

Use Of Jarimatics Method In Improving Primary School Students' Numerical Abilities

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Abstrak

Studi ini bertujuan untuk mengetahui kontribusi penggunaan metode jarimatika untuk meningkatkan kemampuan numerik siswa. Penelitian merupakan penelitian kuantitatif eksperiment dengan desain penelitian Quasi Eksperiment Design atau penelitian semu. Penelitian ini dilakukan di salah satu sekolah di Kabupaten Bima Nusa Tenggara Barat Indonesia. Sampel dalam penelitian terdiri dari 35 siswa yang diambil semua dari jumlah populasi. Instrumen dalam penelitian menggunakan tes pilihan ganda dan esai. Teknik analisis data menggunakan regresi linear sederhana dan uji t. Hasil penelitian ini menunjukkan bahwa menunjukkan nilai Paired-Sampel T-test sebesar -12,887 dan t_{tabel} sebesar -1,753 dengan taraf signifikansi 5%, sehingga $-26.88 > -1,753$ atau $-26.88 < -1,753$ yang berarti dapat terdapat kontribusi penggunaan metode jarimatika untuk meningkatkan kemampuan numerik siswa, dengan besar kontribusi metode jarimatika sebesar 66.6%.

Kata Kunci: Kontribusi, Metode Jarimatika, Kemampuan Numerik

Abstract

This study aims to determine the contribution of using the Jarimatika method to improve students' numerical abilities. This research is an experimental quantitative research with a Quasi Experiment Design research design or quasi-research. This research was conducted in a school in Bima Regency, West Nusa Tenggara, Indonesia. The sample in the study consisted of 35 students who were all taken from the total population. Instruments in the study using multiple choice tests and essays. The data analysis technique used simple linear regression and t test. The results of this study indicate that the Paired-Sample T-test value is -12.887 and table is -1.753 with a significance level of 5%, so $-26.88 > -1.753$ or $-26.88 < -1.753$ which means that there can be a contribution using the Jarimatika method to improve students' numerical ability, with a large contribution of the Jarimatika method of 66.6%.

Keywords : Contribution, Jarimatika Method, Numerical Ability

INTRODUCTION

Numerical ability is one of the abilities in mathematics. This ability is very important for every student to train in learning mathematics. In fact, students are advised to practice their numerical skills since kindergarten (Huda et al., 2020), because with numerical skills students will more quickly understand and analyze every mathematical problem so that students do not experience difficulties in learning mathematics. If studied more deeply, numerical ability is a student's understanding and carrying out number calculation operations in solving various mathematical problems (Plaikoil et al., 2019). Each student has different abilities, some are high, medium and low. Students who have higher abilities

will usually understand number patterns better and have very good mathematical reasoning (Salim, Masi L, Fauziah, 2020).

Basically, numerical ability is an ability that God has given to every individual. This ability has been present since birth in every individual, it's just that every individual has to practice to improve their numerical ability. Numerical ability is closely related to numbers and students' speed in calculating (Huda et al., 2020). To achieve higher numerical abilities, students must practice regularly and continuously their numerical abilities. In fact, students have to look for/try various ways so that their numeracy skills can be faster in calculating numbers (Sumada, Dantes, & Pudjawan, 2013; Astuti, Marhaeni, & Sariyasa, 2013). Solving mathematical problems requires improving students' accuracy and better numerical abilities (Suharti et al. 2018; Munifah et al., 2019; Salim et al, 2020).

Numerical ability or skill is one of the skills that is the focus point in the NCTM standards, which includes: understanding numeric and counting systems, the concept of number operations, numbers and numerical relationships, number theory, calculation and estimation. These standards in the field of numbers and operations aim to enable students to understand numbers and methods of representation and the relationship between numbers and numerical systems, to understand the meaning of operations and how they relate to each other, and to facilitate calculations and work on reasonable estimates. (Abed et al., 2015; Niklas et al., 2016).

Several researchers state that students must and need to have numerical abilities. (Munifah et al., 2019; Huda et al., 2020) emphasized that it is necessary for students to have good numerical skills, because with numerical abilities, students will more quickly understand, analyze and apply students' mathematical concepts. Meanwhile, Ludewig et al., (2020) also revealed that students' numerical abilities are very helpful for students in solving graph problems and reading graphs. Furthermore, Ndiung (2020) in his research stated that with numerical abilities students will find it easier to solve mathematical problems.

From the explanation above, it can be said that numerical ability is very important and must be possessed by students, however there are several studies which reveal that students' numerical ability is still relatively low, as quoted in research by Salim et al (2020) which revealed that both male and female students In one school in Indonesia, the numerical ability is in the low category. Likewise, in research by Kadir, Sudia, Rasmuin, & Ismailmuza, (2019) which revealed that there were still students with low numerical abilities, these students found it difficult to solve mathematical problems in the form of story problems. In line with that, Malenda, Kadir, & Suhar, (2018) also revealed that 98.94% of the sample in their research had numerical abilities in the low category.

Furthermore, the researchers also conducted an interview with one of the mathematics teachers at one of the schools in the district. Bima explained that students' ability to calculate in mathematics learning is still lacking, especially in multiplication and division, which results in students often experiencing delays in solving mathematics problems in various subjects. To overcome this problem, teachers usually ask students to memorize, but this method does not too effective. We can see this from the average student score which shows that there are still students who have not reached the minimum standard of learning completion, namely 65.00..

Based on the above, of course there must be efforts to improve students' numerical abilities, one of the efforts is to apply methods. One method of learning mathematics is the Jarimatika method. The Jarimatika method is a method of counting using fingers (Sukardi, 2019; Muslihah & Tiawati, 2020). Counting using the finger method is more practical and efficient, and students will understand the method more easily (Hendayanti et al., 2021; Bete, 2021). In the implementation of learning, the Jarimatics method is widely used by teachers so that in conveying material on arithmetic operations such as multiplication, division, subtraction and addition, students will also be able to easily solve calculation problems using their fingers (Panggarra & Trivena, 2021).

Jarimatika basically comes from two words, namely: fingers and arithmetic, which means counting with the fingers. The Jarimatika method has several advantages, such as students don't need to buy tools, students are not afraid of losing or forgetting their tools or having them confiscated at school, students can easily do calculations because it doesn't burden the students' brains, it can develop students' left and right brains, so they can work optimally and can speed things up. students' numeracy process (Saputra, 2012; Apreasta & Burhan, 2020; Himmah et al., 2021). Apart from that, another advantage of the Jarimatika method is that it will foster students' interest in learning, so that students are more motivated in learning (Masruni, 2016; Lanya et al., 2020; Dewi et al., 2020).

Several researchers have conducted research related to the Jarimatika method, such as research by Himmah et al., (2021) entitled "Effectiveness of the Jarimatika Method in Improving Students' Multiplication Counting Ability". The results of this research show that the effectiveness of the results can be seen after the teacher uses the mathematical method, students can complete multiplication calculations correctly. Furthermore, the same research by Dewi et al., (2020) and Bete, (2021) is entitled "The Influence of the Jarimatika Method on Multiplication Learning Outcomes of Elementary School Students". The results of his research prove that there is a significant influence of the use of the Jarimatics method on students' multiplication learning outcomes. Further research. Furthermore, Muslihah & Tiawati's (2020) research entitled "Analysis of the Magic Finger Method (Jarimatica) in Improving Students' Multiplication Counting Ability and Learning Motivation" the results of their research show that students' mathematics learning outcomes using the Jarimatika method are classified as very good. And research by Afriani et al., (2019) entitled "Use of the Jarimatika Method in Improving Multiplication Calculation Skills in Elementary School Students" and there are many other studies related to the Jarimatika method.

Of the many studies above, not one study has examined the use of the mathematical method to improve students' numerical abilities. Previous researchers only focused on the use of the Jarimatics method on multiplication calculation skills only. However, in this study the researcher made efforts to improve students' numerical abilities, which are more than just the ability to calculate multiplication, but include scope, addition, subtraction, multiplication, division, and understanding of mathematics using the mathematical method.

METOD

The research aims to determine the contribution of using the Jarimatics method to improve students' numerical abilities. The research is quantitative experimental research with a Quasi Experimental Research design or quasi-research. This research was conducted at SDN Tolonggeru Donggo, Bima Regency, West Nusa Tenggara, Indonesia. The sample in

the study consisted of 35 students taken from the total population who took classes using the Jarimatika method. The instruments in the research used multiple choice tests and essays by experts. The multiple choice test consists of 10 and 5 number tests adopted from elementary school mathematics books. Next, the test questions are validated by an expert validator. Data analysis techniques use simple regression and t test. The research design can be seen in Table 1.

Tabel 1. Research design

O1	X	O2
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Information:

O1 = Pretest score (before treatment is given)

X = Receiving treatment

O2 = Posttest score (after being given treatment)

RESULTS AND DISCUSSION

Result

In this research, researchers conducted an initial test or pre-test on the research sample. To measure their numerical abilities before learning using the Jarimatika method. The following is a presentation of data on students' initial test scores or pre-tests.

Tabel 2: Pre-Test Score of Students' Numerical Ability

	N	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Pre_Test	35	23	71	1725	49.29	12.239	149.798
Valid N	35						

From Table 2 above, it shows that the pre-test descriptive statistical value of the student's numerical ability value. The results in Table 2 show that the mean value is 49.29; variance of 149,798; standard deviation of 12,239; The minimum value is 23 and the maximum value is 71.

After the pre-test was carried out, the researcher then carried out learning with treatment using the Jarimatika method. Learning using the Jarimatika method was carried out in 6 meetings over 2 weeks following mathematics lesson hours. After the lesson using the Jarimatika method was completed, the researcher conducted a post test to determine whether there had been an increase in students' numerical abilities. The following are the post test scores for students' numerical abilities.

Tabel 3: Post Test Scores for Students' Numerical Ability

	N	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Pre_Test	35	71	98	2916	83.31	7.522	56.575
Valid N	35						

From Table 3 above, it shows that the post-test descriptive statistical value of the students' numerical ability scores. The results in Table 3 show that the mean value is 83.31; variance of 56,575; standard deviation of 7.522; The minimum value is 71 and the maximum value is 98.

To be more specific, the researcher carried out a simple regression test and a Related Sample t-test. This was done by researchers to see how big a contribution the use of the Jarimatics method makes to improving students' numerical understanding results. Before carrying out the simple regression test and the Related Sample t-test, a normality and homogeneity test will be carried out from the data that has been obtained. The results of the Normality and Homogeneity tests can be seen in Table 4 and Table 5.

Tabel 4. Data Normality Test

	<i>Kolmogorov-Smirnov</i>		
	<i>Statistic</i>	<i>df</i>	<i>Sig.</i>
<i>Pre_Test</i>	0.076	35	0.200
<i>Post_Test</i>	0.092	35	0.200

Tabel 3. Data Homogeneity Test

	<i>Sum of Squares</i>	<i>Sig.</i>
<i>Between Groups</i>	20264.014	0.460
<i>Within Groups</i>	7016.686	
<i>Total</i>	27280.700	

The data normality test is seen in Table 4 above. In the table it can be seen that the sig value. in the pre-test and post-test columns is 0.200. A sig value of 0.200 indicates that the sig value is >0.05, which means that the data resulting from students' numerical abilities is normally distributed. While the data homogeneity test can be seen in Table 5, the table also shows that the sig value is 0.460. The sig value of 0.460 indicates that the sig value is >0.05, which means that the data on the results of students' numerical abilities varies. Based on the results of the normality and homogeneity test of the data, the data from the student comprehension test can be analyzed using parametric statistical tests. Simple regression test data and Related Sample t-test can be seen in Table 6 and Table 7.

Tabel 6. Related Sample t-Test Results

<i>Paired Differences</i>					
Rata-rata	Standar deviasi	Standar kesalahan	T	df	
-34.029	7.489	1.266	-26,88	34	

Based on the results of the t-Sample Related in Table 4, it can be shown that the t-test / tcount value for students' numerical abilities is -26.88 with a df of 34. Furthermore, based on the df value of 34, the ttable value is -1.753 (see Table t- test) with a significance level of 5%. Because the t-test or tcount value is -26.88 and ttable is -1.753, mathematically it

shows that $t_{count} > t_{table}$ or $-26.88 > -1.753$ which means that there is a contribution from the use of the mathematical method to increasing students' numerical abilities.

Tabel 7. Simple Regression Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.816 ^a	.666	.656	4.411

Tabel 8. Simple Linear Regression Coefficient Value of Students' Numerical Understanding Value

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	58.591	3.136	
	Pre_Test	.502	.062	.816

Table 7 shows an R value of 0.816 and an R Square value of 0.666. This shows that there is a contribution from the use of the Jarimatics method in improving students' numerical abilities by 66.6%. while the other side is influenced by other factors not examined in this study. Table 8 shows the simple linear regression coefficient value of $Y=58.591+0.502x$.

Discussion

Numerical ability is one of the abilities in mathematics. This ability is very important for every student to train in learning mathematics. In fact, students are advised to practice their numerical skills from an early age, because with numerical skills students will more quickly understand and analyze every mathematical problem so that students do not experience difficulties in learning mathematics. If studied more deeply, numerical ability is a student's ability to understand and carry out number calculation operations in solving various mathematical problems. The Jarimatika method is the right method to improve students' numerical abilities. The use of the Jarimatics method in research succeeded in improving students' abilities. These results show that the use of the mathematics method can help students in learning mathematics so that students can improve their numerical abilities. Using the Jarimatika method will help students improve their numeracy skills and help solve mathematical problems. This finding is in line with the research results of Panggarra & Trivena (2021) which found that learning using the Jarimatics method could improve students' numeracy skills.

Furthermore, this research aims to see the contribution of using the mathematical method in improving students' numerical abilities. The findings in this research reveal that there is a contribution from the use of the Jarimatical method in improving numerical abilities. Increasing students' learning abilities cannot be separated from the contribution of using the Jarmatics method applied in learning, while the contribution from factors such as teacher strategies in teaching, teacher professionalism, teacher relationships with students, etc., is only a small part. These results are in accordance with research. In line with this, Bete (2021) also stated that there is a significant influence of the use of the Jarimatics method on students' numeracy learning outcomes. This research also reveals that there is a positive relationship between the use of the mathematics method and the binding of

students' numerical ability scores. In line with that, research also reveals that the use of the Jarimatics method can attract students' attention, so that students are motivated to demonstrate the Jarimatical method when they count.

From the descriptions above, it can be explained that the use of the mathematical method can improve students' numerical abilities. This is in accordance with the data which states that the Jarimatics method has a positive contribution to the use of the Jarimatics method in improving students' numerical abilities. This research illustrates that after the teacher uses the Jarimatics method, students can complete calculations correctly. Students no longer experience obstacles in calculating multiplication so they get good grades (Himmah et al., (2021). In line with this research, Al Musthafa & Mandailina (2018) in their research also stated that Jarimatika training is very useful and helps in improving students' numeracy skills. Idham Sumirat, Trimurtini, (2017) in his research revealed that there was a positive influence of applying Jarimatics practices on multiplication calculation skills in class II elementary school students.

The application of the Jarimatics method in mathematics learning can not only improve student learning outcomes, but can also make students feel more active and make students happy so that students can understand what the teacher is saying. Elita (2012); Mariyati & Nursina, (2017); Sitio (2017) in his research revealed that learning by applying the Jarimatics method will increase students' ability to perform multiplication operations on natural numbers, because by applying the Jarimatical method students are much more active than before. Apart from that, the application of the Jarimatics method makes students happy and quickly understand what the teacher is saying.

CONCLUSION

In learning mathematics, it is very important to use various learning methods, one of which is using the Jarimatics method. Based on the results of data analysis, it can be concluded that there is a positive contribution from using the Jarimatical method in improving students' numerical abilities. The use of the Jarimatics method can improve students' numerical abilities. The Jarimatika method is very effective in training students' numeracy skills, by using the Jarimatika method students no longer look for tools/media for counting. The use of the mathematical method in learning mathematics really attracts students' attention, so that students are much more active than before. Apart from using the Jarimatics method, it will make students feel happy with what the teacher conveys in learning to count so that students quickly understand mathematics learning.

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