Dr. Ing. B. J. Habibie, Gorontalo, Indonesia.

[nancy.katili@ung.ac.id](mailto:nancy.katili@ung.ac.id)

---

## ARTICLE INFO

### Article history:

Received Sep 12, 2025

Revised Sep 13, 2025

Accepted Sep 19, 2025

### Keywords:

Mathematics Achievement  
Discovery Learning  
Linear Equation and  
Inequalities in One Variable

---

## ABSTRACT

The difficulties often experienced by students in learning linear equations and inequalities are caused by the lack of student involvement in the process of understanding the meaning behind symbols, algebraic forms, and learning models that are less suitable for the conditions of students who are still dominated by teachers. The mismatch between the learning model and students' needs will later have an impact on learning outcomes. This study aims to improve students' mathematics learning outcomes through the Discovery Learning model on the subject of linear equations and inequalities of one variable in Class VII-1 MTs Al-Khairaat Kwandang. This study is classroom action research (CAR) with qualitative research methods. The subjects in this study were all 25 students of class VII-1 MTs Al-Khairaat Kwandang. Data collection techniques were carried out through observation and essay tests. The results of the study showed that in cycle I the learning activities were quite good with student learning completeness of 40% (cognitive), 42% (affective), and 45% (psychomotor). In Cycle II, the learning activities reached the good and very good categories. Learning outcomes showed a significant increase where cognitive mastery increased to 84%, affective 84%, and psychomotor 83%. So it can be concluded that the Discovery Learning model has proven effective in improving the mathematics learning outcomes of class VII-1 students at MTs Al-Khairaat Kwandang.

Copyright © 2025 IKIP Siliwangi.

All rights reserved.

---

### Corresponding Author:

Nur Alya Aprila Ali,  
Department of Mathematics Education,  
Universitas Negeri Gorontalo,  
Jl. Prof. Dr. Ing. B. J. Habibie, Gorontalo, Indonesia  
Email: [alyaaprilaali26@gmail.com](mailto:alyaaprilaali26@gmail.com)

---

### How to Cite:

Ali, N.A.A., Pomalato, S.W.D., & Karili, N. (2025). Implementing Discovery Learning to Improve Students' Mathematics Achievement on Linear Equations and Inequalities in One Variable. *JIML*, 8(4), 711-722.

---

## INTRODUCTION

Education is one of human cultures and civilizations that continues to develop. Through education, humans are also expected to be able to adapt to the rapid changes of the present era;

therefore, education providers must align with the pace of the times. According to (Pauweni & Iskandar, 2021) in the field of science and technology, which continuously drives innovation and change, the role of education—particularly the contribution of mathematics—cannot be separated from these developments. Mathematics is the queen and servant of science. This is reinforced by Atiyah's opinion (as cited in Gufron, Darwan, & Winarso, 2018:78), who stated that mathematics is called "Mathematics is Queen and servant of science," meaning that mathematics serves both as the queen and as a servant of scientific knowledge.

Mathematics is one of the fundamental subjects in formal education and is taught at all levels, from primary and secondary education to higher education. Therefore, a deep understanding of mathematical concepts is essential for students to optimally develop their intellectual potential. The mastery of mathematical concepts largely depends on two factors: the teacher as the facilitator of learning and the students themselves. Students' understanding of mathematical concepts is influenced by the teacher's ability to deliver the material effectively and the students' capacity to absorb the lessons taught. However, in reality, many students perceive mathematics as a boring subject and consider its material difficult. This aligns with the view of (Arham et al. 2023), who state that students' anxiety is not solely caused by the students themselves; the teacher's lack of ability to create a learning environment that fosters students' interest in mathematics is also a contributing factor. Clearly, this has a significant impact on students' learning outcomes.

According to Pakaya et al. (2023), learning outcomes refer to the abilities acquired after participating in various learning processes. Several factors can influence students' learning outcomes, including internal and external factors. Factors that often contribute to low learning outcomes include insufficient practice exercises or discussion activities, as well as ineffective teaching methods, which result in students not meeting the Minimum Completeness Criteria (KKM) set by the school (Manoppo et al., 2022). In addition, the learning model used is often not suitable for the students' conditions. Many teachers still apply conventional models, such as the lecture method, where the teacher dominates the delivery of information. This approach can make it difficult for some students to absorb and understand the material, as not all students are equally skilled at processing information, paying attention, taking notes, and listening. This situation presents both a problem and a challenge for teachers in improving students' learning outcomes.

Based on the results of initial observations, mathematics learning in class VII-1 at MTs Al-Khairaat Kwandang, particularly on the topic of linear equations and inequalities in one variable, still faces several challenges. First, during the learning process, students' participation in class VII-1 is relatively low and tends to be passive, relying solely on the teacher's explanations without actively attempting to understand the material independently. Second, the learning outcomes of students in class VII-1 are still relatively low compared to other classes, as indicated by the fact that most students have not yet achieved the Minimum Completeness Criteria (KKM) set by the school.

Previous research was also conducted by Nursawitri et al. (2023) at SMP Negeri 2 Kutawaringin, Bandung, where almost the same problem was found, namely a lack of conceptual understanding of the material on linear equations and inequalities with one variable, as seen from student learning outcomes in the 2020/2021 Academic Year. Of the 32 students, only 10 students obtained scores above the minimum completion criteria (KKM), while the remaining 22 students obtained scores below the KKM. This was caused by a lack of student interest and motivation, as well as the teacher's learning model which was still monotonous.

The factors and problems mentioned above are evidenced by the results of the daily mathematics tests of class VII-1 students on the topic of linear equations and inequalities in one variable over the past three years, which were relatively low and below the Minimum

Completeness Criteria (KKM) set by the school, namely 75. The following are the data of the daily mathematics test results of class VII-1 students at MTs Al-Khairaat Kwandang on the topic of linear equations and inequalities in one variable over the last three years.

**Table 1.** Average Daily Test Scores of Class VIII-1 on the Topic of Linear Equations and Inequalities in One Variable, Even Semester

Academic Year	Number of Students	Completion Percentage	Description	
			Completed	Not Completed
2021/2022	25	48%	13	12
2022/2023	25	64%	9	16
2023/2024	25	76%	6	19

Source of data: MTs Al-Khairaat Kwandang

Based on Table 1, it can be seen that the percentage of students scoring below the Minimum Completeness Criteria (KKM) of 75 over the past three years is 62.66%. Observations and interviews indicate that many students experience difficulties. These difficulties are often caused by rote-based learning and minimal student involvement in the process of understanding the meaning behind algebraic symbols and forms. Furthermore, the learning model used is still largely teacher-centered and not fully adapted to the students' conditions.

One alternative that can be applied to address these problems is the discovery learning model. This learning model was developed by Jerome Bruner with the aim of encouraging students to discover concepts or knowledge independently through observing, questioning, collecting data, and drawing conclusions. This aligns with (Hosnan's 2014:282) view that discovery learning is a model designed to develop active learning, enabling students to discover and process knowledge on their own, so that the outcomes are retained more reliably and for a longer duration in memory. A distinctive feature of the discovery learning model is that students actively construct their own knowledge through exploration, experimentation, and problem-solving. In this model, the teacher serves as a facilitator who guides the discovery process, rather than merely delivering information.

According to Indri Anugraheni et al. (2018:71), discovery learning is a model that directs students to discover concepts through various information or data obtained from observation and experimentation. Similarly, Dwi Setiaji et al. (2017:21) state that the discovery learning model can train students to learn collaboratively, develop their reasoning skills, and actively engage in the learning process to independently discover and solve problems they encounter without external assistance.

Based on the discussion above, it is considered necessary to implement the discovery learning model, which helps students enhance their self-confidence, engage all students, and increase classroom participation in the mathematics learning process, thereby positively impacting students' mathematics learning outcomes. Therefore, the researcher initiated a classroom action research study entitled "The Implementation of the Discovery Learning Model to Improve Students' Mathematics Learning Outcomes on the Topic of Linear Equations and Inequalities in One Variable in Class VII-1 at MTs Al-Khairaat Kwandang."

## METHOD

This study is classified as Classroom Action Research (CAR), conducted at MTs Al-Khairaat Kwandang, with 25 students of class VII-1 in the even semester of the 2024/2025 academic year as the subjects. As explained by (Haryono, 2015), CAR involves collecting, analyzing, and drawing conclusions from data to determine the effectiveness of actions taken by teachers during the learning process. Through CAR, teachers are expected to find solutions to problems

encountered in teaching while simultaneously enhancing their professionalism in managing the educational process.

The research design follows the model developed by Kemmis & Taggart, which involves four main cyclical stages: (1) planning, (2) action, (3) observation, and (4) reflecting (Kurnaisih, 2014). The reason the researcher chose Classroom Action Research (CAR) is not only to improve teacher performance and enhance the learning process in the classroom, but also to improve and increase students' mathematics learning outcomes, as the procedures in CAR are systematic and well-planned.

The data collection techniques were conducted through observation and tests. Observation was used to determine the activities of teachers and students in applying the Discovery Learning model during mathematics lessons on the topic of linear equations and inequalities in one variable. Meanwhile, tests were used to evaluate the average learning outcomes of students after using the Discovery Learning model. Before being administered, the tests were first validated and tested for reliability using the product-moment correlation coefficient and Cronbach's alpha.

Each set of data obtained from the observation of teacher and student activities, using observation sheets, was analyzed and processed by calculating the number of criteria aspects, namely: Very Good (4), Good (3), Fairly Good (2), and Poor (1). The criterion for successful monitoring of teacher and student activities was achieving at least a Good or Very Good score. Meanwhile, the technique for analyzing students' mathematics learning outcomes used the average percentage formula:

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} \times 100$$

Description :

$\bar{x}$  : Mean score

$\sum_{i=1}^n x_i$  : Sum of all students' scores

$n$  : Number of students

**Table 2.** Criteria for Students' Learning Mastery

Score	Criteria
$\geq 75$	Completed
$< 75$	Not Completed

$$\text{Completeness Percentage} = \frac{\text{Students Completed}}{\text{Total Number of Students}} \times 100\%$$

## RESULTS AND DISCUSSION

### *Results*

The classroom action research was conducted in class VII-1 at MTs Al-Khairaat Kwandang, which consists of students with varying abilities. The research subjects consisted of 25 students,

comprising 12 male and 13 female students. The Classroom Action Research (CAR) was carried out from February to March in the 2024/2025 academic year.

This research consisted of two cycles. Cycle I was conducted over three meetings, with two meetings dedicated to learning activities and one meeting for the end-of-cycle test. Similarly, Cycle II was conducted over three meetings, with two meetings for learning activities and one meeting for the end-of-cycle test. The implementation of Classroom Action Research in both Cycle I and Cycle II consisted of four stages: planning, action, observation, and reflection.

The research data obtained are presented in three categories: (1) data from the observation of teacher activities, (2) data from the observation of student activities, and (3) data on students' mathematics learning outcomes on the topic of linear equations and inequalities in one variable.

### Cycle I

#### Observation Results of Teacher Activities

The observation of teacher activities during the learning process was conducted by observers over two meetings. The observation focused on 18 aspects of the teacher's activities in managing learning using the Discovery Learning model. The results of the teacher activity observations in Cycle I can be seen in Table 3.

**Table 3.** Percentage of Teacher Activity Observation Results in Cycle I

Assessment Criteria	Number of Aspects	
	Meeting 1	Meeting 2
Very Good	2 aspects	3 aspects
Good	6 aspects	5 aspects
Fairly Good	8 aspects	9 aspects
Poor	2 aspects	1 aspects
<b>Total</b>	<b>18 aspects</b>	<b>18 aspects</b>

Based on the table above, it can be seen that the observation results of the teacher's ability to manage learning using the Discovery Learning model in the first meeting were categorized as follows: Very Good (VG) for 2 aspects, Good (G) for 6 aspects, Fairly Good (FG) for 8 aspects, and Poor (P) for 2 aspects. In the second meeting, the results were: Very Good (VG) for 3 aspects, Good (G) for 5 aspects, Fairly Good (FG) for 9 aspects, and Poor (P) for 1 aspect. It can be observed that the teacher's ability to implement the Discovery Learning model had not yet reached the established criteria, which required a minimum of Good (G) or Very Good (VG).

#### Observation Results of Student Activities

The observation results of student activities in Cycle I, based on observations of the opening, core, and closing activities, can be seen in Table 4.

**Table 4.** Percentage of Student Activity Observation Results in Cycle I

Assessment Criteria	Number of Aspects	
	Meeting 1	Meeting 2
Very Good	1 aspects	3 aspects
Good	4 aspects	4 aspects
Fairly Good	8 aspects	9 aspects
Poor	5 aspects	2 aspects
<b>Total</b>	<b>18 aspects</b>	<b>18 aspects</b>

Based on Table 4, it can be seen that the observation results of student activities using the Discovery Learning model in the first meeting were categorized as follows: Very Good (VG) for 1 aspect, Good (G) for 4 aspects, Fairly Good (FG) for 8 aspects, and Poor (P) for 5 aspects. In the second meeting, the results were: Very Good (VG) for 3 aspects, Good (G) for 4 aspects, Fairly Good (FG) for 9 aspects, and Poor (P) for 2 aspects. The study indicates that students' activities achieved through the Discovery Learning model were still, on average, in the Fairly Good (FG) category. This shows that student activities using the Discovery Learning model had not yet reached the established criteria, which required a minimum of Good (G) or Very Good (VG).

#### Students' Learning Outcomes

##### a. Affective Domain

**Table 5.** Students' Learning Outcomes in the Affective Domain in Cycle I

Assessment Criteria	Aspects Assessed										Average Percentage
	Students	% A1	Students	% A2	Students	% A3	Students	% A4	Students	% A5	
Very Good	3	12%	4	16%	5	20%	7	28%	5	20%	19.2%
Good	6	24%	6	24%	6	24%	7	28%	5	20%	24%
Fairly Good	7	28%	9	36%	11	44%	8	32%	9	36%	35.2%
Poor	9	36%	6	20%	3	12%	3	12%	6	24%	20.8%
Total	25	100%	25	100%	25	100%	25	100%	25	100%	100%

Based on Table 5, it is known that the majority of students are in the Good category with an average percentage of 24%, followed by the Very Good category at 19.2%, Fairly Good at 35.2%, and students in the Poor category at 20.8%. Although most students have demonstrated fairly good skills, this achievement still does not meet the established success indicator, which requires at least 80% of students to be in the Good and Very Good categories. In Cycle 1, the students' learning outcomes in the affective domain using the discovery learning model in the Good and Very Good categories only reached 43.2%.

##### b. Cognitive Domain

**Table 6.** Students' Learning Outcomes in the Cognitive Domain of Cycle I

Score	Number of Students	Percentage (%)	Mastery
<75	15	60 %	Not Mastered
≥75	10	40 %	Mastered
		100 %	

Based on the data in Table 6, from the essay test results there were 25 students, of whom 10 students (40%) achieved mastery with a minimum score of 75 in accordance with the KKM. Meanwhile, 15 students (60%) had not yet mastered the material. The scores of students who achieved mastery ranged from 75 to 98, while those who had not mastered the material had scores below 75, with the lowest score being 50.

c. Psychomotor Domain

**Table 7.** Students' Learning Outcomes in the Psychomotor Domain Cycle I

Assessment Criteria	Aspects Assessed								Average Percentage
	Students	% P1	Students	% P2	Students	% P3	Students	% P4	
Very Good	4	16%	5	29%	4	16%	4	16%	19%
Good	8	32%	6	24%	5	20%	7	28%	26%
Fairly Good	11	44%	10	40%	10	40%	11	44%	42%
Poor	3	12%	4	16%	6	24%	3	12%	16%
<b>Total</b>	<b>25</b>	<b>100%</b>	<b>25</b>	<b>100%</b>	<b>25</b>	<b>100%</b>	<b>25</b>	<b>100%</b>	<b>100%</b>

Based on Table 7, the percentage of students who achieved the Good and Very Good categories in the four psychomotor aspects was 45%, while 42% of students were in the Fairly Good category, and 16% of students were in the Not Good category. Although most students have demonstrated fairly good skills, this achievement still does not meet the established success indicator, which requires at least 80% of students to be in the Good and Very Good categories.

**Cycle II**

Results of Teacher Activity Observations

During the learning process in Cycle II, the teacher's activities were observed and evaluated using a pre-designed observation sheet. The observation process focused on 18 aspects divided into three stages: introduction, core, and closing, all related to the implementation of the learning process using the Discovery Learning model. The results of the teacher activity observations in Cycle II can be seen in Table 8.

**Table 8.** Percentage of Teacher Activity Observation Results in Cycle II

Assessment Criteria	Number of Aspects	
	Meeting 3	Meeting 4
Very Good	8 aspect	11 aspect
Good	9 aspect	7 aspect
Fairly Good	1 aspect	0 aspect
Poor	0 aspect	0 aspect
<b>Total</b>	<b>18 aspect</b>	<b>18 aspect</b>

Based on Table 8, it can be seen that the results of observations on the teacher's ability to manage learning using the Discovery Learning model, which were observed and assessed in the third meeting, showed 8 aspects in the Very Good (VG) category, 9 aspects in the Good (G) category, 1 aspect in the Fairly Good (FG) category, and 0 aspects in the Not Good (NG) category. In the fourth meeting, the results showed 11 aspects in the Very Good (VG) category, 7 aspects in the Good (G) category, 0 aspects in the Fairly Good (FG) category, and 0 aspects in the Not Good (NG) category, out of 18 aspects observed.

Results of Student Activity Observations

The results of observations on student activities in Cycle II, including the initial, core, and closing activities, can be seen in Table 9.

**Table 9.** Percentage of Student Activity Observation Results in Cycle II

Assessment Criteria	Number of Aspects	
	Meeting 3	Meeting 4
Very Good	7 aspect	11 aspect
Good	8 aspect	6 aspect
Fairly Good	3 aspect	1 aspect
Poor	0 aspect	0 aspect
<b>Total</b>	<b>18 aspect</b>	<b>18 aspect</b>

From Table 9, it can be seen that the observation results of student activities using the Discovery Learning model, as observed and assessed in the third meeting, show that 7 aspects were rated as Very Good (VG), 8 aspects as Good (G), 3 aspects as Fairly Good (FG), and 0 aspects as Poor (P). Furthermore, in the fourth meeting, 11 aspects were rated as Very Good (VG), 6 aspects as Good (G), 1 aspect as Fairly Good (FG), and 0 aspects as Poor (P) out of the 18 aspects observed.

#### Student Learning Outcomes

##### a. Affective Domain

**Table 10.** Student Learning Outcomes in the Affective Domain in Cycle II

Assessment Criteria	Assessed Aspects										Average Percentage
	Students	% A1	Students	% A2	Students	% A3	Students	% A4	Students	% A5	
Very Good	7	28%	9	36%	6	24%	9	36%	9	36%	32%
Good	15	60%	10	40%	14	56%	14	56%	12	48%	52%
Fairly Good	3	12%	6	24%	4	16%	2	8%	4	16%	15.2%
Poor	0	0%	0	0%	0	0%	0	0%	0	0%	0%
Total	25	100%	25	100%	25	100%	25	100%	25	100%	100%

Based on Table 10, it is observed that the Good (G) and Very Good (VG) categories for all affective aspects showed an improvement in Cycle II, with an average percentage of 84%, while the Fairly Good (FG) category decreased to 15.2%, and no students fell into the Poor (P) category. All observed aspects have met the established success indicators, namely that at least 80% of students fall into the Good (G) and Very Good (VG) categories.

##### b. Cognitive Domain

**Table 11.** Students' Learning Outcomes in the Affective Domain Cycle II

Score	Number of Students	Percentage (%)	Completeness
< 75	4	16 %	Unmastered.
≥ 75	21	84 %	Mastered
		100 %	

From Table 11, there are 25 students, of whom 21 students (84%) achieved the minimum mastery criterion (KKM), while 4 students (16%) did not, based on the learning test results

presented in Table 4.11. Students who achieved mastery scored between 75 and 100, while those who did not scored below 75, with the lowest score being 53. When the discovery learning model was applied, students' learning outcomes improved; classical mastery reached 84%, surpassing the success criterion of 80%.

c. Psychomotor Domain

**Table 12.** Students' Learning Outcomes in the Psychomotor Domain Cycle II

Assessment Criteria	Assessed Aspect								Average Percentage
	Students	% P1	Students	% P2	Students	% P3	Students	% P4	
Very Good	6	24%	5	20%	7	28%	6	24%	24%
Good	14	56%	15	60%	16	64%	14	56%	59%
Fairly Good	5	20%	5	20%	2	8%	5	20%	17%
Poor	0	0%	0	0%	0	0%	0	0%	0%
Total	25	100%	25	100%	25	100%	25	100%	100%

Based on the table above, there was a significant improvement in students' learning outcomes in the psychomotor domain compared to Cycle I. The average percentage of students achieving the Good and Very Good categories increased to 83%, consisting of 24% Very Good and 59% Good. Meanwhile, only 17% of students were in the Fairly Good category, and no students were in the Poor category. This achievement indicates that the success indicator, which requires at least 80% of students to be in the Good and Very Good categories, has been met. This improvement reflects the success of the instructional enhancements implemented in Cycle II.

**Discussions**

Based on the results of observations on teacher and student activities, as well as the mathematics learning test results obtained in Cycle I, the learning process was still ineffective and had not reached the learning outcome indicators used as a benchmark for success. Learning can be considered effective when it achieves the desired learning objectives in accordance with the achievement indicators (Fakhrurrazi, 2018). Therefore, the researcher continued the study in the next cycle, Cycle II, to obtain the desired results in line with the success indicators.

In Cycle II, there was an improvement in the observed activities of both teachers and students, as well as in mathematics learning outcomes. Regarding the observation of teacher activities in managing the Discovery Learning model, the average aspect scores had already reached the Good and Very Good criteria. Several teacher activity aspects that were rated Fairly Good or Poor in Cycle I were improved in Cycle II and reached the Good (G) category. For instance, in Cycle I, helping students solve or find solutions to problems was an aspect still rated below Good. In Cycle II, it reached the Good category, as students were now actively expressing their knowledge of the material and very actively solving problems. Another aspect in Cycle I involved guiding students to present the results of group discussions, which in Cycle II had been improved to the Good category, positively impacting student activity. Students became active in presenting their group discussion results in front of the class without fear and were confident in asking questions within the group. Another aspect that was still Fairly Good or Poor in Cycle I was delivering the material being studied. This aspect was improved in Cycle II and reached the Good category, influencing students to pay full attention and actively participate during the learning process. Furthermore, motivating students to ask questions or provide opinions to peers during discussions was another aspect rated Fairly Good or Poor in Cycle I.

In Cycle II, it achieved the Good category, with students effectively demonstrating understanding of the teacher's explanations and showing enthusiasm and confidence in responding to their classmates' questions. Thus, every aspect of teacher and student activities improved from Cycle I to Cycle II and met the established success indicators. As a result, students' mathematics learning outcomes in the psychomotor domain increased to 83%, while the cognitive and affective domains increased to 84%.

This also aligns with Rubae'ah's (2021) research, which found that the Discovery Learning model makes learning materials more engaging and the classroom atmosphere more enjoyable for students, ultimately improving student understanding of the material and student grades in evaluations. Furthermore, Rahayu & Hardini (2019) in their research stated that the Discovery Learning method can encourage students to be actively involved in learning, allowing them to understand the material freely, which has an impact on improving student learning outcomes.

Heryati's (2021) research suggests that the application of the Discovery Learning model by teachers can improve student learning outcomes. However, the difference with the research conducted by other researchers lies in the method used, namely expository description. Panjaitan et al., (2020) stated that the use of the Discovery Learning model can improve student learning outcomes. Similar to Heryati's research, this study differs in the research method used, namely a combination of qualitative and quantitative approaches. Then, research by Jannah et al. (2022) that the Discovery Learning learning model is the right choice for training students to think independently and be confident in expressing their opinions and also making learning active. The research method used is R&D/Research and Development.

## CONCLUSION

Based on the research results and discussion described previously, it can be concluded that the implementation of the Discovery Learning model in teaching can improve students' mathematics learning outcomes on the topic of linear equations and inequalities in one variable for class VII-1 at MTs Al-Khairaat Kwandang. This can be demonstrated through: (1) the teacher's ability to manage the Discovery Learning model, which in Cycle I was assessed as Fairly Good (FG) and then improved to Good (G) and Very Good (VG) in Cycle II; (2) student activities in learning using the Discovery Learning model, which in Cycle I were assessed as Fairly Good (FG) and then improved to Good (G) and Very Good (VG) in Cycle II; and (3) the learning mastery achieved in Cycle I, where the cognitive domain reached 40% and increased by 44%, resulting in 84% mastery in Cycle II. For the affective domain, mastery reached 42% and increased by 42%, achieving 84% in Cycle II. Meanwhile, the psychomotor domain reached 45% in Cycle I, increasing by 38% to achieve 83% mastery in Cycle II. Based on the data obtained, it shows that the research in Cycle II was successful because the action's success indicators had been met. Specifically, observations of teacher and student activities indicated that all observed aspects reached at least the Good (G) or Very Good (VG) category, and the learning outcome assessment showed that at least 80% of all students participating in the learning achieved the Minimum Mastery Criterion (KKM) of 75.

## REFERENCES

- Arham, Zakaria, P., Katili, N., & Damayanti, T. (2023). Meningkatkan Hasil Belajar Matematika Siswa Pada Materi Matriks Melalui Penerapan Model Pembelajaran Kooperatif Tipe NHT. *Jambura Journal of Mathematics Education*, 4(2), 148–157.
- Fakhrurrazi, F. (2018). Hakikat pembelajaran yang efektif. *At-Tafkir*, 11(1), 85-99.

- Haryono. 2015. *Bimbingan Teknik Menulis Penelitian Tindakan Kelas (PTK)*. Yogyakarta: Amara Books.
- Heryati, I. (2021). Peningkatan Hasil Belajar Peserta Didik Melalui Penerapan Model Pembelajaran Penemuan (Discovery Learning) Tentang Persamaan Linear Satu Variabel di SMP Negeri 14 Kota Bogor. *Journal of Social Studies, Arts and Humanities (JSSAH)*, 1(01), 06-11.
- Hosnan, M. 2014. *Pendekatan Saintifik dan Kontekstual dalam pembelajaran Abad 21*. Bogor: Ghalia Indonesia.
- Ismail, S., Ismail, Sumarno., Abdullah, A. W., & Majid. (2023). Meningkatkan Hasil Belajar Matematika Siswa Kelas VII-1 MTs Alkhairaat Salilama pada Materi Persamaan dan Pertidaksamaan Linier Satu Variabel dengan Menggunakan Model Pembelajaran Learning Cycle 5E. *JEMS (Jurnal Pendidikan Matematika Dan Sains)*, 11(2), 526–533
- Jannah, A. N., Putri, D. A., & Cahyani, S. A. (2022). Penerapan strategi pembelajaran discovery learning dalam meningkatkan hasil belajar siswa sekolah dasar. *VOX EDUKASI: Jurnal Ilmiah Ilmu Pendidikan*, 13(2), 228-236.
- Jayadiningrat, M. G., Putra, K. A. A., & Putra, P. S. E. A. (2019). Penerapan model pembelajaran discovery learning untuk meningkatkan aktivitas dan hasil belajar siswa. *Jurnal pendidikan kimia Undiksha*, 3(2), 83-89.
- Kurnaisih, Sani. 2014. "Strategi-strategi Pembelajaran". Bandung: Alfabeta.
- Laknasa, D. P. A., Abdullah, A. W., Pauweni, K. A., Usman, K., & Kaluku, A. (2021). Meningkatkan hasil belajar matematika siswa melalui pembelajaran multimedia interaktif dengan model discovery learning. *Euler: Jurnal Ilmiah Matematika, Sains dan Teknologi*, 9(2), 103-108.
- Lasambu, S. R., Zakaria, P., & Oroh, F. A. (2024). Meningkatkan Hasil Belajar Siswa Menggunakan Model Pembelajaran Kooperatif Tipe STAD Berbantuan Media Pembelajaran CERDAS Pada Materi Bangun Ruang Sisi Datar Di Kelas VIII SMP Negeri Daerah Kotabunan. *JEMS: Jurnal Edukasi Matematika dan Sains*, 12(1), 83-94.
- Manoppo, R., Pomalato, S. W. D., Zakiyah, S., & Puloo, M. M. L. (2022). Pengaruh Model Pembelajaran Probing Prompting Terhadap Hasil Belajar Siswa Pada Materi Segiempat. *Jambura Journal of Mathematics Education*, 3(2), 93-99.
- Nursawitri, W., Yuspriyati, D. N., Riajanto, M. L. E. J., Kadarisma, G., & Kresnawan, A. (2023). Peningkatan Hasil Belajar Peserta Didik Smp Pada Materi Persamaan Linear Satu Variabel Dengan Model Discovery Learning. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, 6(2), 743-754
- Pakaya, F., Katili, N., & Majid, M. (2023). Meningkatkan Hasil Belajar Siswa Kelas X SMA Negeri 6 Gorontalo Utara dalam Memecahkan Masalah Matematika Tipe Higher Order Thinking Skills. *JEMS: Jurnal Edukasi Matematika dan Sains*, 11(2), 555-560.
- Panjaitan, W. A., Simarmata, E. J., Sipayung, R., & Silaban, P. J. (2020). Upaya Meningkatkan Hasil Belajar Peserta didik Menggunakan Model Pembelajaran Discovery Learning di Sekolah Dasar. *Jurnal Basicedu*, 4(4), 1350–1357.
- Pauweni, K. A. Y., & Iskandar, M. E. B. (2021). Meningkatkan Kemampuan Pemecahan

Masalah Matematika Melalui Model Problem-Based Learning Pada Materi Bilangan Pecahan. *Euler : Jurnal Ilmiah Matematika, Sains Dan Teknologi*, 8(1), 23–28.

Pauweni, K. A. Y., K. Usman., A. W. Abdullah., Rusidiy. (2021). Deskripsi Pemahaman Konsep Matematika Pada Materi Bangun Sisi Lengkung. *Euler : Jurnal Ilmiah Matematika, Sains Dan Teknologi*, 7(1), 37–44.

Rahayu, I. P., & Hardini, A. T. A. (2019). Penerapan model discovery learning untuk meningkatkan keaktifan dan hasil belajar tematik. *Journal of education action research*, 3(3), 193-200.

Rubae'ah, C. (2021). Peningkatan Hasil Belajar Siswa Melalui Model Pembelajaran Penemuan (Discovery Learning) Pada Materi Persamaan Linear Satu Variabel Kelas 7D SMP Negeri 8 Kota Bogor. *Journal of Social Studies Arts and Humanities (JSSAH)*, 1(1), 51-56.

Uno, Hamzah. (2013). *Mengelola Kecerdasan Dalam Pembelajaran*. Jakarta: PT Bumi Aksara.