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Enhancing Mathematics Learning Outcomes in Multiplication for Grade IV Students through the Use of Finger Calculator and TGT Method

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Abstract
The purpose of this study is to explore how the use of finger calculator and TGT (Teams Games Tournament) can enhance the learning outcomes in multiplication among fourth-grade students at SDN 3 Ringinkembar. This action research follows the model by Kemmis and McTaggart, which includes four stages: planning, implementation, observation, and reflection. To collect data, we used field notes, interviews, quantitative test results, and qualitative observations of both teachers and students. The study was conducted in two cycles with fourth-grade students in May 2019. The reflection stage involved analyzing test results and the application of TGT alongside the finger calculator. The findings indicated that using the finger calculator with the TGT method had positive effects. The students showed increased enthusiasm and improved teamwork, which significantly enhanced their learning outcomes in multiplication. The completion rate rose from 45% to 85% after implementing finger calculator and TGT, demonstrating the effectiveness of these methods in improving the students' understanding and mathematical performance.

Keywords: Learning Outcomes, Mathematics, Multiplication, Finger Calculator, TGT

1. INTRODUCTION

Mathematics is important to study because it is used in many areas of life. It involves understanding shapes, patterns, concepts, and, most importantly, logical thinking, all of which are interconnected. Because of its significance, every student, at every level of education, needs to master the basic concepts of mathematics.

Many students find mathematics difficult and often dislike it. This can be due to certain shortcomings in teaching, such as relying on shortcuts in lessons, punishing students without understanding the reasons for their mistakes, expecting students to fail, ignoring individual differences, acting superior, being unfair, and not respecting students' rights (Martyanti & Suhartini, 2018; Said, 2021). Additionally, teachers often rely solely on the textbook, teaching concepts by memorization, using monotonous

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methods, and giving little consideration to the students' prior knowledge and skills. (Fathoni, 2023; Fransiska, Subagia, & Sarini, 2018; Salirawati, 2018).

The results of the daily multiplication test for grade IV students at SDN 3 Ringinkembar in the first semester of the 2019-2020 academic year showed that many students struggled to master the material. Despite the teacher's efforts to explain the concepts, provide examples, give practice exercises, and offer opportunities for students to ask questions, only a few students actively engaged by asking questions. When the teacher asked questions, only a small number of students were able to answer correctly, and even the high-achieving students scored poorly on the test. This issue is evident from the analysis of students' daily and semester test results. Only 45% of the students met the required standards in mathematics, which is considered very low. Many students scored below the school's cut score (KKM), which is set at 70.

Teacher-centered learning methods often make students lose interest in mathematics. Additionally, the limited use of learning media can reduce the effectiveness of teaching. When students are not engaged, they tend to struggle with understanding and mastering the material.

One of the methods for teaching mathematics is using a finger calculator along with the TGT method. The finger calculator method uses finger visualization to assist in the multiplication process. The researchers implemented this method because it is simple, easy to apply, and can be used effectively at different learning levels. Additionally, introducing a new technique in learning can make the students more engaged and enjoy the process.

There are some studies in the realm of applying finger calculator in mathematics learning. One relevant study by Ratih and Ristinawati (2014) focused on improving numeracy skills using the finger calculator method in mathematics for grade III students at SD Negeri Nogosari 3 Glonggong, Boyolali. The study showed that the finger calculator method significantly improved students' numeracy skills, with their average score rising from 59.6 to 84.21 after classroom interventions. Another relevant study was conducted by Rahim (2017), which explored the use of the finger calculator method to enhance numeracy skills in mathematics for grade IV students at MIN Lampisang, Aceh Besar. This research found that the technique led to an increase in numeracy skills, with the students' cut score improving from 67 to 82. While the finger calculator method has been the focus of several studies, there is little research that combines this method with TGT (Team Games Tournament). Exploring the integration of these two methods presents an interesting opportunity, offering a fun and engaging alternative for teaching multiplication while promoting greater student involvement.

Based on observations and previous research, the researchers aim to address the challenges of teaching mathematics to grade IV students. This study focuses on using finger calculator to teach multiplication, with the goal of improving the learning outcomes of grade IV students at SDN 3 Ringinkembar.

2. LITERATURE REVIEW

2.1 Mathematics Learning Outcome

Learning outcomes cover different aspects, including behavior patterns, values, understanding, attitudes, appreciation, and skills. This idea highlights the need to see learning outcomes in a broader sense, not just focusing on cognitive aspects, but also considering attitudes and values (Bentriska & Suprijono, 2022; Suprijono, 2012).

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Soedijarto (2017) defines learning outcomes as the level of mastery students reach based on the educational goals that have been set. In this context, learning outcomes reflect how well students meet the learning objectives that have been established (Arisanti, 2021). Learning outcomes are lasting changes in a person's behavior that occur as a result of their interaction with the environment (Simaremare & Purba, 2021; Uno, 2008). According to Lindgren (1976), learning outcomes encompass skills, information, understanding, and attitudes. This perspective highlights that learning outcomes go beyond mere knowledge; they also include abilities and attitudes that students internalize. In addition, Dimyati and Mudjiono (2013) describe learning outcomes as the results of the interaction between teaching and learning activities. In this context, learning outcomes signify the culmination of the learning process, which involves meaningful interactions between teachers and students (Kustian, 2021).

In conclusion, learning outcomes encompass more than just knowledge. They also include behavioral patterns, values, attitudes, and skills. It's important to consider non-cognitive aspects, such as attitudes and values, when assessing learning outcomes. The goal of learning is to reach a level of mastery that fosters lasting behavioral changes in individuals. Additionally, learning outcomes reflect how individuals interact with their environment, leading to a deeper understanding and the development of positive skills and attitudes.

2.2 Multiplication

In elementary school, there are four basic arithmetic operations: addition, subtraction, multiplication, and division. Multiplication is the process of finding the total when one number is repeated a certain number of times. It’s one of the key operations in arithmetic, alongside addition, subtraction, and division. Essentially, multiplication is the same as repeated addition. For example, 4 x 2 means adding 4 twice, which can be written as 4 + 4 = 8. This is why students need to be confident in addition before learning multiplication.

According to Heruman (2007), multiplication is a challenging topic for some students. Many upper elementary students still struggle to master multiplication, which leads to difficulties when learning more advanced math topics.

2.3 Finger Calculator

The finger calculator, or *K Jart*, is a technique for performing mathematical calculations using fingers as a counting tool. It is particularly useful for multiplying whole numbers quickly and efficiently. According to Supriatna and Sulaeman (2007), the finger calculator allows for fast calculations by using all ten fingers to perform multiplication, whether for single digits, tens, hundreds, or even thousands. This method offers several benefits, such as visualizing the counting process, making math more enjoyable, reducing the mental load on children's memory, and being cost-free since fingers are always available as the tool. Each finger on both hands represents specific numbers, which simplifies multiplication by treating the extended fingers as tens and the folded ones as units. The finger calculator is designed to enhance students' ability to multiply whole numbers by breaking down multiplication as repeated addition. It helps students understand and execute multiplication more effectively, making the learning process smoother and more engaging.

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3. METHODS

This study is a classroom action research using a qualitative approach. It follows the Kemmis and McTaggart model, which consists of four stages: planning, implementation, observation, and reflection (Nurjanah, 2020). In this study, the researchers worked with a fourth-grade teacher at SDN 3 Ringinkembar to improve mathematics learning, specifically in multiplication and division. Data were collected through field notes, interviews, test result analysis, and classroom observations of both teachers and students. The study involved two cycles, each with four stages, and took place on May 9-10 and May 16-17, 2019. During the reflection stage, the data from each cycle, including the use of the TGT and finger calculator cooperative learning models, as well as the students' final test scores, were analyzed.

Next, the data from field notes, observations, interviews, and questionnaires were analyzed together with the fourth-grade teacher and colleagues. The findings were then interpreted using relevant literature and the teacher's experiences. At the same time, students' multiplication skills were assessed by calculating the average evaluation results using the following formula:

$$M = \frac{\sum fx}{N}$$

M = Mean
∑fx = Total number of students' scores
N = Total number of students

Mastery of multiplication calculations is achieved when 80% of students score an average of above 80 in the evaluation. Students are considered proficient in multiplication if they score 80 or higher, which is classified as a good score.

Description:
90 - 100 = Excellent
70 - 89 = Good
50 - 69 = Fair
30 - 49 = Poor
0 - 29 = Very poor

4. FINDINGS AND DISCUSSION

4.1 Mathematics Learning Process for Multiplication Using Finger Calculator and TGT

Before this study, the mathematics learning outcomes of grade IV students at SDN 3 Ringinkembar were still low. This was evident from an analysis of their daily and semester test results, where many students scored below the school's cut score of 70. One of the main causes was the teacher-centered approach during lessons, where students were often passive listeners. As a result, students became less active and less motivated in learning. Additionally, they had limited understanding of alternative methods for solving arithmetic problems in mathematics.

In the learning environment, students often take on a passive role, primarily listening, writing, completing assignments, and receiving evaluations. Their engagement in the learning process is quite limited, making it challenging for them to participate actively. According to Whipple, as cited in Hamalik (2009), effective student learning involves physical, mental, intellectual, and emotional participation, which leads to successful learning outcomes across cognitive, affective, and psychomotor domains. However, due to their passive involvement, students often feel bored and struggle to

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grasp the material presented by the teacher. This is especially true in mathematics, a subject many students find difficult and tend to avoid.

Students often rely heavily on memorization techniques to solve mathematical problems, but not all students have the same ability to memorize effectively. According to Dian (2019), teachers continue to dominate the learning process and tend to use traditional, one-way lecture methods, which limits innovative teaching approaches. As a result, student learning outcomes remain low. For instance, at SDN 3 Ringinkembar, only 45% of grade IV students have achieved passing marks in mathematics, a figure that falls significantly short of expectations.

To address this issue, the researchers collaborated with the classroom teacher to implement a more interactive learning method: the finger calculator technique combined with the Teams Games Tournament (TGT) cooperative learning model in mathematics lessons. According to Rusman (2010), the TGT method is "a type of cooperative learning that places students in study groups of 5 to 6 students with diverse abilities, genders, and backgrounds." This approach was chosen because it promotes the formation of varied groups, including students of high, medium, and low abilities. The main objective is to help students with lower abilities grasp the material through explanations provided by their more capable peers. Observations indicate that some students find it easier to understand concepts when their classmates explain them rather than when the teacher does.

The Teams Games Tournament (TGT) method was implemented in two stages: cycle I and cycle II. The researchers observed changes in the overall performance of students before and after applying this method. To measure these changes, an initial test (pretest) was conducted prior to implementing the TGT method, followed by a final test (posttest) after its implementation. The main goal is to determine whether this method can improve the mathematics learning outcomes for grade IV students.

Cycle I

The cycle I was conducted on May 9 and May 10, 2019. On May 9, the session took place from 10:00 to 10:40 AM. The actions for cycle I followed the learning plan that had been prepared in advance. During the core activities, the researchers emphasized the importance of students developing their multiplication skills. However, some students expressed difficulty with mathematics, particularly with memorizing multiplication. To address this, the researchers introduced the finger calculator, explaining how it works for multiplication. Initially, there was some excitement and chatter as the students began to try out the method. The researcher then wrote questions on the board for the students to answer using the finger calculator.

The researchers then distributed pretest sheets to the students to assess their scores before implementing the TGT method. Since we were not the regular class teacher, this pretest aimed to gather baseline data on the students' performance. The pretest consisted of 10 multiple-choice questions, and students were given 15 minutes to complete it.

After collecting the data, it was found that only 33% of students successfully completed the material, which was classified as a D (poor) score. Meanwhile, the percentage of students who did not complete the material was quite high at 67%. Following the pretest, the researchers explained to the students that mathematics can be enjoyable, particularly through the use of the TGT method. The class, consisting of 33

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students, was then divided into six groups: three groups of 6 students and three groups of 5 students. Each group of 6 students included 1 high-achieving student, 2 students with average abilities, and 3 students with lower abilities. In the groups of 5 students, there was 1 high-achieving student, 2 average students, and 2 lower-ability students. These groupings were based on the students' pretest results.

The researchers began by explaining the rules and stages of the TGT method and gave a brief overview of the multiplication material. This was done to assess how well the students understood multiplication. To connect the new material with what had already been taught, we asked them multiplication-related questions. After the brief explanation, questions for the TGT activity were distributed. TGT was conducted in three sessions: the first with easy questions, the second with medium-level questions, and the third with difficult questions. Each session lasted 5 minutes. Within their groups, the students divided the tasks based on the number of questions and the number of group members.

After distributing the questions, the researchers instructed the students to begin working on them. Each student was assigned one question based on their ability. Students with lower abilities received guidance from their higher-ability peers, who were also working on their own tasks. They had 15 minutes to complete the questions. Once they finished, the researchers calculated the scores, and the highest scorer received a star. By the second session, the classroom became more energetic as each group grew more enthusiastic about competing for the highest score.

TGT continued until the third session. By the end of this session, most students had begun to understand how to use the finger calculator, although some were still confused about operating it for multiplication. At the end of the lesson, the researcher asked the students questions to gather their feedback on the learning experience. Finally, the lesson was concluded with a greeting from the researchers.

At the beginning of the pretest, it was revealed that the completion rate was only 33%, categorized as a D (poor). Meanwhile, the percentage of those who did not meet the criteria was very high, at 67%. In cycle I, 24 students achieved the required score, while 9 students did not, which was fewer than in the pretest.

During the reflection stage, the researchers identified and addressed the shortcomings in the pretest, TGT implementation, and posttest in cycle I. These issues, which would be corrected in cycle II, include the following:

1. In cycle I, 73% of the students achieved passing scores on the posttest, which was categorized as a B. However, it was not fully satisfied and we decided to move forward with cycle II, focusing on improving the evaluation process. In cycle I, the evaluation was only conducted after the posttest. For cycle II, the researcher planned to evaluate the questions together with the students after each posttest and TGT session.
2. During cycle I, many students struggled with questions involving decimal multiplication.
3. In cycle I, some students in each group were passive and did not actively participate in completing the assigned tasks. To address this in cycle II, we planned to assign group members randomly to encourage more engagement.

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Cycle II

The cycle II took place on May 16 and 17, 2019. On May 16, the researchers administered a pretest and implemented the TGT method. The following day, May 17, a posttest was given, along with an evaluation of cycle II. Similar to cycle I, before starting the three activities, we began the lesson by asking questions and giving a brief explanation of multiplication to assess the students' readiness for the TGT method in cycle II.

In the TGT implementation, there were still three sessions: session 1 with easy questions (on pink paper), session 2 with medium difficulty questions (on green paper), and session 3 with difficult questions (on blue paper). However, the questions in each session were different from those in cycle I, although they still covered multiplication material. The changes were made because many students had difficulty with decimal multiplication in cycle I. The researchers wanted to see if there were any improvements after the evaluation conducted in cycle I.

After collecting the data, it was found that 26 out of 33 students successfully met the learning objectives, while 7 students did not. Comparing the results from cycle I to cycle II, there was an increase in the number of students who met the objectives, showing improvement from cycle I to cycle II.

The researchers then reorganized the groups based on the students' abilities, keeping the same group sizes as in cycle I. With 33 students in grade IV, the class was divided into 6 groups: 3 groups of 6 students and 3 groups of 5 students. Each group of 6 included 1 high-ability student, 2 medium-ability students, and 3 low-ability students. The groups of 5 were made up of 1 high-ability student, 2 medium-ability students, and 2 low-ability students.

After briefly explaining multiplication, the researchers distributed questions to implement the TGT method. TGT consists of three sessions: the first session featured easy questions, the second included medium questions, and the third presented difficult questions. Each group had 5 minutes to work on the questions in their session. In each group, the students divided the tasks based on the number of questions and group members. Once the questions were distributed, the researchers instructed the students to begin working on them. Each student tackled one question that matches their ability level. The students with lower abilities received support from their peers who have higher or medium abilities. The total time allocated for this task was 15 minutes.

After the students finished their work, the researchers calculated their scores. The group with the highest score earned a star, and the group that collected the most stars received an award or prize. Meanwhile, the group that did not perform well faced a consequence, such as practicing Pancasila or singing a mandatory song.

Once the questions were complete, the data could be collected. In the cycle II posttest, 28 students passed, which is an increase compared to the cycle I posttest. Only 5 students did not pass in cycle II, a decrease from cycle I. Overall, the results indicate a significant improvement in student performance. The completion percentage for the cycle II posttest was 85%, categorized as "good," which is higher than the 73% completion rate from the cycle I posttest.

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4.2 Mathematics Learning Outcomes for Multiplication Using Finger Calculator and TGT

The results of the study in cycle I indicated that the students' performance at the pretest stage was quite low. Out of 33 students, only 11 were able to complete the test, while 22 students did not meet the completion criteria. This meant that only about 33% of the students completed the pretest, leaving 67% who did not.

Following the pretest, we implemented the TGT, which consisted of three sessions with varying levels of difficulty. After completing the TGT, we conducted the post-test for cycle I. The results showed improvement: 24 students successfully completed the posttest, while 9 students did not. This raised the completion percentage to approximately 73%, with only 27% of students still not achieving completion.

After completing cycle I, we proceeded to cycle II, which involved three sessions. In Session 1, the students tackled easy questions, indicated by pink paper; session 2 featured medium-difficulty questions on green paper; and session 3 presented difficult questions on blue paper. During the pretest for cycle II, 26 students successfully completed the assessment, while 7 students did not. This resulted in a completion rate of approximately 79%, with 21% of students still needing to achieve completion.

After completing the questions, the data revealed that in the cycle II posttest, 28 students successfully completed the assessment, while 5 children did not. This marks an improvement compared to cycle I. The percentage of students who completed the test in cycle II was 85%, which is categorized as 'good' and is higher than the 73% completion rate in cycle I. Figure 1 shows the results of cycle I and cycle II.

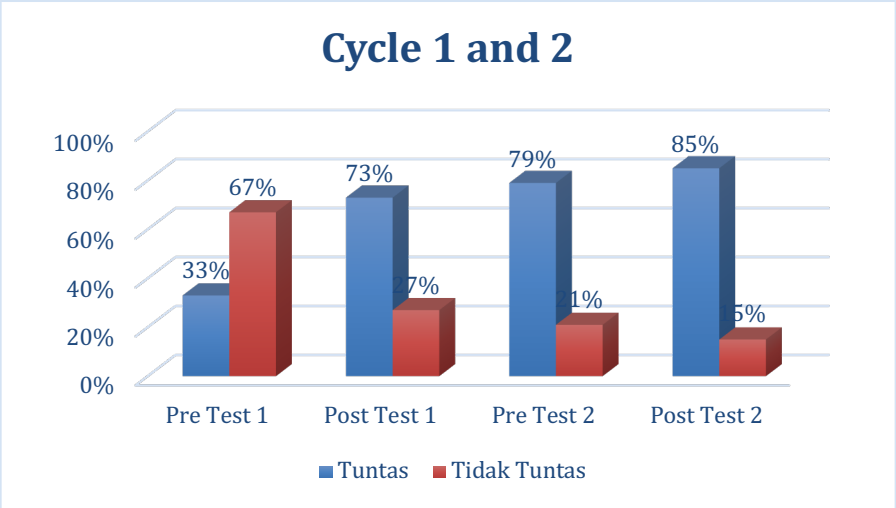

Figure 1. The results of cycle I and cycle 2

The figure above shows a noticeable increase in student completion rates from cycle I to cycle II. This indicates that the TGT-assisted finger calculator method has been positively received by the students. Similar findings were reported in Rahim's research (2017), which also highlighted an improvement in student abilities using the finger calculator method. However, Rahim's study focused solely on the method without incorporating TGT. The combination of the finger calculator method with TGT creates a fresh and engaging learning environment for students, which enhances their interest and leads to better test results.

In cycle I, the researcher faced several challenges when implementing the TGT method. Some students were less enthusiastic and appeared sleepy, which negatively affected their TGT results. Additionally, there were disagreements among some students in their groups. Due to their young age, small issues were often exaggerated, leading to some students not speaking to each other. Another issue observed was that several grade IV students at SDN 3 Ringinkembar struggled to focus on understanding the questions. This posed a challenge during TGT, especially for certain groups of students. In one group, a student had to assist a friend by reading the questions aloud, as this child had difficulty reading. According to Sari (2018), students who lack strong reading skills may struggle with the understanding process, which can decrease their interest in the subject being studied. This issue can be caused by two factors: internal factors, such as the student's reading ability and lack of reading habits, and external factors, such as inadequate environmental support in encouraging reading.

In cycle II, the students' attitudes improved noticeably. More students actively engaged in completing the tasks, even when they found them challenging. They kept trying because the researchers allowed them to choose their own group members in the TGT method. This was different from the first cycle, where, despite better TGT results, group interactions were limited due to conflicts among some group members. According to Nur (2019), the TGT method reduces students' fear of making mistakes when answering questions. It helps train and develop their abilities. The implementation of the finger calculator and the TGT method has significantly enhanced grade IV students' multiplication learning.

6. CONCLUSION

Based on the findings, it can be concluded that using the finger calculator combined with the TGT (Teams Games Tournament) significantly improved the learning of multiplication in grade IV. First, this approach successfully boosted the students' enthusiasm for learning mathematics, especially through teamwork in completing assignments. Second, there was a marked improvement in the students' performance in multiplication. Before using finger calculator and the TGT method, only 45% of students met the learning objectives. After its implementation, this number jumped to 85%. The combination of finger calculator and the TGT method has proven to be effective in enhancing students' understanding and performance in mathematics.

REFERENCES

Arisanti, D. (2021). Upaya Peningkatan Aktivitas dan Hasil Belajar Fisika melalui Model Pembelajaran Kooperatif Tipe Games Turnaments (TGT). *EduPsyCouns: Journal of Education, Psychology and Counseling*, *3*(2), 112–120.

B. Uno, Hamzah. (2008). T*eori Motivasi dan Pengukurannya*. Jakarta : Bumi Aksara.

Bentriska, H. K., & Suprijono, A. (2022). Pengaruh Media Pembelajaran Educandy terhadap Hasil Belajar Kognitif Sejarah Siswa SMAN 3 Sidoarjo. *AVATARA, e-Journal Pendidikan Sejarah*, *12*(4).

Dimyati & Mudjiono. (2013). *Belajar & Pembelajaran.* Jakarta: Rineka Cipta.

Fathoni, T. (2023). Mengintegrasikan Konsep Vygotsky dalam Pendidikan Islam: Upaya Orang Tua dalam Memaksimalkan Potensi Anak. *Muaddib: Jurnal Pendidikan Agama Islam*, *1*(1), 31–38.

Fransiska, L., Subagia, I. W., & Sarini, P. (2018). Pengaruh model pembelajaran guided

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DOI: https://doi.org/10.35457/josar.v10i1.4035

discovery terhadap keterampilan proses sains siswa SMP Negeri 3 Sukasada. *Jurnal Pendidikan Dan Pembelajaran Sains Indonesia (JPPSI)*, *1*(2), 68–79.

Hamalik, Oemar. (2009). Pendekatan Baru Strategi Belajar Mengajar Berdasarkan CBSA. Bandung: Sinar Baru Algensindo.

Heruman. (2007) Model Pembelajaran Matematika. Bandung: PT Remaja Rosdakarya.

Kustian, N. G. (2021). Penggunaan metode mind mapping dalam meningkatkan hasil belajar siswa. *ACADEMIA: Jurnal Inovasi Riset Akademik*, *1*(1), 30–37.

Lindgren, H. C. (1976). *Educational psychology in the classroom*. New York: John Wiley & Sons

Martyanti, A., & Suhartini, S. (2018). Etnomatematika: Menumbuhkan kemampuan berpikir kritis melalui budaya dan matematika. *IndoMath: Indonesia Mathematics Education*, *1*(1), 35–41.

Milawati, Nur Afwa. (2019). *Pengaruh Model Pembelajaran Times Games Tournaments (Tgt) Terhadap Hasil Belajar Ipa Ditinjau Dari Self Confidence Peserta Didik Kelas Vii Di Smp Amal Bakti Jati Agung Lampung Selatan*. Universitas Islam Negeri Raden Intan Lampung: Lampung .

Nurjanah, N. E. (2020). Pembelajaran stem berbasis loose parts untuk meningkatkan kreativitas anak usia dini. *Jurnal Audi: Jurnal Ilmiah Kajian Ilmu Anak Dan Media Informasi Paud*, *5*(1), 19–31.

Pelu, M. (n.d.). Nilai Historis Candi Cetho Sebagai Sumber Dan Materi Pendidikan Budi Pekerti Berbasis Budaya Lokal. *DAN PENULISAN SEJARAH KRITIS*, 87.

Rahim, Rika. (2017). *Penerapan Teknik Jarimatika untuk Meningkatkan Keterampilan Berhitung pada Pembelajaran Matematika di Kelas IV MIN Lampisang Aceh Besar*. UIN Ar-Raniry Banda Aceh: Aceh Besar

Ratih, N., & Risminawati, M. P. (2014). *Peningkatan Kemampuan Berhitung Melalui Metode Kalkulator Jarimatika Pada Mata Pelajaran Matematika Kelas III SD Negeri Nogosari 3 Glonggong Nogosari Boyolali Tahun Ajaran 2013/2014*. Universitas Muhammadiyah Surakarta.

Rusman, (2010). Model-model Pembelajaran. PT RajaGrafindo Persada.

Said, M. S. (2021). Kurangnya motivasi belajar matematika selama pembelajaran daring di MAN 2 Kebumen. *Jurnal Ilmiah Matematika Realistik*, *2*(2), 7–11.

Safitri, Dian (2019). *Pengaruh Model Pembelajaran Tgt (Team Game Tournament) Terhadap Hasil Belajar Matematika Siswa Kelas Iv Sdn 1 Pakuan Aji Tahun Pelajaran 2019/2020*. Institut Agama Islam Negeri (IAIN) Metro

Salirawati, D. (2018). *Smart Teaching: Solusi Menjadi Guru Profesional*. Bumi Aksara.

Sari, Citra Pratama. (2018). *Faktor-Faktor Penyebab Rendahnya Minat Membaca Siswa Kelas Iv* . Universitas Negeri Yogyakarta : Yogyakarta .

Simaremare, J. A., & Purba, N. (2021). *Metode Cooperatif Learning Tipe Jigsaw Dalam Peningkatan Motivasi Dan Hasil Belajar Bahasa Indonesia*.

Soedijarto. (2017). *Evaluasi Hasil Belajar*. Yogyakarta: Pustaka Pelajar.

Sulaeman. (2007). *Go Champion Metode Cepat Berhitung Angka*. Bandung: CV. Bintang Jaya Pratama.

Suprijono, Agus. (2012). *Cooperative Learning: Teori dan Aplikasi Paikem.* Yogyakarta: Pustaka Pelajar.