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## OPTIMIZING MULTIPLICATION LEARNING IN ELEMENTARY SCHOOLS THROUGH THE JARIMATIKA METHOD

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### Abstract

The aim of this study is to describe the multiplication skills of fourth-grade students at SDN Inpres Ardipura III Jayapura using the Jarimatika method and to examine the teacher's efforts to improve these skills. This is a qualitative study using Classroom Action Research (CAR) design, which was carried out in two cycles. The subjects of this study were all 30 students of the fourth grade at SDN Inpres Ardipura III Jayapura during the 2022/2023 academic year. Data collection methods included interviews, observation, tests, and documentation. Content validity was applied to ensure data validity, and interactive analysis techniques were used for data analysis. The results of this classroom action research, conducted in two cycles with the implementation of the Jarimatika method, showed a significant improvement in students' multiplication skills. The initial condition, before any intervention, showed an average score of 52.83 with a classical completeness percentage of 57%. In the first cycle, the average score increased to 63.50 with a classical completeness percentage of 63%. By the second cycle, the average score had risen to 76.17 with a classical completeness percentage of 87%. These findings indicate that, classically, the learning process achieved the minimum mastery criteria. Therefore, it can be concluded that the use of the Jarimatika method effectively enhances the multiplication skills of fourth-grade students at SDN Inpres Ardipura III Jayapura.

### Keywords:

Jarimatika method, Multiplication operation, Classroom Action Research.

### Abstrak

Tujuan penelitian ini adalah untuk mengetahui bagaimana gambaran keterampilan perkalian siswa di kelas IV SDN Inpres Ardipura III menggunakan metode jarimatika dan gambaran upaya guru dalam meningkatkan keterampilan perkalian siswa di kelas IV SDN Inpres Ardipura III Jayapura. Penelitian ini adalah penelitian kualitatif dengan jenis Penelitian Tindakan Kelas (PTK) terdiri dari dua siklus. Subjek penelitian ini adalah seluruh siswa kelas IV SDN Inpres Ardipura III Jayapura tahun Pelajaran 2022/2023 berjumlah 30 siswa. Metode pengumpulan data menggunakan metode wawancara, observasi tes, dan dokumentasi. Validitas data yang digunakan adalah validitas isi. Metode Analisis data yang digunakan adalah analisis interaktif. Berdasarkan hasil penelitian ini menggunakan tindakan kelas yang dilaksanakan dalam dua siklus dengan menerapkan metode jarimatika pada siswa kelas IV semester 2 SDN Inpres Ardipura III Jayapura tahun pelajaran 2022/2023 dapat disimpulkan bahwa pembelajaran menggunakan metode jarimatika dapat meningkatkan keterampilan perkalian siswa kelas IV SDN Inpres Ardipura III Jayapura. Hal ini terbukti pada kondisi awal sebelum dilaksanakan tindakan nilai rata-rata siswa 52,83 dengan presentase klasikal sebesar 57%, siklus I nilai rata-rata kelas 63,50 dengan presentase klasikal sebesar 63%, dan siklus II nilai rata-rata kelas meningkat menjadi 76,17 dengan presentase klasikal sebesar 87%. Dengan demikian secara klasikal, pembelajaran telah mencapai ketuntasan belajar.

### Kata Kunci:

Metode Jarimatika, Operasi hitung perkalian, penelitian tindakan kelas.

## INTRODUCTION

Mathematics is one of the most useful lessons in life. Mathematics trains systematic thinking that can be applied anywhere, from schools, markets to offices. In contrast to memorizing formulas, mathematics teaches a mindset to measure, calculate, and decide based on facts (Nurmilah, 2023; Durachman; 2020). In the future, maste

ring and developing technology requires a strong mastery of mathematics from an early age. Mathematics learning is a basic skill that needs to be mastered by students and one of the skills that students need to master in mathematics is numeracy skills (Mulyani et al., 2024; Ikhsani et al, 2024). Numeracy skills in mathematics lessons are a basic knowledge that students have to think critically, creatively, and express their thoughts both orally and in writing in a systematic, logical and

straightforward manner related to numbers (Fatimah et al., 2020). Learn More (Himmah et al., 2021; Rahayu et al., 2022) explains that numeracy skills are the ability to understand mathematics that focuses on the properties and relationships between real numbers. These skills include mastery of basic operations such as addition, subtraction, multiplication, and division, which are important foundations in recognizing and applying mathematical concepts thoroughly.

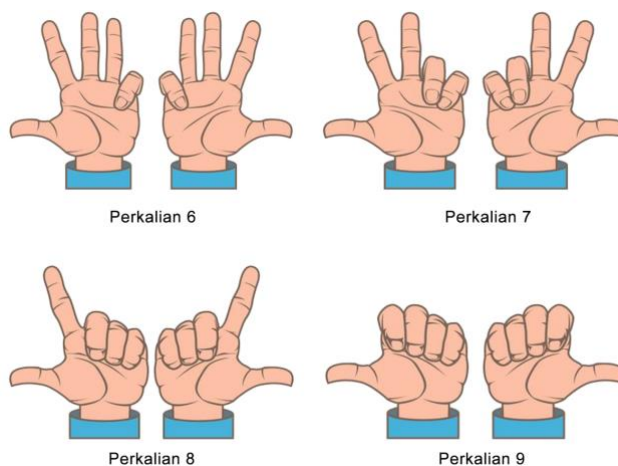
One of the numeracy skills that the researcher wants to improve is students' mastery in multiplication. Multiplication is one of the most basic number operations in mathematics, which serves as a simpler way to perform repeated summing or scaling one number by another. This operation is one of the four basic operations in basic arithmetic (the others being addition, subtraction and division) (Maulana et al., 2020). Multiplication uses  $\times$  symbols introduced by William Oughtred in 1631. In general, multiplication is an arithmetic operation that results in a new number greater than the number operated, and is the basis of a variety of more complex mathematical operations. Understanding of the concept of multiplication includes the ability to calculate, choose procedures, and decipher objects according to the properties of multiplication (Alansor & Safari, 2024). If students are skilled in summing then it will be easy to determine the multiplication result (Faujiah & Nurafni, 2022). Likewise, if students understand and are skilled in multiplication, then students will be fluent in division, because basically division is the opposite of multiplication. So it can be said that by mastering or skilling, multiplication becomes very important or also called a prerequisite skill for smooth learning of mathematics (Siregar et al., 2023). However, based on several previous studies, it is known that there are still many students who do not understand multiplication well. As one of the initial studies conducted by Hidayah (2022) that there are still many students who are not fluent in multiplication, even some fourth, fifth and sixth grade students have not been fluent in multiplication, students consider that mathematics is a difficult subject. This causes students to be afraid and lazy to learn mathematics, especially if they have to solve division or addition problems related to multiplication. In the end, students cannot complete the calculation operations correctly and the students' mathematics learning results cannot be completed. In addition, the choice of teaching methods that are not suitable will cause students to have more difficulty in learning Mathematics. Fatimah et al. (2020) said that the success of students in learning mathematics can be determined by expanding the appropriate teaching methods in the implementation of the teaching and learning process.

Learning relies heavily on the role of the teacher as the primary guide (Vygotsky, 1978), i.e., the person who helps the student develop from current abilities to more advanced abilities through direct guidance. Research by Akrom et al. (2024) demonstrates that teachers have successfully increased students' math scores from 65% to 92% effective guidance and input. In contrast, Sari et al. (2024) reported that elementary school students' numeracy scores increased by 79% due to clear and regular teacher explanations. The teaching and learning process is a two-way collaboration between teachers and students in school situations to achieve learning goals (Nopitasari & Khoiri, 2024), where the teacher's professionalism in planning, teaching, assessing, and improving turns difficult material into practical skills that students can use themselves.

Based on the results of interviews with class teachers, multiplication is a difficult topic because there are some students who are slow to grasp or accept multiplication material. This is because in conveying the concept of multiplication, many teachers have not used appropriate learning methods or media and prefer to use the method of memorizing multiplication. With such a concept, of course, in addition to turning off students' creativity, it also eliminates the element of meaningful learning.

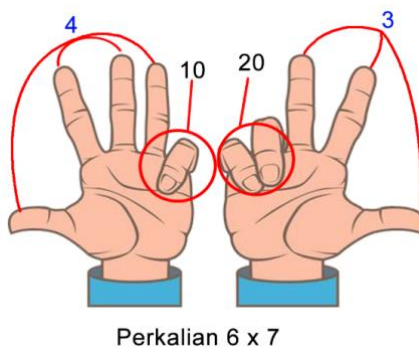
One of the methods that can be used in learning the concept of multiplication well is the jarimatics method. Soegijanti (2022) said that the Jarimatika Method is effective for improving computational ability, especially in multiplication operations. This method uses the position of the finger as the basis for large number multiplication and helps students understand the concept of multiplication concretely Jarimatika helps students in calculating basic multiplication with a simple and intuitive approach, so that mathematics is easier to understand than just memorizing. Jarimatika is a method or technique in performing mathematical calculations that uses the fingers of the right and left hands as an auxiliary tool. This method is designed to make the calculation process more

practical, efficient, fast, and precise, especially in performing arithmetic operations such as multiplication (Nasution & Surya, 2016). There are several stages and ways to use the jarimatics method in learning basic group multiplication (numbers 6-10): (1) Before learning jarimatik, students first need to understand numbers or symbols of numbers; (2) After that, students recognize the concept of multiplication operations; (3) Students were previously invited to have fun, either by playing or singing; (4) To introduce the symbols to be used in the rhythm. The introduction to direct practice is that students are asked to look at their palms with all their fingers open and then demonstrate the finger formation as shown in the picture below:



Picture 1. Illustration of multiplication using fingers

(5) Students are taught how to calculate with radiology with the provision of using the formula  $(X1 + X2) + (Y1 \times Y2)$ , where  $X1$  is the closed finger of the right hand (tens),  $X2$  is the closed finger of the left hand (tens),  $Y1$  is the finger of the right hand that is opened (unit), and  $Y2$  is the Finger of the left hand that is opened (unit); (6) Teachers and students perform multiplication operations by demonstrating using fingers.



Picture 2. Illustration of multiplication of six using fingers

Figure 2 shows the left hand of the little finger is closed and the right hand of the little finger and ring finger is closed, then the closed finger is worth tens, added up the open finger with a unit value, multiplied.  $6 \times 7 = (X1 + X2) + (Y1 \times Y2) = (10+20) + (4 \times 3) = 30 + 12 = 42$ ; (7) Invite students to continue to be happy, do not trouble students to memorize jarimatika symbols; (8) Practice regularly so that students will feel happy without any compulsion to memorize.

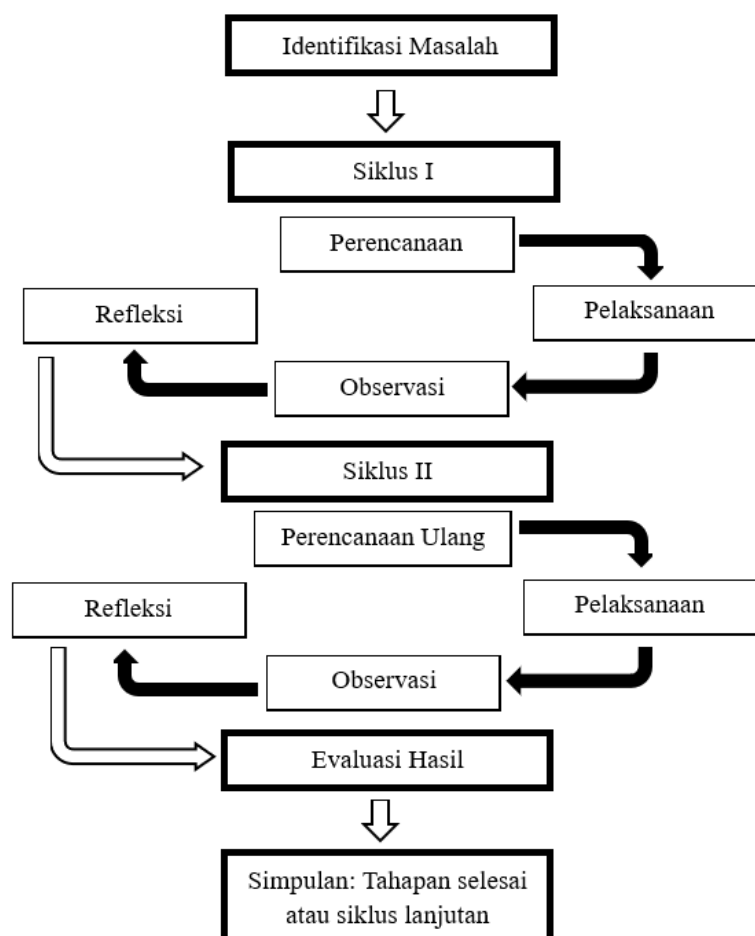
Various studies have proven that the Jarimatika method is very effective in improving students' numeracy skills, especially in multiplication materials at the elementary school level. For example, Fikri & Susanto (2024) found that the application of this method can improve the mathematics learning outcomes of 4th grade students, especially in understanding multiplication. In addition, Himmah et al. (2021) stating that this method not only helps students understand the material better, but also increases their motivation to learn. Soegijanti (2022) reported an increase in the average student score at SDN Kemijen 02 Semarang from 54 to 85 after using the Jarimatika

method. Research Rahmayanti (2023) revealed an increase in student learning completeness from 46% to 88% after the application of this method. Wafiroh & A'yun (2023) added that the Jarimatika method significantly improves students' multiplication calculation skills. At SDN Kalicari 01 Semarang, research by a team from STKIP Subang (2024) shows that the use of this method makes students more focused, active, and have high curiosity. Overall, these findings confirm that Jarimatika is an effective and fun learning strategy to improve mathematics learning outcomes, especially in multiplication operations.

Based on the background of the problem and the solutions to be applied, the researcher is interested in conducting research to see how the use of the arithmetic method can improve students' multiplication calculation skills.

## METHOD

This research is class action research (PTK). According to Susilo (2011: 2) Classroom Action Research is reflective research that is carried out on a cyclical basis (cycled) by teachers/prospective researchers in the classroom. This research procedure is in accordance with the classroom action research procedure carried out in the cycling/cycle process. Based on the analysis of the problem, this class action research is planned to consist of two cycles, each cycle consists of three meetings with four phases, namely action planning, action implementation, action observation and reflection on the actions that have been carried out in each cycle. The Class Action Research (PTK) carried out can be described in figure 2 as follows:



Picture 3. Research Procedure

The research was carried out in grade IV of SDN Inpres Ardipura III for the 2022/2023 school year. The location of the school is in Ardipura village, Jayapura sub-district south of Jayapura city. In this school there are 2 classes at each level with the number of students in grade IV A in the 2022/2023 school year, which is 30 people.

The data collection techniques in this study are by means of observation, interviews, documentation and tests. The performance indicator to be achieved in this study is the improvement of multiplication calculation skills with the jarimatics method in grade IV students in semester 2 of SDN Inpres Ardipura III hypothesis which is shown by obtaining a minimum score of 65 (KKM). In the first cycle, learning is said to be successful if students' numeracy skills reach an average grade of 65 and students who obtain a score of  $\geq 65$  (KKM) reach 60%. In cycle II, learning is said to be successful if students' numeracy skills reach an average grade of 70 and students who obtain a score of  $\geq 65$  (KKM) reach 70%.

## FINDINGS AND DISCUSSION

### Findings

Before carrying out the action, the researcher first gave an initial test to the students, to find out how much understanding and initial skills the students had in solving multiplication problems. The table of the frequency of students' multiplication counting skills before action can be seen in table 1 below:

**Tabel 1. Pre-Multiplication Test Scores for Elementary Students.**

No.	Interval	Frequency	Middle Value	$F_i \times X_i$	Percentage	Remarks
		$F_i$	$X_i$		%	
1	01-10	2	5.5	11	6.67	Under KKM
2	11-20	4	15.5	62	13.33	Under KKM
3	21-30	1	25.5	25.5	3.33	Under KKM
4	31-40	2	35.5	71	6.67	Under KKM
5	41-50	2	45.5	91	6.67	Under KKM
6	51-60	2	55.5	111	6.67	Under KKM
7	61-70	7	65.5	458.5	23.33	Above KKM
8	71-80	10	75.5	755	33.33	Above KKM
9	81-90	0	85.5	0	0.00	Above KKM
10	91-100	0	95.5	0	0.00	Above KKM
Quantity		30		1585	100	
Average value2				52.83		
Classical Completeness				57%		

Based on the results of the evaluation of the Mathematics pretest score conducted before the application of the jaythmatics method, the average class score of 52.83 was obtained. These results show that in general, student learning achievement is still relatively low because the average score has not reached the minimum expected standard. In this evaluation, there were 13 students whose scores were below the Minimum Completeness Criteria (KKM) which was 65, while 17 other students had achieved KKM. If you look at the distribution of these values, the classical completeness rate is only 57%. This means that only 57% of the total students in the class managed to meet the standards of learning completeness that have been set.

Classical completeness, which is still below the target of 70%, shows that the majority of students have not succeeded in mastering mathematics learning well. This can be an indication that learning has not been effective in improving students' understanding and learning outcomes. With conditions like this, teachers need to conduct the right evaluation and solutions in order to be more motivated by students in learning mathematics.

## Cycle I

Furthermore, the researcher carried out cycle 1 actions consisting of 3 meetings. Each meeting consists of two hours of lessons ( $2 \times 35$  minutes). The stages that are carried out are as follows:

### Planning Stage

At the planning stage, the researcher made observations on the learning process and learning achievement of Mathematics in grade IV for media, methods, learning strategies that have been used by teachers, and the learning process that has taken place. The researcher also recorded the learning results obtained by each student.

Based on observations and results of records on the learning process and learning achievements before action, information can be obtained as preliminary data. The recording results showed that out of 30 grade IV students, there were 13 students who were still unable to count multiplications. This is shown by the acquisition of scores of students who have not reached a score of 65 (KKM). The researcher also carried out Mathematics learning planning steps by applying the following jarrhythmic methods: (1) Learning K13 and the Syllabus of grade IV of elementary school; (2) designing lesson plans, LKS and evaluation sheets with classroom teachers; (3) Make observation sheets for teachers and students.

### Execution of Actions

At this stage, the researcher carries out learning using the jatirmatika method in accordance with the lesson plan that has been prepared. Learning in cycle 1 was carried out 3 times and cycle II Real conditions experienced during the teaching and learning process took place. As an initial activity, teachers and students greet and pray together, condition the class, attend students, and conduct perception. The teacher conducts perception by teaching singing "my balloon has five" together with the aim of making students relax in following the lesson. At the beginning of the lesson, the teacher asks the students about the sum of the numbers " $4 + 4 = \dots$ ,  $5 + 5 + 5 = \dots$ ".

The core activity begins with the teacher by explaining multiplication as a repeated addition. The teacher gave an example of calculating multiplication using the fingers of the numbers 1-5. Next, the teacher gave an example of a demonstration of multiplication of 6-10 with finger props. The teacher forms the students into several groups. The teacher told several students to demonstrate the rhythmic finger in front of the class. The teacher evaluates the results of the students' work. The teacher asks things that the students do not understand.

The final activity of teachers and students concludes the material that has been learned. The teacher provides feedback to students on the learning process and outcomes. The teacher reminded the students to repeat the lesson at home, the teacher closed the mathematics lesson.

### Observations

Based on observations of the implementation of learning in the classroom during 3 meetings, it was obtained that the level of suitability of the plan and its implementation was 86%. Based on the data above, it can be shown that the performance of teachers in cycle 1 learning activities is in the good category.

### Reflection

The data collected through observation is then analyzed. Based on the results of observations made during the process of implementing the action, the researcher found that the teacher was quite optimal in conveying information clearly so that it could be understood by students well. The teacher has also given a strict reprimand to students who do not pay attention to the lessons, although there are still some students who are still grabbing. Students are still not very active in answering teachers' questions. The willingness of students to accept lessons is still less visible. The courage of students to move forward in doing group work is still low.

If you look closely, the failure of students to complete the assignment during the learning process stems from the following things: 1) students do not understand learning with the jarimatika method, 2) there are still many students who are confused about the jarimatika formation or the steps used, because it is a new thing, 3) there are still students who like to disturb their friends so that it hinders the completion of the task. Thus, it can be seen that the research in cycle 1 has not

shown success in the learning process.

Based on the problems that have been explained above, the researcher seeks a solution by giving directions back to students about the formation by giving directions back to students about the jarhythmic formation or the steps used in learning using the jarhythmic method and calculating multiplication using the jarimatika method. In addition, the researcher provides a more difficult number concept so that students' numeracy skills are further improved.

The results obtained by students after using the jaitmatics method in cycle 1 can be seen in the appendix. The frequency data of the results of the mathematical evaluation after using the finger method in cycle 1 can be seen in the table below.

**Table 2. Cycle I Evaluation Results: Jarimatika Method in Mathematics.**

No.	Interval	Frequency	Middle Value	$F_i \times X_i$	Percentage	Remarks
		Fees	$X_i$		%	
1	01-10	0	5.5	0	0	under the KKM
2	11-20	0	15.5	0	0	under the KKM
3	21-30	0	25.5	0	0	under the KKM
4	31-40	2	35.5	71	6.67	under the KKM
5	41-50	4	45.5	182	13.33	under the KKM
6	51-60	5	55.5	277.5	16.67	under the KKM
7	61-70	7	65.5	458.5	23.33	Above KKM
8	71-80	11	75.5	830.5	36.67	Above KKM
9	81-90	1	85.5	85.5	3.33	Above KKM
10	91-100	0	95.5	0	0	Above KKM
Quantity		30		1905	100	
Average value2				63.50		
Classical Completeness				63%		

Based on the data from the evaluation results after using the jaitmatics method, the average class score was 63.50. Students who scored less than 65 (KKM) were 11 students and 19 students who got a score of  $\geq 65$  (KKM). This can be interpreted that the classical completeness of 63% is still below the set set, which is 70% of students get a score of  $\geq 65$  (KKM).

Based on the low mathematics evaluation scores that have not been able to reach the KKM, it shows that students' skills are still low. Therefore, follow-up actions are needed so that students' multiplication skills are improved so that student learning completeness can be achieved

## Cycle II

In the first cycle, the learning results of multiplication calculation skills have not reached completion. Therefore, the classroom action research was continued to the second cycle with the aim of correcting the shortcomings found in the first cycle. The implementation of the second cycle was carried out in three meetings on May 24 to 26, 2023, attended by 30 students with a time allocation of 2 x 35 minutes per meeting. The activities carried out in the second cycle are as follows:

### Planning

Based on the reflection of the first cycle, students' multiplication skills have increased but have not been maximized, as can be seen from some students who have not completed it. Improvements made by teachers include providing direction on jarimatic formations and introducing more difficult number concepts to improve multiplication skills. Based on the 2013 Curriculum for grade IV, the researcher carried out mathematics learning planning with the following jarimatic method: (1) Studying K13 and class IV syllabus related to mixed calculation operations and problem solving; (2) Designing lesson plans with teachers with indicators explaining and doing multiplication using jarimatika, carried out in 3 meetings (2 x 35 minutes); (3) Make LKS

and evaluation sheets; (4) Provide props in the form of fingers; (5) Make observation sheets for teachers and students.

### Execution of Actions

Meeting 1 was held on May 24, 2023, The material recognizes multiplication as repeated addition. The activity began with greetings, prayers, and apperceptions through the song "Balonku Ada Lima" to create a relaxed atmosphere. The teacher explains the concept of multiplication and demonstrates the rhythmic with the fingers (numbers 6-10). Students were divided into groups and some students practiced jarimatika in front of the class. The learning concludes with conclusions, feedback, and reminders to repeat at home.

Meeting 2 was held on May 25, 2023, Material for multiplication 6-10 using the jarimatika method. It began with prayer and perception through the song "Cut the Goose Duck" with movements. The teacher repeats and demonstrates the rhythm, the students imitate, and then work on the group worksheet. One of the groups presented the results of the discussion. The session ended with a conclusion, a reminder of studying at home, and a closing prayer.

Meeting 3 was held on May 26, 2023, Repetition of multiplication material 6-10. It began with prayer, attendance, and the perception of the song "Head of Knee Leg" with movement. The teacher repeats the finger formation and the rhythmic demonstration, the students work in groups working on the worksheet. After that, students do an individual post-test. The learning was closed with a question and answer session, closing prayer, and closing class.

### Observations

At this stage, the researcher observed students' attitudes and behaviors as well as teachers' teaching skills using the jarimatics method on multiplication materials during cycle 2 which took place in 3 meetings. From the results of observation, it is known that all 30 students who participated in the learning showed high enthusiasm and a strong desire to learn the jarimatika method. Their activeness in paying attention to the teacher's explanations and answering questions is very good, as is the courage of the students to come forward and demonstrate rhythmic in front of the class. In addition, students also do individual and group assignments seriously, so that student learning activities during cycle 2 can be categorized as very good.

Observation of the teacher shows that the teacher is able to convey the material clearly so that students understand the learning steps. Teachers also utilize various learning resources, provide motivation, and provide opportunities for students to ask questions and express opinions. Teachers reprimand students who lack focus firmly and apply the jarimatika method effectively. In addition, teachers succeed in creating a conducive learning atmosphere and managing learning time well. Teachers also provide final tests as a tool to measure the level of success of students in mastering the material. Based on these results, teachers' performance in cycle 2 learning is classified as very good.

### Reflection

In cycle 2, an in-depth discussion of observation data showed a significant increase in student activity compared to cycle 1. In cycle 1, students were less enthusiastic, less active in answering questions, and often chatting outside the material, and the courage to go forward in group work was still low. However, in cycle 2, students' willingness to accept lessons increased, enthusiasm was higher, the activeness of answering questions was very good, and the courage to demonstrate rhythmic skills also increased. Students did not have difficulty in doing multiplication problems using the rhythmic method and overall showed better multiplication activities and skills. This increase can be seen from the results of the mathematical evaluation in cycle 2 listed in the appendix and the frequency table of evaluation results.



**Table 3. Results from Cycle 2 Math Assessment with Jarimatika Implementation.**

No.	Interval	Frequency	Middle Value	Fi x Xi	Percentage	Remarks
		Fi	Xi		%	
1	01-10	0	5.5	0	0	under the KKM
2	11-20	0	15.5	0	0	under the KKM
3	21-30	0	25.5	0	0	under the KKM
4	31-40	0	35.5	0	0	under the KKM
5	41-50	1	45.5	45.5	3.33	under the KKM
6	51-60	3	55.5	166.5	10.00	under the KKM
7	61-70	4	65.5	262	13.33	Above KKM
8	71-80	12	75.5	906	40.00	Above KKM
9	81-90	5	85.5	427.5	16.67	Above KKM
10	91-100	5	95.5	477.5	16.67	Above KKM
Quantity		30		2285	100	
Average value2				76.17		
Classical Completeness				87%		

From the results of the 2nd cycle of research, the study reviewed that based on the performance indicators set, the researcher is said to be successful if the individual students' learning achievement shows at least 65 and classical shows 70% judging from the average score of mathematics learning classes using the jaritathmatics method has been successful but when viewed from the Minimum Completeness Criteria (KKM) there are still students who have not completed it. So the conclusion of the results of the 2nd cycle research can be said to be successful, because the number of individual students who get a score of at least 65 (KKM) has reached 87% and classically the average student score is categorized as more than enough. It was also shown to have a significant improvement in multiplication skills. From this fact, this class action research is considered sufficient and ends in cycle 2.

## Discussion

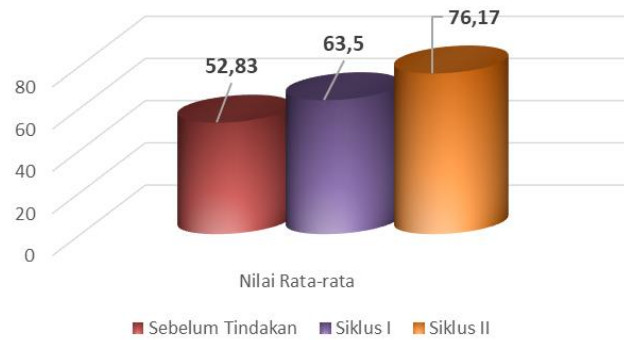
Based on the results of the research shown in several previous tables, there is an increase in the learning process, especially in students' multiplication skills in each cycle with the application of the radiatics method. This increase can be seen from the average learning score of students who have increased, starting from the initial condition before the action is given, then after the implementation of the action in cycle 1 and cycle 2, which each consists of three meetings. The data can be seen in the following table:

**Table 4. Average Mathematics Score and Percentage of Classical Completeness of Multiplication Skills Above KKM in Initial Conditions, Cycle I, and Cycle II.**

Average Score			Present (%)		
Before Action	Cycle I	Cycle II	Before Action	Cycle I	Cycle II
52,83	63,50	76,17	57%	63%	87%

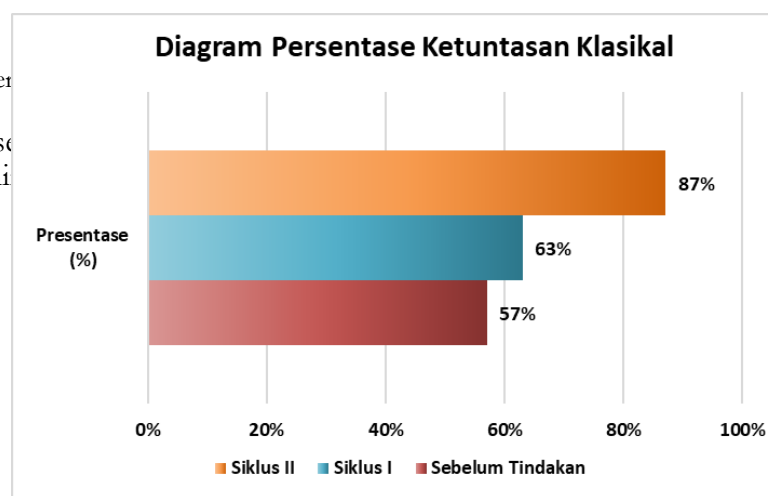
From the table above, it can be seen that the number of students who reached a score of  $\geq 65$  (KKM) has increased significantly. This shows that mathematics learning carried out by

teachers can be said to have improved their multiplication skills through the application of the rhythmic method.



Picture 4. Average

The increase in multiplication skills through the application of learning



Picture 5. Chart of the Percentage of Classical Completeness of Multiplication Skills Above the KKM in the Initial

Condition, Cycle I, and Cycle II

Picture 5. Chart of the Percentage of Classical Completeness of Multiplication Skills Above the KKM in the Initial Condition, Cycle I, and Cycle II

The obstacles encountered in each cycle are different, including: in cycle 1 the obstacles encountered are teachers who have not been able to convey information clearly and too quickly so that they cannot be understood by students, teachers have not given strict reprimands to students who do not pay attention to the lessons, it can be seen that there are some students who are still crowded, teachers have not been able to condition students towards conducive learning. The willingness of students to accept lessons is still not visible, students are still not so enthusiastic about the learning carried out. Students are less active in answering the teacher's questions because they are still chatting with other friends outside of the subject matter. The courage of students in coming forward and demonstrating rhythmic in front of the class is still not good.

The failure of students to complete the assignment during the learning process stems from the following things: 1) students do not understand learning with the rhythmic method, 2) many students are still confused about the rhythmic formation or the steps used, because it is a new thing, 3) there are still students who disturb their friends so that they hinder the completion of the task.

Efforts to overcome the obstacles that exist in cycle 1 which is carried out in cycle 2 in an effort to improve is to give directions back to students about the rhythmic formation or the steps

in learning using the jarhythmic method, at the time of learning the teacher asks the students to go forward to demonstrate the jarhythmic formation and calculate multiplication using the jarhythmic method. In addition, teachers provide difficult number concepts so that students' numeracy skills are improved. The results of observations in learning in cycle 2 show that problems that occurred previously can be overcome by teachers. Student learning

Thus, it can be known that one of the efforts to improve multiplication skills in fourth grade students of SDN Inpres Ardipura III Jayapura is by applying the jarhythmic method. This happens because learning with the finger rhythmic method. This happens because learning with the jarimatika method can make it easier to calculate multiplication without memorizing.

## CONCLUSION

Based on the data and evaluation results obtained in this study, the Jarimatika Method can be considered effective in improving the multiplication calculation skills of grade IV students at SDN Inpres III Jayapura. This conclusion is supported by the increase in average scores and the approach to or exceedance of the KKM in each learning cycle. Student learning completeness in multiplication skills increased significantly from the initial condition (52.83, 57% completeness) to cycle II (76.17, 87% completeness). This indicates that the Jarimatika method is effective in enhancing students' learning outcomes and numeracy skills, as shown by improved results in PTK within a single class of 30 students.

Learning with the Jarimatika method can also be seen to encourage students' enthusiasm, activeness, and courage in practicing the concept of multiplication using Jarimatika. This increase is evident in the results of observations from both Cycle I and Cycle II. The main obstacles in the initial cycle are the students' lack of understanding of the Jarimatika method, confusion in the operating steps, and interference from other students, which can be minimized through intensive direction and repetition. The role of teachers is crucial in delivering material clearly, motivating students, providing learning resources, managing classes, and offering constructive feedback to ensure effective and conducive learning. This study has methodological limitations, including a relatively small sample size, the absence of control groups, and time constraints associated with conducting class action research. Based on these limitations, it is hoped that future research will take these considerations into account.

## Suggestions:

Teachers are expected to continue using the Jarimatika method as a multiplication learning strategy because it has proven to be effective and able to make learning more fun and easy for students to understand.

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