

## The Effect of Flipped Classroom Model Integrated with Deep Learning Approach on Students' Mathematical Problem-solving Ability

Desi Trisnawati<sup>1</sup>, Zainnur Wijayanto<sup>2</sup>

Pendidikan Guru Sekolah Dasar, Universitas Sarjanawiyata Tamansiswa<sup>1,2</sup>

---

### Article Information

Reviewed : April 22, 2025

Revised : May 02, 2025

Available Online : July 15, 2025

---

### Keyword

Deep Learning, Flipped Classroom, Mathematical Problem-Solving Ability, Elementary School.

---

### Correspondence E-mail :

[desitri085035@ustjogja.ac.id](mailto:desitri085035@ustjogja.ac.id)

---

### ABSTRACT

The purpose of this study was to determine the effect of Flipped Classroom model integrated with Deep Learning approach on students' mathematical problem-solving ability. This study used a quasi-experimental approach and was quantitative in nature. The study population was 32 students of grade VI of SD Negeri 4 Klaten in the 2024-2025 school year. While the research sample was 16 students of class VI A and 16 students of class VI B. Sampling was done by *total sampling* method. Class VI B as the control group, while class VI A as the experimental group. The research instrument was a written test of the initial version and the final version. Based on the results of the study, the average value of the experimental class in math problem solving was 80.37 while the average value of the control class was 63.37. The research results obtained from hypothesis testing show that the Flipped Classroom model integrated with the Deep Learning approach has an influence on students' ability to solve math problems because the sig. value of  $0.000 < 0.05$ . So H1 is accepted and H0 is rejected, meaning that there is an effect of the Flipped Classroom model integrated with the Deep Learning approach on students' mathematical problem-solving ability.

---

DOI : <https://doi.org/10.22437/gentala.v4i1.xxxxx>

---

## INTRODUCTION

Nowadays, technology is developing very rapidly. Life will run smoothly with scientific advancements due to technology. All innovations are made to have a beneficial impact on human life. It offers new methods of carrying out human tasks in addition to providing a lot of convenience (Al, 2023) . According to Nasser et al., (2021) , the advantages of technology include facilitating human work by anticipating the limitations of human work methods and utilizing technology as an additional source of power.

One of the disciplines that needs to be taught at all levels of education is mathematics. Mathematics is taught from elementary school to college using resources tailored to the cognitive development of students. Murtiyasa (2015 in Nurfadillah et al., 2020) , states that in everyday life and when studying other sciences, mathematics is a branch of science that can be used to communicate, think, and solve various problems.

Solving problems, which involves solving models, building mathematical models, understanding problems, and interpreting results, is one of the objectives of mathematics education in schools, according to Permendiknas Number 22 of 2016. From a curriculum perspective, problem-solving skills are essential to the educational process. In addition to increasing students' intellectual capacity, problem solving skills can motivate them to approach problems methodically. Aljaberi (in Kusnadi & Mardiani, 2022) , asserts that the most important aspect of mathematics is problem solving, which is also one of the most important cognitive skills for everyday life. Therefore, when studying mathematics, students should be able to solve problems because it is necessary to be more careful when dealing with mathematical problems relevant to everyday life (Damianti & Afriansyah, 2022) .

Putra (2018 in Azra, 2024) , revealed that in practice, students' mathematical problem solving skills are still inadequate so there needs to be efforts to improve them. The average percentage results of the four measurements of problem solving ability are as follows: 60% of students made errors at very high criteria on problem solving indicators, 42.86% of students made errors at high criteria on problem solving planning indicators, and 45.72% of students made errors when solving problems and interpreting solutions. Sriwahyuni & Maryati (2022) , also showed that students' mathematical problem solving skills were still low, especially in terms of selecting and using methods to solve mathematical problems, interpreting results based on the original problem, confirming the accuracy of answers or results (62.50%), and using mathematics in a meaningful way.

In the initial observation at SDN 4 Klaten, it was also found that students had difficulty in solving math problems. Students' math test results were relatively low and they had difficulty completing tasks given by the teacher. Most students feel confused in understanding and solving problem solving problems. This is because students are not motivated or interested in participating in math learning, and the learning approach is boring. Thus, a learning paradigm that can increase students' motivation and interest is needed.

Flipped Classroom is one example of a learning model that aims to foster problem-solving skills. In Flipped Classroom, assignments and materials are given in the opposite order. Through the use of technology and internet network facilities, Flipped Classroom learning allows students to watch video lessons, listen to tutorials, or download learning resources on their own at home or other locations (Patandean & Indrajit, 2021) .

The Flipped Classroom model can improve student learning outcomes and self-esteem because it encourages more contact between students and teachers, maximizes student accountability, makes class time more effective, and allows students to learn on their own in exploring online learning resources to encourage motivation and interest in completing as many projects as possible (Fedistia & Musdi, 2020). According to Aristika (in Kurniawan et al., 2020), the desire or interest in mathematics that leads to critical thinking and constructive behaviors, such as empathy, curiosity, perseverance, and confidence in one's own ability to solve problems is known as mathematical disposition. Students must have a mathematical disposition in order to feel more confident and able to seek or find solutions to given problems.

According to Mayasari et al., (2021) a teacher in the future needs to prepare himself and continue to learn in order to keep up with technological developments, especially in the field of curriculum development. An innovation is needed in the form of applying models, approaches, methods, and using learning media to increase learning effectiveness. The application of the *Flipped Learning* model will be more effective if it is integrated with appropriate and innovative learning approaches. One of the learning approaches that can be applied is the Deep Learning approach.

In accordance with the presentation of the Center for Curriculum and Learning (Puskujar) Deep Learning is a learning approach that emphasizes the creation of an atmosphere and learning process that is *mindful, meaningful, and joyful* through thinking, heart, taste, and physical/kinesthetic exercise in a holistic and integrated manner. This approach focuses on a deep understanding of learning concepts and materials to realize the graduate profile, which consists of 8 dimensions, namely: 1) Faith and Devotion to God Almighty, 2) Citizenship, 3) Critical Reasoning, 4) Creativity, 5) Collaboration, 6) Independence, 7) Health, and 8) Communication. This is in line with previous research, that the Deep Learning approach helps students understand the material, improve creative thinking, critical thinking, and problem solving skills (Suwandi et al., 2024).

The principles of the Deep Learning Approach are conscious, meaningful and joyful. The principle of awareness emphasizes the awareness of learners to be active learners and able to self-regulate so that learners can have intrinsic motivation to learn and actively develop learning strategies to achieve goals. The principle of awareness emphasizes the application of knowledge to real situations. Learners are not only limited to understanding information, but

can apply the knowledge in everyday life. The encouraging principle emphasizes the creation of a positive, challenging, fun and motivating learning atmosphere.

Previous research conducted by Rifandi et al., (2022) , claims that students' capacity to solve math problems is influenced by the Flipped Classroom learning approach based on *Attention, Relevance, Confidence, Satisfaction* (ARCS). Meanwhile, in a study conducted by Rahmawati et al., (2020) , showed that the experimental class and the control class had a significant difference in the level of student learning motivation, with a calculated t value of  $1.77 > t_{table} 1.67$  at the 0.05 significance level. It can be said that students' motivation to learn learning materials has a positive impact when the Flipped Classroom learning paradigm is combined with cooperative learning.

In contrast to the previous studies described above, this study focuses on the effect of applying the Flipped Classroom *learning* model integrated with the Deep Learning approach in improving problem solving skills in elementary school students. When combined with the Deep Learning approach, the Flipped Classroom learning model can help students become more proficient in solving math problems. To maximize student potential, improve learning quality, and increase student understanding, the Flipped Classroom approach uses educational videos outside the classroom so that students can learn independently and at their own pace (Khoirotunnisa, 2019 in Mariam et al., 2024) . Then in the classroom students conduct in-depth discussion activities with Deep Learning with the stages of the teacher building student awareness, implementing fun learning, solving problems, and reflecting. The Deep Learning approach combines *mindful, meaningful, and joyful learning* to provide learning that emphasizes character development and a comprehensive learning experience in addition to academic success (Diputera et al., 2024) .

Based on the description above, researchers feel the need to conduct research that has the aim of knowing the effect of the Flipped Classroom model integrated with the Deep Learning approach on students' mathematical problem-solving skills. The title of this research is "The Effect of Flipped Classroom Model Integrated with Deep Learning Approach on Students' Mathematical Problem-Solving Ability". It is hoped that this research will shed light on learning models and approaches that can improve students' ability to solve mathematical problems and become a guide for further research.

## RESEARCH METHODS

### Type of research

This research uses a quantitative approach. Quantitative research is conducted to test the effectiveness of experimental variables (Rustamana, Wahyuningsih, Azka, & Wahyu, 2024). In this study, the quantitative approach was used to test the hypothesis that had been determined.

### Time and Place of Research

This research was conducted at SD Negeri 4 Klaten. This elementary school is one of the schools located in Klaten Tengah District, Klaten Regency. Researchers conducted research on students in grades VI A and VI B of SDN 4 Klaten in semester 1 of the 2024-2025 school year.

### Target/Subject of Research

Grade VI students of SD Negeri 4 Klaten, totaling 32 students, were the population in this study. Meanwhile, 16 students in class VI A and 16 students in class VI B became the research sample. Total sampling was used as a sampling strategy in this study. Total sampling / census is a sampling technique that uses all members of the population as samples (Sugiyono, 2022). Class VI B served as the control group, while Class VI A was the experimental group.

### Procedure

This research uses experimental research. Sugiyono (2019) defines the experimental research method as a quantitative approach conducted through an experiment to determine the effect of independent variables (treatment) on the dependent variable (outcome) under controlled conditions. Researchers used an experimental approach because of the need to see *pretest* and *posttest* results on the form of learning provided. This study aims to validate the theory of how students' mathematical problem solving skills are affected by the Flipped Classroom model integrated with the Deep Learning approach. The methodology for this research is quasi-experimental.

### Data, Instruments, and Data Collection Techniques

Students' scores on math problem solving skills became part of the research data. The math problem solving skills test with descriptive questions arranged according to the test grid acts as a research instrument. The test instrument is in the form of problem solving questions consisting of 10 description questions. The scoring guidelines made refer to the indicators of

mathematical problem solving. Scoring guidelines in mathematical problem solving questions are as follows:

**Table 1. Scoring Guidelines for Mathematical Problem Solving Problems**

Indicators	Score
Students understand the problem in the problem	1
Students understand the problems in the problem and write a problem solving plan	2
Students understand the problem, write a problem solving plan, and implement the problem solving plan.	3
Students understand the problem in the problem, write a problem solving plan, implement the problem solving plan, and recheck the correctness of the problem solving.	4

With the help of SPSS software, Independent T-Test was used as a data analysis method in this study, where the experimental and control groups were given an initial test and a final test.

## RESEARCH RESULTS AND DISCUSSION

### Results

This study aims to examine the effect of Flipped Classroom model integrated with Deep Learning approach on students' mathematical problem-solving ability. Researchers have tested 32 students who are in different classes, namely 16 experimental class students and 16 control class students. The stage carried out by the researcher is by sending a learning video on the material "Converting fractions into decimal form, Comparing and Sorting Decimal Numbers" in the *WhatsApp* group. The material was studied first by students at home, then discussed further in class the next day. In class, learning is carried out with questions and answers related to the content of the material contained in the video. After that, the teacher builds students' self-awareness regarding the importance of the material learned (*Mindful Learning*). The next stage is students working in groups to solve math problems on the Learner Worksheet (LKPD).

In creating *joyful learning*, the researcher used the game "Finding Treasure" by giving fraction cards and asking students to find the fraction in decimal form. After that, students worked on evaluation questions and continued with reinforcement. At the end of the class, students are invited to reflect on the learning that has been done and its benefits. Students are also given follow-up homework related to the application of learning materials in everyday life (*Meaningful Learning*).

**Table 2. Normality Test**

	Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk			
	Statistic	Df	Sig.	Statistic	df	Sig.	
Problem Solving Ability	.132	32	.172	.971	32	.537	

a. Lilliefors Significance Correction

The normality value shows that the data of Flipped Classroom model integrated with Deep Learning approach and problem-solving ability are normally distributed. This can be seen from the sig. value.  $0.537 > 0.05$ .

**Table 3. Mean Test**

	Group Statistics				
	Group	N	Mean	Std. Deviation	Std. Error Mean
Problem Solving Ability	Experiment	16	80.3750	7.46436	1.86609
	Control	16	63.3750	8.98053	2.24513

The mean result for the experimental group was 80.37 with a standard deviation value of 7.46. As for the control group, the mean value was 63.37 with a standard deviation value of 8.9.

**Table 4. Independent Samples Test**

		Independent Samples Test								
		Levene's Test for Equality of Variances				t-test for Equality of Means				
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Problem Solving Ability	Equal variances assumed	.861	.361	5.823	30	.000	17.000	2.91940	11.03778	22.96222
	Equal variances not assumed			5.823	29.0	.000	17.000	2.91940	11.02941	22.97059

The test results show that the sig. value obtained is  $0.000 < 0.05$ . In this case, it can be said that the Flipped Classroom model integrated with the Deep Learning approach has an influence on problem solving skills. The results of this study are in line with Rifandi et al., (2022) which reveals that Flipped Classroom can be used as a learning model to be able to influence problem solving skills. Every human being has a need to acquire learning. In this

situation, appropriate teaching strategies are needed to help students develop problem-solving skills. Humans live life following the developments in the world. One of them is the presence of technology that provides new changes in human life. The emergence of technology makes it difficult for some individuals to have the ability to solve problems. One of the problems in education is low critical thinking skills (Adriani & Mulyani, 2023).

## Discussion

Mathematics is a subject that must be taught to students. This is because math is related to the ability to think critically. Learning math makes students learn to solve solutions. According to Murtiyasa (2015 in Nurfadillah et al., 2020), mathematics is used as a branch of knowledge to think, communicate and solve problems. In this case, learning mathematics is a way for humans to be able to take the opportunity to learn and solve problems. Some students who are less able to explore learning mathematics will find it difficult to be able to think critically. In this condition, Flipped Classroom is used as an example of a learning model that can help students to gain learning and solving. In this situation, students will be given materials and assignments to assess students' perspectives.

Flipped Classroom is a teaching model by utilizing videos or e-books to prepare for learning in the classroom (Adriani & Mulyani, 2023). The presence of Flipped Classroom makes it easier for students to be able to download their own learning resources, watch lessons quietly and listen to tutorials according to their needs (Patandean & Indrajit, 2021). According to Fedistia & Musdi (2020), the Flipped Classroom model is able to increase students' ability to learn and increase self-confidence. This is because the class can be formed more productively and students can learn independently. In this learning, students are more free to express their views and show responsibility to be able to increase motivation in learning.

Flipped Classroom is one of the innovative approaches used in modern education. This model has shifted the role of the classroom from a learning space to an interactive discussion arena. The application of the Flipped Classroom model is able to provide learning encouragement to students, especially to improve the ability of self-regulated learning by students. With this, students' ability for proactive participation is seen. Nevertheless, the role of the teacher is very important in teaching and utilizing digital media (Yusuf, 2025).

Success in education is influenced by the success of learning activities carried out in the classroom (Adriani & Mulyani, 2023). Restiana et al. (2023) showed that the advantage of

Flipped Classroom learning is that students can learn in comfortable conditions where this will make thinking more critical. An educator should be able to understand technological changes and how they are applied in learning. Not only that, the ability of teachers to adapt to environmental conditions is also needed due to technological shifts.

Deep Learning is a learning approach that involves deep understanding, logical and clear reasoning, and application of knowledge in practical situations (Mutmainnah et al., 2025) . This approach is based on three elements namely *Meaningful Learning*, *Mindful Learning*, and *Joyful Learning*. *Meaningful Learning* is meaningful learning, which allows students to understand information in a more thorough and in-depth way. During this procedure, students' prior knowledge is combined with current information. *Mindful Learning* contributes significantly to raising students' awareness and encouraging their active participation in the educational process. Here, mindfulness aims to develop mentality by modeling openness to new experiences, critical thinking about preconceptions and ideas, and readiness to learn. Students are encouraged to develop into thoughtful and conscientious learners with this method. *Joyful Learning* adds a significant emotional component to the educational process. This method combines the elements of joyful learning, efficacy, creativity, and action. Creating a joyful learning environment increases the effectiveness of learning rather than decreasing its content. Students can become more intrinsically motivated and willing to face academic challenges in a positive and supportive learning atmosphere (Mutmainnah et al., 2025) . Students tend to participate more actively and feel more confident about their understanding of the subject matter when learning is made fun (Mubaroq, 2025).

According to research by Jiang (2022) , students who follow learning with Deep Learning approach usually show better understanding, more encouragement and better application of knowledge. *The Deep Learning* approach prioritizes the development of critical thinking, creative, and problem-solving skills to education aims to improve students' readiness to face the complexity of today's world with rapid technological advances. The Deep Learning approach places a strong emphasis on a learning process that includes critical analysis, application of knowledge in a broader context, and connecting new data to what is already known. Creating meaningful, fun, critical and more reflective learning is the goal. According to research by Biggs & Tang (2022) , *the Deep Learning* approach has been used in several

countries, showing progress and relevant results in improving the level of student engagement and quality of understanding.

Flipped Classroom learning integrated with Deep Learning shows deeper learning to improve problem-solving skills. Deep Learning is carried out by involving the role of the teacher in order to form student awareness in showing learning motivation. If students have high motivation to learn, the ability to solve math problems will also increase. In a learning process, students' ability to solve math problems is formed because they are motivated by the teaching done by the teacher (Diputera et al., 2024).

## CONCLUSIONS AND IMPLICATIONS

### Conclusion

This study concludes that the Flipped Classroom model combined with the Deep Learning approach has an influence on the mathematical problem solving skills of SD Negeri 4 Klaten students based on the results of the research and discussion previously described. This is evident from the sig value obtained which is  $0.000 < 0.05$ .

### Implications

The results of this study provide some important implications in the context of mathematics learning in elementary schools, especially in the development of innovative learning methods and approaches that are relevant to the needs of students in the digital era.

1. The application of the Flipped Classroom model integrated with the Deep Learning approach is proven to significantly improve students' mathematical problem-solving skills. Therefore, mathematics teachers at the elementary school level can consider this model as a strategic alternative to overcome students' low ability to solve problem-based problems. Learning that moves the delivery of material outside the classroom through digital media allows students to learn at their own pace, so that face-to-face time can be utilized to deepen concepts through meaningful discussion and practice.
2. The Deep Learning approach that emphasizes *mindful*, *meaningful* and *joyful* learning contributes to increasing students' learning motivation. In the long run, the application of these learning principles not only promotes academic achievement, but also shapes students' critical, independent and reflective characters. Therefore, schools and education policy makers need to support curriculum development and teacher training that integrates this approach.

3. The results of this study can serve as a reference in the development of teacher training programs that emphasize the integration of learning technology and active pedagogy strategies. Teachers need to be equipped with competencies in developing digital learning content, as well as skills to guide deep discussions in the classroom. Support in the form of technical and pedagogical training will strengthen the implementation of the Flipped Classroom-Deep Learning model widely and sustainably.
4. The success of this model also shows the importance of continuous innovation in the basic education system. Schools need to open space for experimentation of learning models that are adaptive to technological developments and 21st century needs. The implementation of the Flipped Classroom model with a Deep Learning approach can be part of a strategy to improve the quality of competency and character-based education.

## REFERENCES

- Adriani, D., & Mulyani, A. (2023). Peran Guru Dalam Penerapan Model Flipped Classroom Berbasis Tpack Untuk Meningkatkan Kemampuan Berfikir Kritis Pada Siswa Sekolah Menengah. *Jurnal Masalahah*, 4(1), 30–45.
- Al, M. D. B. (2023). Kemajuan Teknologi Dan Pola Hidup Manusia Dalam Perspektif Sosial Budaya. *TUTURAN: Jurnal Ilmu Komunikasi, Sosial Dan Humaniora*, 1(3), 274–301.
- Azra, M. J. (2024). *Pengaruh Model Pembelajaran Flipped Classroom terhadap Kemampuan Pemecahan Masalah Matematis Siswa Ditinjau Berdasarkan Self Efficacy*. Universitas Islam Negeri Sultan Syarif Kasim Riau.
- Biggs, J., & Tang, C. (2022). *Teaching for quality learning at university* (Fifth Edit). Maidenhead : Open University Press.
- Damianti, D., & Afriansyah, E. A. (2022). Analisis Kemampuan Pemecahan Masalah Matematis Dan Self-Efficacy Siswa SMP. *INSPIRAMATIKA: Jurnal Inovasi Pendidikan Dan Pembelajaran Matematika*, 8(1).
- Diputera, A. M., Zulpan, & Eza, G. N. (2024). Memahami Konsep Pendekatan Deep Learning dalam Pembelajaran Anak Usia Dini Yang Meaningful, Mindful dan Joyful: Kajian Melalui Filsafat Pendidikan. *Bunga Rampai Usia Emas (BRUE)*, 10(2), 108–120.
- Fedistia, R., & Musdi, E. (2020). Efektivitas Perangkat Pembelajaran Berbasis Flipped Classroom untuk Meningkatkan Kemampuan Penalaran Matematis Peserta Didik. *Jurnal Didaktik Matematika*, 7(1), 45–59. <https://doi.org/10.24815/jdm.v7i1.14371>
- Jiang, R. (2022). Understanding, Investigating, and promoting deep learning in language education: A survey on chinese college students' deep learning in the online EFL teaching context. *Frontiers in Psychology*, 13. <https://doi.org/https://doi.org/10.3389/fpsyg.2022.955565>
- Kurniawan, H., Pardimin, & Wijayanto, Z. (2020). Eksperimentasi Model Pembelajaran

- Flipped Classroom Ditinjau dari Disposisi Matematis Siswa. *UNION: Jurnal Pendidikan Matematika Volume*, 8(1), 97–109.
- Kusnadi, R. M., & Mardiani, D. (2022). Kemampuan Pemecahan Masalah Matematis Siswa Sekolah Menengah Pertama Negeri 3 Tarogong Kidul Dalam Masalah Statistika. *Jurnal Inovasi Pembelajaran Matematika: PowerMathEdu (PME)*, 01(02), 173–182.
- Mariam, M., Sandiva, A. S., & Putra, S. (2024). Penerapan Metode Flipped Classroom Dalam Kemandirian Belajar Peserta Didik. *Jurnal Review Pendidikan Dan Pengajaran*, 7(4), 14721–14728.
- Mayasari, A., Supriani, Y., & Arifudin, O. (2021). Implementasi Sistem Informasi Manajemen Akademik Berbasis Teknologi Informasi dalam Meningkatkan Mutu Pelayanan Pembelajaran di SMK. *JIP-Jurnal Ilmiah Ilmu Pendidikan*, 4(5), 340–345.
- Mubarok, M. M. (2025). Joyful Learning Sebagai Pendekatan Humanis Dalam Pendidikan Agama Islam. *Sasana: Jurnal Pendidikan Agama Islam*, 3(2), 177–184. <https://doi.org/10.56854/sasana.v3i2.455>
- Mutmainnah, N., Adrias, A., & Zulkarnaini, A. P. (2025). Implementasi Pendekatan Deep Learning Terhadap pembelajaran Matematika Di Sekolah Dasar. *Pendas : Jurnal Ilmiah Pendidikan Dasar*, 10(1).
- Nasser, A. A., Arifudin, O., Barlian, U. C., & Saur, S. (2021). Sistem Penerimaan Siswa Baru Berbasis Web Dalam Meningkatkan Mutu Siswa Di Era Pandemi. *Biomatika: Jurnal Ilmiah Fakultas Keguruan Dan Ilmu Pendidikan*, 7(1), 100–109.
- Nurfadillah, L., Santosa, C. A. H. F., & Novaliyosi. (2020). Pengaruh Model Pembelajaran Flipped Classroom Terhadap Kemampuan Berpikir Kritis Matematis Siswa. *WILANGAN: Jurnal Inovasi Dan Riset Pendidikan Matematika*, X(X).
- Patandean, Y. R., & Indrajit, R. E. (2021). *Flipped Classroom*. Yogyakarta: ANDI.
- Rahmawati, R. A., Muhab, S., & Hadinugrahaningsih, T. (2020). Pengaruh Model Pembelajaran Flipped Classroom terintegrasi Cooperative Learning Terhadap Motivasi Siswa pada Materi Pelajaran Reaksi Reduksi dan Oksidasi. *Jurnal Riset Pendidikan Kimia*, 10(2), 64–68.
- Restiana, R., Barlian, U. C., Nurjanah, S., Suminar, W., & Cepi Barlian, U. (2023). Studies Model Flipped Classroom Dalam Menumbuhkan Kemandirian Belajar Siswa SD Ibnu Sina. *AL-AFKAR: Journal for Islamic*, 6(2), 648–658. <https://doi.org/10.31943/afkarjournal.v6i2.650>
- Rustamana, A., Wahyuningsih, P., Azka, M. F., & Wahyu, P. (2024). Penelitian Metode Kuantitatif. *Sindoro Cendikia Pendidikan*, 5(6), 1–10.
- Rifandi, A. F., Netriwati, Wawan, G., & Nendra, F. (2022). Pengaruh Model Pembelajaran Flipped Classroom Berbasis Attention, Relevance, Confidence, Satisfaction Terhadap Kemampuan Pemecahan Masalah Matematika Siswa. *Jurnal Pendidikan Matematika*, 13(2), 201–212.
- Sriwahyuni, K., & Maryati, I. (2022). Kemampuan Pemecahan Masalah Matematis Siswa Pada Materi Statistika. *Plusminus: Jurnal Pendidikan Matematika*, 2(2).
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Alfabeta.

- Sugiyono, S. (2022). *Metode penelitian kuantitatif* (Cetakan Ti). Alfabeta.
- Suwandi, Putri, R., & Sulastri. (2024). Inovasi Pendidikan dengan Menggunakan Model Deep Learning di Indonesia. *Jurnal Pendidikan Kewarganegaraan Dan Politik (JPKP)*, 2(2), 69–77.
- Yusuf, M. (2025). Flipped Classroom : Partisipasi Siswa Revolusi Pengajaran dalam Meningkatkan. *Academicus: Journal of Teaching and Learning*, 4(1), 27–44. <https://doi.org/10.59373/academicus.v4i1.80>