

THE INFLUENCE OF THE USE OF JARITMATIC LEARNING METHODS ON NUMERATION ABILITY IN CLASS III STUDENTS OF ELEMENTARY SCHOOL

Melyani Sari Sitepu^{1*}
Wahyu Riski²
Bella Syahputri³

^{*1, 2, 3, 4, 5}Universitas Muhammadiyah Sumatera Utara

^{*1}email: melyanisari@umsu.ac.id

Abstract: The purpose of this study is to determine how well third grade primary school children use Jarimatika as a way to improve their multiplication computation skills. This study focuses on the role mathematics plays in assisting pupils in solving multiplication counting difficulties. This is a result of pupils' reduced ability to finish multiplication worksheets and their use of tedious teaching techniques, which makes arithmetic seem challenging. The experimental approach employed in this study was a quasi-experimental design. A test sheet served as a guide for gathering data for this investigation. Methods of descriptive statistical analysis are used to present research data. The study's findings demonstrate that the experimental group's pretest and posttest scores have gone higher. At the 5% significance level, the t test findings indicate that mathematics use affects third grade primary school kids' multiplication learning outcomes, with a significant value of 0.030, which is less than 0.05.

Keywords: Arithmetic Method; Multiplication Calculation Ability.

Introduction

Education is something that must be condemned by society in order to create individuals who are intellectually rich, intelligent and have character. This is the role of knowledge through excellent education. Education is the main key to creating a quality society and improving human resources. (Yudha 2019). Many factors and factors that exist in education determine the quality of the educational process. These components and elements will create an educational method, which is connected to experiential processes through education. Factors such as good principal leadership, effective teaching and learning processes, having responsibility, teacher participation, staff members who are in the learning environment are the keys to the success of good education (Achmad 2021).

Learning mathematics in a pleasant atmosphere will be more effective, according to (Lestari 2019). By creating a learning atmosphere using strategies that are easy to understand and a comfortable atmosphere, educators can carry out effective learning activities so that the learning process does not seem boring and monotonous. According to (Radinal 2021), education must continue to be adapted to teaching strategies so that the world of education can keep up with the times.

According to (Siregar 2021), an active learning strategy is a learning approach that aims to improve the quality of education and involve students in learning effectively. This strategy includes using learning methods, learning models, as well as using various resources or strengths during the learning process (Siregar 2021). Students, teachers, learning situations, learning

programs, and learning facilities are all factors that can influence learning outcomes (Syaparuddin and Elihami 2020).

Mathematics, also known as arithmetic operations, is the field that studies numbers. But in reality, many people think that mathematics is quite difficult, scary, boring and unpleasant learning. According to (Putri 2023), students think that mathematics is something that is very difficult to understand. Mathematics is a subject that is widely applied, especially in elementary schools. Multiplication is a lesson taught. In elementary school, the aim of learning multiplication is so that students are able to understand the basics, namely repeated addition. The multiplication operation, according to (Hakim, Jamaludin, and Mukhtar 2017), is repeated addition. Students only need to use their fingers to solve multiplication problems.

The ability to count is a very good human ability and is developed by elementary school children from childhood. This ability is very important to master from childhood because counting is so important to use in everyday life (Romlah, Kurniah, and Wembrayarli 2016).

Methods, according to (Ray and Choiriyah 2021), are ways to implement plans in actual operations so that goals are achieved optimally. Appropriate learning methods can increase students' happiness and enthusiasm, increase their enthusiasm, and help teachers convey lesson material. According to (Utami et al. 2018), teaching activities should use methods based on the students' needs and according to the students' character. However, the method used is often ineffective because it does not suit the target or characteristics of the child. In addition, almost all of the approaches used require equipment and sometimes burden the child's memory.

A good method that makes students happy in learning basic arithmetic is Jarimatika. Researchers apply the Jarimatika method to help them solve problems related to multiplication of numbers. By using their fingers, students can easily find out the results of multiplication (Himmah, Asmani, and Nuraini 2021). Therefore, fingers are used to count (Muslihah and Tiawati 2016). The Jarimatika method helps students understand the concept of KaBaTaKu (multiplication, division, addition, subtraction), (Suparni 2018).

The Jarimatika method is proposed because it has been proven in the results of previous research, namely in research conducted by (Chasanah 2019), (Lestari 2019), (Utami 2018), (Afriani, Fardila, and Septian 2019) and (Salsinha, Binsasi, and Bano 2019).

This research was conducted in order to find out how the Jarimatika method can influence third grade students to calculate multiplication during mathematics teaching and learning, especially in the multiplication calculation material. Students use the method, namely Jarimatika, as a tool to help students when working on the given math problems, therefore students can improve their ability to calculate in multiplication material. This research focuses on the use of mathematics in the mathematics learning process. This research was carried out for third grade elementary school students who were less able to solve questions on multiplication in numbers and the teacher used a monotonous and less creative approach in teaching. As a result, students feel learning mathematics is boring and difficult.

Literature Review

Research entitled "Improving numeracy skills using the Jarimatika Method at Nenonbat State Elementary School (SDN), East Nusa Tenggara" by (Salsinha, Binsasi, and Bano 2019). This research aims to improve the numeracy skills of students at SDN Nenonbat Kefamenanu. With mathematics that does not require teaching aids and only uses fingers, it is hoped that learning will be easier to understand, make students happy and not burden students' brain memory. This research has a positive impact on student learning outcomes, as can be seen from the average score on the pre-test of 55.48 to 75 on the post-test. This shows that this research has an influence on students. What this research has in common with the author's research is that they both look for a causal

relationship or the influence of the Jarimatics method on students' numeracy skills. As for the differences, this research was conducted in a high class while the author conducted it in a low class.

Research entitled "Using the Jarimatika Dakam Method to Improve Multiplication Counting Skills in Elementary School Students" by (Afriani, Fardila, and Septian 2019). This research aims to determine the achievement and improvement of multiplication counting skills using the drill and Jarimatika methods. with a population of all grade III students at SD Markaya 1 Karawang. The results of the test data are the average where the significant value is 0.059. A number greater than a means that it is proven that the finger method can improve arithmetic skills compared to the drill method. What this research has in common with the author's research is that they are both looking for a cause and effect relationship or the influence of the finger method on students' numeracy skills and the population is both students from class III.

In the results of (Lestari 2019) is research, the influence of the Jarimatika method on the learning motivation of class IV students at SDN 1 Ngestirahayu, namely. Based on the results of data analysis, the researcher determined the Sig value in the independent sample Ttest. (both parties) $0.007 < 0.05$, then the hypothesis proposed by the researchers in this study was accepted, namely it was concluded that the use of the Jarimatica method had an effect on the learning motivation of class V students at SDN1 Ngestirahayu. What this research has in common with the author's research is that they both look for a cause-and-effect relationship or the influence of the Jarimatics method on students' numeracy skills. As for the differences, this research was conducted in a high class while the author conducted it in a low class.

Method

In this research, the experimental research method uses a quasi-experimental approach. By creating a concept to provide a treatment to the experimental class, such as applying the Jarimatics method, as well as having a control group, such as using lessons that teachers usually use in class. The impact of the learning method treatment was measured in both classes.

Pretest and posttest were used in this research design. The experimental and control groups were divided into two groups, each given a pretest to measure their initial abilities. Then, each group was given learning method treatment and given a posttest to measure their final abilities.

In this research, the subjects were class III elementary school students, consisting of 41 students. In the experimental class there were 19 students, while in the control class there were 22 students. The characteristic of the subject is that students cannot carry out multiplication calculations. The right method for learning is using a method using mathematics to solve problem calculations.

The data in this study was collected through a test which consisted of 30 number multiplication questions. This research uses data analysis techniques, namely, the descriptive analysis method, which displays data using tables, mode, median and mean. Second, prerequisite analysis tests are carried out. This includes normality and homogeneity tests. Third, the hypothesis is tested using the t test formula using SPSS 26 statistics.

Result and Discussion

This research was conducted at UPT Sd Negeri 064965 Jl. Sidodame District Government Complex. East Medan, and the subjects were students in class III. In this research, the data for this research was collected through tests. The test sheet consists of questions that students must answer. Next, the results of student work are tabulated and calculated using predetermined methods or formulas. The hypothesis is proven by research tools, the validity and reliability of which have

been previously tested. Research conducted on how the use of mathematics affects the ability of third grade elementary school students to calculate multiplication obtained the following data.

Pretest Data Description

Pretest Data for Control Group and Experimental Group

The number of students in the control group was 22 students, and the number of students in the experimental group was 19. Pretest data from the control group and experimental group as a whole can be seen in the following table.

Table 1 : Pretest data for control group and experimental group

Control Group		Experimental Group	
Data type	Results	Data Type	Results
The number of students	22	The number of students	19
Total score	1407	Total score	1269
Mean	63.95	Mean	67.32
Median	67	Median	70
Mode	67	Mode	80
Standard deviation	11,017	Standard deviation	13,712
Maximum value	80	Maximum value	87
Minimum value	43	Minimum value	40

Based on the table above, the data shows that as many as 41 students, of which there were 22 in the control group, the highest score was 1407, while the average was 63.95, with a median of 67, the mode was 67, the standard deviation was 11.017, and the highest score was obtained. 80, while the lowest score is 43.

Meanwhile, there were 19 experimental group students, getting a total score of 1269, the average was 67.32, the median was 70, the mode was 80, the standard deviation was 13.712, the highest score was 87, and the lowest score was 40.

Below is a table of classification criteria for the results of the pretest which were obtained from the control class and the experimental class.

Table 2 : Criteria for pretest results for the control group and experimental group

Intervals	Learning Ability Criteria	Control Group Frequency	Experimental Group Frequency
91-100	Very good	0	0
76-90	Good	3	7
61-75	Enough	11	5
46-60	Not enough	7	5
0-45	Fail	1	2
Amount		22	19

Table 2 explains that the criteria for student ability from the 22 students in the control group were 0 students had the criteria for completeness in calculating multiplication which was quite good, 3 people were classified as good, 11 students were classified as quite good, 7 people were classified as poor in the pretest, and 1 student had the criteria fail. Meanwhile, the learning ability criteria for the experimental group of 19 students obtained 0 students had very good multiplication calculation ability criteria, 7 students had good criteria, 5 students had sufficient criteria, 5 students had poor criteria in the pretest, and 2 students had failed criteria. This shows that the students' multiplication ability test results are very poor.

Comparison of Preset Results for Control Group and Experimental Group

The average pretest score for the control group was 63.95, while the average experimental score was 67.32. Data comparison can be seen in the table below.

Table 3 : Comparison of the mean values of the control group and the experimental group

No	Group name	Mean
1	Control group	63.95
2	Experimental group	67.32

The pretest result for the control group was 63.95 and the experimental group was 67.32, each meeting the low criteria. Between the control and experimental classes the average was 3.37. Both classes have less value. There was no significant difference between the two groups classified in the no difference category which indicated that they had the same initial abilities. Therefore, after receiving treatment, these two groups are worthy of comparison.

Posttest Data Description

Posttest Data for Control Group and Experimental Group

The posttest was carried out in the control group with 22 students and 19 students in the experimental class. The complete posttest results of the control group and experimental group are presented in the following table.

Table 4 : Pretest data for control group and experimental group

Control Group		Experimental Group	
Data type	Results	Data Type	Results
The number of students	22	The number of students	19
Total score	1489	Total score	1460
Mean	67.68	Mean	76.84
Median	70	Median	80
Mode	73	Mode	90
Standard deviation	10,772	Standard deviation	15,090
Maximum value	83	Maximum value	97
Minimum value	50	Minimum value	50

Based on the calculations in the table above, a total of 41 students were obtained, with a control group of 22, obtaining a score of 1489, with an average of 67.68, a median of 70, a mode of 73, a standard deviation of 10.772, the highest score was 83, and the lowest score namely 50. Meanwhile, there were 19 experimental group students, the total score was 1460, the average score was 76.84, the median was 80, the mode was 90, the standard deviation was 15.090, the highest score was 97, and the lowest score was 50. When included in the criteria, the following is a classification of the criteria for the pretest results obtained from the control group and the experimental group.

Table 5 : Criteria for posttest results for the control group and experimental group

Intervals	Learning Ability Criteria	Control Group Frequency	Experimental Group Frequency
91-100	Very good	0	3
76-90	Good	6	8
61-75	Enough	9	4
46-60	Not enough	7	4
0-45	Fail	0	0
Amount		22	19

Table 5 above shows that the learning ability criteria of the 22 control group students shows that 0 students are categorized as very good, 6 students are classified as good, 9 meet the adequate category, 7 students meet the criteria as inadequate, and 0 students do not meet the failure criteria. Meanwhile, the learning ability criteria for the experimental group of 19 students showed that 3

students had very good multiplication calculation ability criteria, 8 students had good criteria, 4 students had sufficient criteria, 4 students had poor criteria in the pretest, and 0 students had failed criteria. Of the two groups, there were no students with failure criteria.

Comparison of Preset Results for Control Group and Experimental Group

The average posttest score for the control group was 67.68, which met the predicate of sufficient, and the posttest score for the experimental group was 76.84, which met the predicate of good. This data is presented in the table below.

Table 6 : Comparison of the mean values of the control group and the experimental group

No	Group name	Mean
1	Control group	67.68
2	Experimental group	76.84

Based on the table above, the average difference obtained by the control group and the experimental group is 9.16.

Comparison of Preset Results for Control Group and Experimental Group

The pretest and posttest results for each group were compared to determine the differences in scores before and after treatment. Comparison of pretest and posttest results between the experimental and control groups can be seen in the table below.

Table 7 : Comparison of the mean values of the control group and the experimental group

No	Group name	Average	
		Pretest	Posttest
1	Control group	63.95	67.68
2	Experimental group	67.32	76.84

Based on the table above, the control group's pretest average data was 63.95 and the experimental group obtained an average of 67.32, indicating a deficient predicate on the same criteria, namely a deficient predicate. Meanwhile, the posttest data for the control and experimental groups showed average learning outcomes of 67.68 and 76.84. Both the experimental and control groups showed different improvements. The control group's score of 3.73 increased on average from 62.95 to 67.68 and the experimental group's score of 9.52 increased on average from 67.32 to 76.84. The multiplication ability of the experimental group was 9.52 points higher than the control group's 3.73 points. This shows that the multiplication ability of grade III elementary school students is thought to be more influenced by using Jarimatika.

Hypothesis Test Posttest Results

Table 8 : Test the hypothesis of posttest results with the "t" test

Independent Samples Test

Levene's Test for Equality of Variances		t-test for Equality of Means	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper

Numeracy Ability Results	Equal variances assumed	3,468	0.070	2,259	39	0.030	9,160	4,054	0.960	17,361
	Equal variances not assumed			2,205	32,015	0.035	9,160	4,154	0.698	17,622

Table 8 above gets the sig value. Data sig(2-tailed) $0.030 < 0.05$ and $0.035 < 0.05$. Measured by the significance value of the two variables $0.030 < 0.05$ and $0.035 < 0.05$. It can be concluded that the Jarimatika variable (X) of 0.05 has an influence on students' numeracy skills (Y). Because, in making decisions regarding the analysis of the test, a difference value with sig < 0.05 will be effective. Carrying out this test allows us to conclude that the method used, namely Jarimatika, has quite a significant influence on students' multiplication calculation skills.

Based on the results of the processed data and analysis of the data that has been collected in this research and testing using the t test, a Sig value was obtained. (2-tailed) namely $0.030 < 0.05$ therefore according to the principle in making a decision in the t test namely H_a is accepted which influences or has an influence on the numeracy skills of class III UPT SD Negeri 064965. From the results of data analysis it shows that the average The average numeracy ability in the experimental class was 76.84. Meanwhile, the average numeracy ability of students in the control group was 67.91, therefore a conclusion was drawn, namely that the Jarimatika method used had an impact on students' ability to calculate multiplication.

This is proven by the results of research conducted by (Afriani et al. 2019) with the title "Using the Jarimatika Dakam Method to Improve Multiplication Skills in Elementary School Students". This research aims to determine the acquisition and improvement of multiplication skills. using training methods and Jarimatika with a population of all class III students at SD Markaya 1 Karawang. The data test results are in the form of a mean value where the significance value is 0.059. The numbers are greater than the average, there is evidence that the finger method can improve counting skills compared to the drill method. Therefore, the researcher can conclude that the hypothesis proposed by the researcher in this study is accepted, namely that there is an influence of using the Jarimatika method on the numeracy skills of class III students at SD Markaya 1 Karawang.

There are several historical studies in this research, such as research conducted by (Sumirat, Trimurtini, and Wahyuningsih 2016) and (Sitio 2017) and (Tarigan and Nst 2014), which can be a basis for producing new research. The results showed that low level students' multiplication abilities were influenced by the use of mathematics in relation to learning methods. Class II students at SD Gugus Jogonegoro, Selomerto District, class I students at SDN 003 Pagaran Tapah Darussalam, Rokan Hulu Regency and class II students at SD Negeri 101774 Sampali Percut Sei Tuan showed a greater influence in the use of mathematics learning in the methodology survey. However, new research shows that this technique also works for students in lower grades.

This theory is proven based on the results of research conducted at UPT Sd Negeri 064965. It can be explained that finger mating can be used as a method of increasing abilities so that they are more enthusiastic and proactive in studying more actively. Therefore, it means that students are able to count using the Jarimatika method. Therefore, a conclusion was drawn, namely the influence of the Jarimatics method on the multiplication skills of class III students at UPT State Elementary School 064965.

Conclusion

The results of the research and discussion concluded that students' mathematical thinking abilities had improved in calculating multiplication. Students' ability to calculate multiplication

without using the finger method also increased, with a pretest score of 67.32 and a posttest of 76.84. However, there are still some of them who are below average, namely with a pretest score of 63.95 and a posttest average of 67.68. However, a two-tailed significance value of 0.030 was found after a statistical test with a significance level of 5% (95% confidence value). The significance value of 0.030 is lower than 0.05, according to the t test analysis of posttest data. Therefore, it can be concluded that the Jarimatics method has a very significant impact on the knowledge of how to count in class III elementary school students in multiplication material.

The existence of a significant influence on students in calculating multiplication shows that mathematics can be used as a way to improve students' ability to solve integer multiplication problems and make learning more fun. It must be more interesting by using many different methods.

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