

IMPROVING THE MATHEMATICS LEARNING PROCESS AND OUTCOMES USING THE NHT MODEL BASED ON UNO CARD MEDIA IN CLASS V OF SDN 81/II MUARA BUNGO

Azka Ulhaq Shetarro¹, Randi Eka Putra², Elvima Nofrianni³

Universitas Muhammadiyah Muara Bungo, Bungo, Indonesia

e-mail: azkaulhq@gmail.com

Abstract

This research is motivated by the low mathematics learning process and outcomes at SDN 81/II Muara Bungo due to the dominance of conventional learning and limited media. This Classroom Action Research (CAR) aims to improve the quality of learning through the Numbered Heads Together (NHT) cooperative model based on UNO cards. Implemented in two cycles with the stages of planning, action, observation, and reflection, the study involved 28 fifth grade students. The results show that the integration of UNO cards in the NHT syntax creates a positive interactive and competitive learning atmosphere. A significant increase is seen from the classical completion rate which increased from 57% in Cycle I to 86% in Cycle II, exceeding the target indicator of 80%. It is concluded that the UNO card-based NHT model is effective in improving the mathematics learning process and outcomes.

Keywords: Mathematics Learning Outcomes, NHT, UNO.

Abstrak

Penelitian ini dilatarbelakangi oleh rendahnya proses dan hasil belajar matematika di SDN 81/II Muara Bungo akibat dominasi pembelajaran konvensional dan keterbatasan media. Penelitian Tindakan Kelas (PTK) ini bertujuan meningkatkan kualitas pembelajaran melalui model kooperatif *Numbered Heads Together* (NHT) berbasis kartu UNO. Dilaksanakan dalam dua siklus dengan tahapan perencanaan, tindakan, observasi, dan refleksi, penelitian melibatkan 28 siswa kelas V. Hasil menunjukkan integrasi kartu UNO dalam sintaks NHT menciptakan suasana belajar interaktif dan kompetitif yang positif. Peningkatan signifikan terlihat dari tingkat ketuntasan klasikal yang meningkat dari 57% pada Siklus I menjadi 86% pada Siklus II, melampaui target indikator 80%. Disimpulkan bahwa model NHT berbasis kartu UNO efektif meningkatkan proses dan hasil belajar matematika.

Kata Kunci: Hasil Belajar Matematika, NHT, UNO.

INTRODUCTION

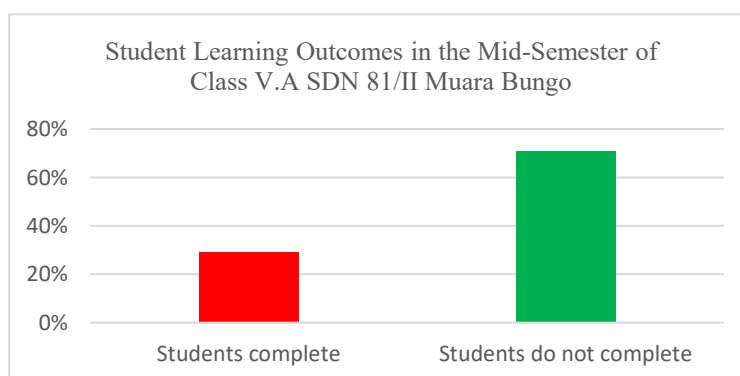
The ability to solve mathematical problems is a crucial foundation for students to deepen their knowledge of this discipline (Rahayuningsih et al., 2024). Beyond simply memorizing formulas, students are required to integrate theoretical understanding into the practical contexts they encounter every day. In line with Polya's view, this activity is a central element in mathematics education, honing critical reasoning, from the analytical stage to creative solution (Wulantina et al., 2023). Ironically, student performance in Indonesia remains concerning. PISA 2022 data shows that Indonesia's mathematical literacy score only reached 366, far below the OECD average (OECD, 2023). This gap indicates that students' ability to transform mathematical theory into real-world scenarios is still very limited (Simamora et al., 2023).

In mathematics learning, problem-solving is a key competency that determines student learning success (Nursalam et al., 2023). This process requires students to go beyond textual understanding to apply mathematical logic to real-world situations. Citing Polya's theory, problem-solving is seen as the heart of learning, triggering higher-order thinking skills (Indrawati et al., 2022). However, the reality on the ground shows significant challenges; Indonesia ranked low (72nd out of 79 countries) in the latest PISA report, with scores stagnating below the global average (OECD, 2023). This low achievement reflects students' difficulty in connecting mathematical abstractions to real-world challenges (Sudarman et al., 2024).

Mathematics education at the elementary school level is a crucial foundation for developing students' logic, reasoning, and problem-solving skills. At this level, students are expected to not only be able to calculate procedurally but also to understand concepts meaningfully for application in everyday life. However, the reality on the ground shows that mathematics is still considered a difficult, boring, and intimidating subject for most students, including the fifth-grade students of SDN 81/II Muara Bungo.

Based on initial observations, the low mathematics learning process and outcomes are caused by several factors. First, the learning process is still dominated by a conventional, teacher-centered approach, where students tend to passively listen to lectures and work on exercises individually. Second, the lack of positive interaction between students in understanding the material, causing lower-ability students to feel left behind and lack confidence. Third, the learning media used is still limited to textbooks, which are less able to visualize mathematical concepts in an engaging and interactive manner.

In relation to this, the following researcher displays the learning outcomes of students in the mid-semester of class V.A SDN 81/II Muara Bungo in the following table



Based on the mid-semester results of class V.A. SDN 81/II Muara Bungo, it shows that many students' mathematics learning outcomes are still below the Learning Objective Achievement Criteria (KKTP). Of the 28 students, only 8 (29%) passed the KKTP, while 20 (71%) students did not achieve the KKTP. The KKTP at SDN 81/II Muara Bungo is 70. The large number of students who have not achieved the KKTP is due to several issues such as the implementation of unengaging learning models, facilities and infrastructure, and various other issues.

This condition aligns with the need for innovation in learning models that align with the principles of Freedom to Learn, which emphasize independence, collaboration, and enjoyable learning. The Numbered Heads Together (NHT) cooperative learning model offers a structure that forces each student to be responsible for their group assignments through a numbering system. This encourages the active involvement of every individual without exception. However, the implementation of NHT alone is considered insufficient to stimulate student enthusiasm without the presence of recreational supporting media.

Innovation in the form of using UNO Card Media which is modified to become a mathematics learning media is expected to be a bridge to increase motivation. Through the game elements (gamification) in UNO cards, students can practice math problems in a competitive but fun atmosphere. The integration between the NHT model and UNO card media creates a synergy between teamwork and the joy of learning, which in the end is predicted to significantly improve the quality of the learning process and students' cognitive learning outcomes.

Thus, research is needed to determine the extent of the effectiveness of improving mathematics learning processes and outcomes using the NHT model based on UNO card media in class V at SDN 81/II Muara Bungo. This research is considered important because it can provide an overview of alternative learning solutions that are more innovative and can be implemented by teachers in teaching and learning activities, so the author was motivated to conduct research, with the title "Improving Mathematics Learning Processes and

Outcomes Using the NHT Model Based on UNO Card Media in Class V SDN 81/II Muara Bungo".

METHODS

Conceptually, CAR is an integration of three main elements: research, action, and class. Research is defined as the activity of in-depth observation of an object using scientific methodology to collect data useful for improving the quality of the subject being studied. Action refers to interventions or activities deliberately designed with a specific goal, which in this context is realized through a series of activity cycles. Meanwhile, a class is defined as a learning ecosystem consisting of a group of students receiving similar instructions from an educator simultaneously (Asri & Nurhayati, 2022).

The research design used in this scheme refers to the Kemmis and McTaggart model (Pradana & Syarifuddin, 2024). This model was chosen because of its systematic and continuous research flow, which broadly includes the following stages:

1. Planning.
2. Carrying out actions.
3. Observing.
4. Conducting reflection/analysis.

This classroom action research was conducted on February 23, 2026 to March 5, 2026 in the class of SDN 81/II Muara Bungo, Pasar Muara Bungo District, Bungo Regency on the subject of learning Addition and Subtraction of Fractions for fifth grade students with a total of 28 students, 14 boys and 14 girls. The implementation activities of this research consist of the stages of learning implementation, namely planning, implementation, observation, and reflection stages. The research data will be collected using observation, learning outcome tests, and documentation.

Observations were conducted to monitor student learning behavior, teacher teaching activities, student participation, and the effectiveness of the use of teaching aids during learning activities to directly understand student attitudes and abilities. To strengthen the observation findings, a learning outcome test was used in the form of a written instrument consisting of 10 multiple-choice questions given at the end of each cycle to systematically measure material mastery. In line with the views of Putra et al. (2023), this test was designed

as an evaluation instrument to measure individual and group skills and knowledge. The entire process was supported by visual documentation in the form of photos and videos taken during the implementation of the Numbered Heads Together learning model using UNO cards as supporting data for the research results.

Instrument validity is carried out through expert judgment techniques by consulting the test items with the class teacher as a collaborator (observer) to ensure the suitability of the questions with the competency achievement indicators and Data Reliability is carried out by maintaining the consistency or reliability of observation data through collaborative observations between researchers and observers during the teaching and learning process to minimize subjectivity.

The success indicator in this classroom action research is an improvement in the learning process and outcomes of students in mathematics in each cycle. This research sets high standards of success to ensure the quality of learning outcomes:

1. The Learning Process is declared successful if learning activities achieve indicators of $\geq 90\%$. This target was set to ensure that the syntax of the NHT model and the use of UNO cards have been fully implemented in the classroom.
2. The Learning Outcomes are declared successful if the classical mastery level of students reaches $\geq 80\%$ (at least 22 out of 28 students) with a score of $\geq 70\%$ according to the Learning Objective Achievement Criteria (KKTP) applicable at SDN 81/II Muara Bungo. The justification for the 80% target is based on efforts to exceed the initial condition, where the pass rate was only 29%.

Data analysis was conducted in an integrated manner using qualitative and quantitative approaches. Qualitative analysis was used to process data from observations of teacher and student activities through data reduction, systematic data presentation, and drawing conclusions. Quantitative analysis used descriptive statistics to measure the level of student learning achievement. The percentage of achievement was calculated using the formula:

$$P = \frac{F}{N} \times 100 \%$$

Information

P = Percentage sought (relative frequency).

F = Frequency (score obtained).

$N = \text{Number of cases (sum of maximum scores/total individuals)}$.

RESULTS AND DISCUSSION

After all action plans were finalized and the research instruments were declared valid, the next stage was implementing the actions in classroom teaching and learning activities. Each action cycle was followed simultaneously by an observation phase to document classroom dynamics. The data obtained was then described, analyzed, and reflected upon to identify the strengths and weaknesses of the interventions (Prasetyo & Azizah, 2023).

Findings emerging during the process, particularly those related to the research problem indicators, were collected as primary data for formulating conclusions. This research was designed in two continuous cycles, each encompassing four essential stages: planning, acting, observing, and reflecting (Sari et al., 2024). The primary focus of this action plan was optimizing mathematics learning through the implementation of the Numbered Heads Together (NHT) Model supported by UNO Cards to improve student engagement and learning outcomes (Wahyuni & Saputra, 2022).

Based on the results of data analysis in Cycle I, the achievement of the classical average value only reached 57%. This result indicates that the success indicator has not been achieved because it is still below the minimum completeness target set at 80%. Therefore, corrective steps and in-depth evaluation are needed to be implemented in the implementation of Cycle II. The improvement plan for the learning process in Cycle II is focused on two main aspects, namely: Teacher Managerial Improvement, Although teacher performance in teaching and learning activities has begun to show improvement, the aspect of firmness in guiding and directing students still needs to be strengthened. This aims to ensure that the classroom atmosphere remains conducive and focused during the material transformation process and Optimization of Material Delivery by means of Teachers will improve the way of explaining material that is considered difficult by students by using more communicative, simple language, and delivered systematically (coherently) so that it is easier for students to absorb.

The module in cycle II is almost the same as cycle I, but in the learning stage, it is emphasized to students to be more active both in the learning process and the use of the Numbered Heads Together (NHT) Model assisted by UNO Card Media. The use of the Numbered Heads Together (NHT) Model assisted by UNO Card Media has been running well, this is evidenced by the value obtained by students has increased, namely 86%.

Learning success is influenced by the synergy of various factors, ranging from student motivation and interest to teacher creative innovation in managing the class and the use of relevant learning media. Based on data analysis in Cycle II, it is clear that the integration of the Numbered Heads Together (NHT) Model in collaboration with UNO Card Media has been very effective. The implementation of this NHT type of cooperative model has been proven to be able to generate enthusiasm and active involvement of students. The use of UNO Card Media as a group discussion tool makes mathematics material more concrete, enjoyable, and easy to remember in the long term (long-term memory). As a result, students' ability to understand and apply material concepts has increased significantly, as evidenced by the achievement of learning outcomes that are much higher than in Cycle I. The results of the study in Cycle II confirmed that the use of the NHT Model assisted by UNO Card Media has achieved the established success indicators. Thus, the researcher concluded that this intervention has succeeded in improving mathematics learning outcomes of students in grade V of SD Negeri 81/II Muara Bungo, Pasar Muara Bungo District, Bungo Regency.

Cycle I

The learning implementation in Cycle I was carried out systematically referring to the prepared design, which was divided into two meetings with a time allocation of 4 X 35 minutes. The learning process was carried out by implementing the Numbered Heads Together (NHT) Model steps integrated with the use of UNO Card Media as a means of numbering and reinforcing mathematical concepts for students. At the end of the cycle, the researcher conducted a collaborative reflection with the class teacher as an observer. This reflection stage was crucial for objectively analyzing field findings, which included an evaluation of the accuracy of the planning, the effectiveness of the implementation of NHT syntax, as well as the validity of the evaluation instruments and student learning outcomes. Discussions with observers focused on developing improvement strategies to optimize the use of UNO Card media in the next cycle. Based on the results of observations of learning behavior and formative test data, the learning objectives set in Cycle I had not yet achieved the desired success indicator targets. Details of the data obtained can be seen in the table below:

Table 1. Learning Test Results in Cycle I

No	Uraian	Keterangan
1	Total Number of Students	28 Students
2	Number of Students Who Took the Test	28 Students
3	Average Student Score	66.8
4	Number of Students Who Completed the Test	16 Students
5	Number of Students Who Did Not Complete the Test	12 Students
6	Learning Completion (%)	57%

Based on table 1 above, it is known that the Implementation of the Numbered Heads Together (NHT) Model Assisted by Uno Card Media has not been able to meet the set completion targets. Of the 28 students, only 16 students reached the KKTP or 57%, while 43% have not reached the set KKTP. Thus, the use of the Uno card media with the NHT method can be planned with the steps of the learning process that will be implemented in cycle II. Thus, the improvement plan is targeted at the obstacles encountered in cycle I and will be implemented in cycle II.

The learning implementation in Cycle II was carried out systematically, referring to the pre-developed plan, divided into two meetings, each 4 x 35 minutes each. The learning process was carried out by implementing the Numbered Heads Together (NHT) Model steps, integrated with the use of UNO Cards as a means of numbering and reinforcing mathematical concepts for students. At the end of the cycle, the researcher conducted a collaborative reflection with the class teacher as observer. This reflection stage was crucial for objectively analyzing field findings, including evaluating the accuracy of the planning, the effectiveness of the NHT syntax implementation, the validity of the evaluation instruments, and student learning outcomes. Discussions with the observer focused on developing improvement strategies to optimize the use of UNO Cards in the next cycle. Based on observations of learning behavior and formative test data, the learning objectives set in Cycle I did not achieve the desired success indicators.

Based on data analysis in Cycle II, the implementation of the Numbered Heads Together (NHT) Model with the UNO Cards was declared successful, with a very good achievement criterion. This success encompassed all dimensions of the research, from thorough planning, consistent implementation of the model syntax, objective process evaluation, and optimal learning outcomes. Reflection activities were conducted collaboratively between the researcher and the classroom teacher (observer) at the end of each meeting to thoroughly

analyze the findings and field observations. Reflection in Cycle II included a comprehensive evaluation of the effectiveness of the planning, the smooth implementation of the NHT cooperative model in engaging students, and the appropriateness of the use of UNO cards to support the evaluation of student learning outcomes.

However, greater emphasis was placed on systematic implementation and ensuring that the steps of the activities were carried out in accordance with the plan. The results of the Cycle II test showed that student responses were in line with expectations. More details can be seen in Table 2 below:

Table 2. Learning Test Results in Cycle II

No	Uraian	Keterangan
1	Total Number of Students	28 Students
2	Number of Students Who Took the Test	28 Students
3	Average Student Score	85,90
4	Number of Students Who Completed the Test	24 Students
5	Number of Students Who Did Not Complete the Test	4 Students
6	Learning Completion (%)	86%

Based on table 2, it is known that the implementation of the Numbered Heads Together (NHT) Model assisted by UNO Card Media can improve the learning process so that students get an average score of 85.90 with learning completion of 86%.

The significant improvement in student learning outcomes from cycle I (57%) to cycle II (86%) demonstrates the effectiveness of the synergy between the Numbered Heads Together (NHT) model and UNO cards in solving the bottlenecks of conventional learning. This success is analytically attributed to three main factors:

1. **Increased Individual Accountability:** The numbering structure in NHT forces each student to be ready to represent their group. This eliminates the "free rider" phenomenon in group work, where each individual feels morally responsible for understanding the material for their group's score.
2. **Gamification through UNO Cards:** The use of UNO cards as a discussion tool transforms students' perception of mathematics from being intimidating to being enjoyable. The

positive competitive element in this card game stimulates adrenaline and focus, thus maintaining student concentration for longer.

3. Concrete Concept Visualization: The cards help students visualize abstract addition and subtraction operations of fractions in a more concrete way.

These findings reinforce Constructivist Learning Theory, where knowledge is not passively imparted by teachers but constructed by students through social interactions within groups. This aligns with Polya's view that problem-solving is the heart of learning, stimulating higher-order thinking.

Empirically, these research findings support a study by Wahyuni & Saputra (2022), which found that integrating card games into a cooperative learning model significantly increased students' enthusiasm and long-term memory for mathematical concepts. The increase in mastery, exceeding the 80% performance indicator, also confirmed the effectiveness of the Kemmis and McTaggart model in providing a systematic improvement pathway through rigorous reflection.

Despite achieving the target indicators of success, the researchers recognized several limitations in implementing this intervention:

1. Time Management: The use of game media such as UNO cards requires a very strict time allocation. If not managed properly by the teacher as facilitator, the game phase risks dominating time that should be used for concept reinforcement.
2. Classroom Conduciveness: The high enthusiasm during the use of UNO cards sometimes triggers noise that can disrupt the concentration of other classes, requiring firm managerial skills from the teacher to maintain order.
3. Material Generalization: The effectiveness of this media in this cycle was limited to fractions. More complex card modifications are required if it is to be applied to other mathematics materials with a higher level of abstraction.

CONCLUSION

The lesson plan was developed and implemented in accordance with the Numbered Heads Together (NHT) model syntax integrated with UNO Cards. The use of this NHT cooperative model, supported by the appeal of UNO Cards, has been proven to encourage

students to actively participate, express their opinions, and take responsibility for their group assignments. This creates a more memorable, positively competitive, and meaningful learning environment for students. The knowledge construction process is carried out through meaningful activities, where students exchange ideas within groups based on their numbers (UNO cards). The teacher acts as a facilitator, stimulating students' curiosity so that their understanding of mathematical concepts is firmly stored in long-term memory. The effectiveness of the NHT model, supported by UNO Cards, is clearly evident in the significant improvement in student learning outcomes. In Cycle I, the implementation of the UNO Card-based Numbered Heads Together (NHT) model demonstrated initial potential for changing classroom dynamics. Although the learning atmosphere began to improve and interaction between students increased, the overall learning outcome only reached 57%. This achievement fell short of the 80% success indicator target. Based on Cycle I reflections, strategic improvements were made in Cycle II, focusing on strengthening the teacher's role as a facilitator and simplifying instructional language. As a result, there was a drastic improvement, with the average class score rising to 85.90, with a classical completion rate of 86%. This achievement exceeded the established performance indicator target, thus declaring this research a success.

ACKNOWLEDGEMENTS

Praise be to Allah SWT for His grace and guidance, enabling the successful completion of this research. The author expresses sincere gratitude to the Principal of SD Negeri 81/II Muara Bungo for the permission and support granted, as well as to the Grade V teachers, who served as collaborators for their assistance in the field. He also extends his deepest appreciation to all Grade V students for their enthusiasm and active participation throughout the learning process. He also extends his gratitude to his beloved family and colleagues for their continuous prayers and endless moral support. Hopefully, the results of this research will make a tangible contribution to the advancement of education.

REFERENCES

Asri, A. S., & Nurhayati, N. (2022). *Metodologi Penelitian Tindakan Kelas: Teori dan Implementasi dalam Pembelajaran*. Jakarta: PT Raja Grafindo Persada.

- Hidayah, N. (2023). *Penerapan Model Numbered Heads Together (NHT) untuk Meningkatkan Keaktifan Belajar Siswa*. Yogyakarta: Deepublish.
- Hidayat, A., & Setiawan, M. (2023). *Metodologi Penelitian Kualitatif & Kuantitatif: Pendekatan Terintegrasi dalam Bidang Pendidikan*. Jakarta: PT RajaGrafindo Persada.
- Indrawati, F., & Syafari, R. (2022). Analisis Kemampuan Berpikir Tingkat Tinggi Siswa dalam Menyelesaikan Masalah Matematika Berdasarkan Teori Polya. *Jurnal Pendidikan Matematika*, 13(2), 145-158.
- Mulyani, S., & Hartono, A. (2023). Pengembangan Kompetensi Pedagogik Guru Melalui Classroom Action Research di Era Digital. *Jurnal Inovasi Pendidikan*, 10(2), 156-170.
- Nursalam, N., et al. (2023). Tantangan Literasi Matematika Siswa Indonesia: Analisis Berdasarkan Standar PISA. *Jurnal Inovasi Pendidikan Matematika (JIPM)*, 5(1), 22-35.
- OECD. (2023). *PISA 2022 Results (Volume I): The State of Learning and Equity in Education*. OECD Publishing. <https://doi.org/10.1787/53f23881-en>
- Pradana, G. W., & Syarifuddin, A. (2024). *Model-Model Penelitian Tindakan dalam Pendidikan: Analisis Perbandingan Kemmis, McTaggart, dan Lewin*. Bandung: Alfabeta.
- Pratama, R. A., dkk. (2024). *Statistik Pendidikan: Panduan Praktis Analisis Data untuk Skripsi dan Tesis*. Bandung: Alfabeta.
- Prasetyo, B., & Azizah, N. (2023). *Metodologi Penelitian Tindakan Kelas: Teori dan Praktik di Sekolah Dasar*. Jakarta: PT RajaGrafindo Persada.
- Putra, A. S., Santosa, H., & Wijaya, K. (2023). *Evaluasi Pembelajaran: Teori dan Praktik dalam Kurikulum Merdeka*. Jakarta: PT RajaGrafindo Persada.
- Putra, R. E., & Apdoludin. Model dan Metode Pembelajaran. Jawa Tengah: Lakeisha
- Rahayuningsih, S., et al. (2024). Evaluasi Kemampuan Pemecahan Masalah Matematis Siswa SMP dalam Implementasi Kurikulum Merdeka. *EduMath: Jurnal Pendidikan Matematika*, 15(1), 88-102.
- Sari, R. K., dkk. (2024). *Desain Instruksional dalam Penelitian Tindakan Kelas: Strategi Meningkatkan Kualitas Pembelajaran*. Bandung: Alfabeta.
- Sari, M. P., & Ramli, M. (2022). *Pengembangan Instrumen Penilaian Berbasis Higher Order Thinking Skills (HOTS) di Sekolah Dasar*. Bandung: Alfabeta.

- Simamora, R. E., et al. (2023). Hubungan Antara Kemampuan Literasi Matematika dengan Konteks Kehidupan Nyata pada Siswa Sekolah Menengah. *Jurnal Riset Pendidikan Matematika*, 10(2), 210-224.
- Sudarman, S., et al. (2024). Analisis Faktor Rendahnya Skor PISA Matematika Indonesia dan Relevansinya Terhadap Strategi Pembelajaran di Kelas. *Jurnal Pendidikan dan Kebudayaan*, 9(1), 45-60.
- Sudarman, S., et al. (2023). *Panduan Praktis Menyusun Penelitian Tindakan Kelas untuk Guru Profesional*. Yogyakarta: Deepublish.
- Suhardi, S. (2022). *Analisis Data Penelitian Tindakan Kelas (PTK): Teori dan Aplikasi*. Yogyakarta: Deepublish.
- Wahyuni, S., & Saputra, A. (2022). Inovasi Media Pembelajaran Matematika: Integrasi Permainan Kartu dalam Model Kooperatif. *Jurnal Riset Pendidikan Matematika*, 10(1), 45-58.
- Wibawa, R. P., & Agustina, F. (2022). Relevansi Model Kemmis dan McTaggart dalam Meningkatkan Hasil Belajar Kognitif Siswa di Sekolah Dasar. *Jurnal Riset Pendidikan Dasar*, 5(1), 12-25.
- Wulantina, E., et al. (2023). Pengembangan Instrumen Tes Berbasis HOTS (Higher Order Thinking Skills) Menggunakan Langkah-langkah Polya. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 7(3), 2890-2905.
- Yuberti, Y., & Wardani, S. (2024). *Metodologi Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan PTK*. Yogyakarta: Deepublish.