THE EFFECT OF THE USE OF THE JARIMATICS METHOD ON THE RESULTS OF LEARNING MULTIPURPOSE ORIGINAL NUMBER IN CLASS IV STUDENTS SDN 06 TAPA BONE BOLANGO

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ABSTRACT

This study aims to determine whether there is an effect of the use of the Jarimatika method on the Learning Outcomes of Multiplication of Natural Numbers in Grade 4 Students of SDN 06 Tapa, Bone Bolango Regency. This type of research is a descriptive quantitative study with a pre-experimental one group pre-test - post-test design. The data collection instruments used by the researchers in this study were observation, tests and documentation.

The results showed that tcount = 3.916 and ttable = 2.069. Thus tcount> ttable means HO is rejected and Ha is accepted. Based on the results of the research obtained, it was concluded that there was an effect of using the Jarimatika method on the Learning Outcomes of Multiplication of Natural Numbers in Grade 4 Students at SDN 06 Tapa, Bone Bolango Regency. .94) and after using the Jarimatika method, the average student learning outcomes (82.71). In this case the average student learning outcomes using the Jarimatika method are higher than the average student learning outcomes before using the Jarimatika method, meaning that the use of the Jarimatika method on Learning Outcomes of Multiplication of Natural Numbers in Grade 4 Students at SDN 06 Tapa, Bone Bolango Regency can affect learning outcomes. student.

Keywords: Learning Outcomes, Multiplication, Natural Numbers.

INTRODUCTION

Teaching is essentially a process, namely the process of regulating, organizing the environment around students so that they can grow and encourage students to carry out the learning process. Teachers must design and prepare an interesting learning process so that students are able to follow the learning process well and do not feel bored. One of them is by choosing the right learning model and media so that the learning objectives can be expected to be achieved.

In the development of life in today's era of globalization, someone who does not have the ability to calculate will find it difficult to face increasingly fierce and competitive competition to be able to get a decent life. In everyday life there are many problems that cannot be solved without going through mathematical calculations. Therefore, the ability to calculate is a fundamental foundation that a person must have to fulfill his life needs. Apart from being a tool to meet the needs of daily life, the ability to count can also train the ability to think critically, systematically, logically and creatively. For the ability to calculate mathematically in reasoning, thinking or expressing an opinion, it should not be arbitrary but must go through the right understanding. Accuracy and accuracy are traits that are closely attached to mathematics. Likewise, in calculating mathematically, it can train the ability to concentrate, which is strong and structured. All of these counting abilities really need to be trained so that they become habits in acting to solve life's problems.

Paying attention to the role of the ability to count as described above, shows how important it is to develop the ability to count in learning at school. Therefore, in learning at school the ability to count begins to be developed in grade 1 elementary school even since students start entering early childhood education. One thing to note here is that the ability to count is a structured and well-organized knowledge, so students who lack knowledge of numeracy in elementary school will find it difficult to develop their numeracy skills at the next level of education. The government must pay attention to and facilitate every need that exists in schools, and for the community they must also approach students outside of school, and for the researchers themselves we have to make them smart because they are the next generation of the nation.

So it needs a new breakthrough in teaching and learning, one of which is applying the Jarimatika method. Jarimatika is an easy and fun way of calculating math using our own fingers. By using the Jarimatika method, it is hoped that it can help overcome the concentration of student learning.

Understanding Natural Numbers
natural numbers are positive integers that are not zero. Or it can also be interpreted that natural numbers are positive numbers starting from one to the top.

1. Example of a set of natural numbers
In the following for simplicity, we will give a detailed example for natural numbers. Take a look at the following examples!

Image: Natural numbers

2. An example of a general set of natural numbers
A   =   {   1,   2,   3,   4,   5,   6,   7,   8,   9,   10,   11, ...   }
This means that the natural numbers are one, two, three, four and so on to infinity.

3. Examples of natural numbers less than 10
A = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }
This means that the set of natural numbers less than 10 is from one to nine.

4. Example of a set of natural numbers less than 15
A = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 }
This means that the set of natural numbers less than 17 is from 1 to fourteen.
4. Example of the set of natural numbers less than 7-
A = { 1, 2, 3, 4, 5, 6 }
This means that the set of natural numbers less than seven is from one to six

5. Example of the set of natural numbers less than 6
A = { 1, 2, 3, 4, 5 }
This means that the set of natural numbers less than six starts from one to five.

6. Example of a set of natural numbers between 1 and 10

A = { 2, 3, 4, 5, 6, 7, 8, 9 }

This means that the natural numbers between 1 and 10 are from two to nine.

7. Example of the set of natural numbers between 8 and 9A = { }

This means that the natural numbers between eight and nine are non-existent.

8. Example of a set of natural numbers between 5 and 15

A = { 6, 7, 8, 9, 10, 11, 12, 13, 14 }

This means that the set of natural numbers between five and fifteen is from six to fourteen.

9.Example of the set of natural numbers between 4 and 10

A = { 5, 6, 7, 8, 9)

The point is that the set of natural numbers between 4 and 10 is from six to nine.

10. Example of the set of natural numbers between 10 and 50 which are divisible by 4

A = { 12, 16, 20, 24, 28, 32, 36, 40, 44, 48 }

Multiplication Operation of Natural Numbers

Multiplication is the mathematical operation of multiplying one number by another. This operation is one of the four basic operations in basic arithmetic (the others are addition, subtraction, division). Multiplication is defined for all numbers in terms of repeated addition: for example, 3 times 4 (often read "3 times 4") can be calculated by adding 3 copies of 4 together:

$3 \times 4 = 4 + 4 + 4 = 12$

Another example

:

1) $5 \times 3 = 3 + 3 + 3 + 3 + 3 = 15$

2) $7 \times 5 = 5 + 5 + 5 + 5 + 5 + 5 + 5 = 35$

3) $4 \times 11 = 11 + 11 + 11 + 11 = 44$

Concept of Multiplication of Natural Numbers

Multiplication as repeated addition

Example:

$8 \times 6 = 6+6+6+6+6+6+6+6$

$= 48$

$7 \times 9 = 9+9+9+9+9+9+9$

$= 63$

1. The nature of multiplication$a \times 1 = a$, $a \neq 0$

a. $a \times 0 = 0$

b. $a \times b = b \times a$

c. $(a \times b) \times c = a \times (b \times c)$

Example:

a. $6 \times 1 = 6$

b. $8 \times 0 = 0$

c. $8 \times 6 = 6 \times 8$

d. $(6 \times 8) \times 10 = 6 \times (8 \times 10)$

= 6 x 80
   = 480

2. Multiplication Arithmetic that produces a three-digit number

Multiplication with short stack

Example:

146
3
x —
438

Multiplication with long stack

Example:

26
18
x —
208
26
+ —
468

Basic Facts of Multiplication of Natural Numbers Multiply Numbers

Multiplication is basic knowledge in arithmetic. Multiplication is a mathematical operation that multiplies a number by another number so as to produce a certain definite value and is a mathematical operation of scaling a number with another number. Multiplication is often seen as a specialty of addition, where all additions are the same. Multiplication operations on whole numbers are defined as repeated additions. So to understand the concept of multiplication, children must understand and be skilled at performing addition operations. The multiplication of a x b is defined as the addition of the number b a times. So a x b = b + b + b + b +...+ b. And multiplication is the product of two numbers a and b is c, so a x b = c.

While the basic multiplication is the multiplication of two numbers, each of which is one number such as 6 x 6, 5 x 7, and so on. And the basic multiplication that must be memorized by elementary school children is the multiplication of the numbers 1 to 10.

Example   : 6 x 8 = 48
               4 x 3 = 12
               5 x 9 = 45
               7 x 8 = 56

Multiplication Table

X	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Jarimatika method
Definition of Jarimatika

Jarimatika stands for finger and arithmetic or can be known as magic finger. Jarimatika is an easy and fun way of calculating math using our own fingers. According to Wulandari (2005:17) Jarimatika is a way of calculating the operation times-for-plus-subtract using the fingers. The multiplication used is the basic multiplication whose product is below 100. And the multiplication of arithmetic starts from the numbers 6 to 10, the multiplication of the numbers 1, 2, 3, 4, and 5 still has to be memorized. Although only using hands but with this method we are able to perform various arithmetic operations. As an illustration, the little finger has a value of 6, the ring finger has a value of 7, the middle finger has a value of 8, the index finger has a value of 9, and the thumb has a value of 10. The following is the format of the magic finger base number 6-10.
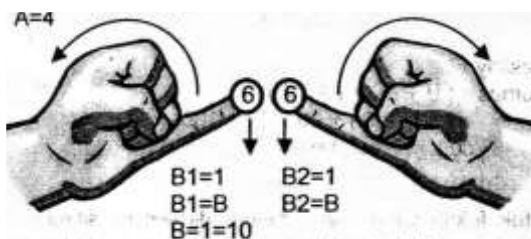

Figure 2.1 Magic finger

How to Use Jarimatika
Jarimatika formula:

Rumus: (P + P) + (S x S)

Information :
1) The flick finger value is 6
2) Ring finger is 7
3) Middle finger value is 8
4) The index finger is 9
5) Thumb is 10
6) P= Tens
7) S= Unit

The following is how to multiply numbers from 6 to 10. Exercise 1. For example, if there is a 6 X 6 problem, the way to calculate it is:
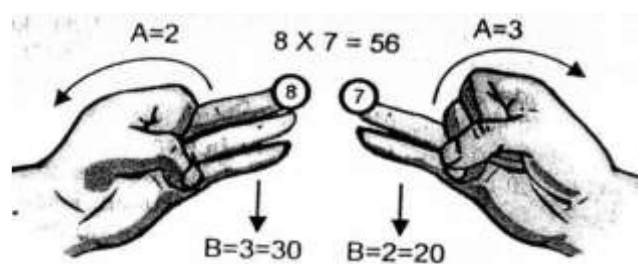

1) We open the right and left little fingers, the others close.
2) The finger that opens is in tens and the one that closes is in units.
3) Fingers that open are added. If the one who opens the little finger then the value is 10, so 10 + 10 = 20.
4) Fingers that close at times. The right covers 4 and the left is also 4, so 4 x 4 = 16.
5) The result, 20 + 16 = 36. So 6 x 6 = 36.
Exercise 2. For multiplication of 7 x 7, how to calculate it is:
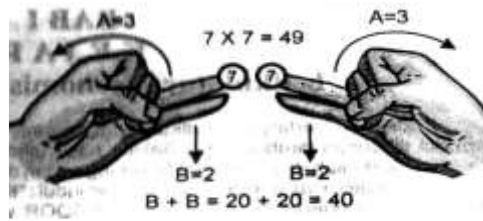
1) Our right hand opens the little finger and ring finger, our left hand opens the little finger and ring finger

2) The finger that opens the right is 20 while the left is 20 so 20 +20 = 40

3) The finger that covers the right 3 is the left 3. So 3 x 3 = 9

4) The result is 40 + 9 = 49. So 7 x 7 = 49

Exercise 3. Multiply 8 x 7 how to calculate it is:

1) Our right hand opens the little finger, ring finger, and middle finger. Left hand we open the little finger and ring finger.

2) The finger that opens the right is 30 while the left is 20 so 30 + 20 = 50.

3) Fingers that cover the right 2 the left 3. So

2 x 3= 6

4) The result is 50 + 6 = 56. So 8 x 7 = 56.

The advantages and disadvantages of Jarimatika

1. Advantages of Jarimatika

According to Wulandari (2005: 17)

a) Provide visualization in the process of counting and delight children when used.

 b) Does not burden the memory of the brain because it does not need to memorize

 c) The way of delivery is fun by balancing and optimizing the left and right brain.

 d) Learning does not require tools and does not need to memorize.

2. Lack of Jarimatika

a) It takes a long time to reach a higher level.

 b) Not all multiplications can be solved with a magic finger.

 c) It takes a lot of patience to learn it

Learning and Learning Outcomes

Understanding Learning

Learning is a word that is familiar to all levels of society. For students the word "learning" is a familiar word. In fact, it is an inseparable part of all their activities in studying in formal institutions. According to Dimyati and Mudjiyono (2013) explained that learning is the occurrence of mental changes in students. According to Skiner (Dimyati and Mudjiyono) learning is a behavior when people learn, so the response becomes better. Meanwhile, according to Piaget (Dimyati and Mudjiyono) learning is a process to acquire knowledge.

According to Piaget, knowledge is acquired by individuals. Individuals interact continuously with the environment, with the interaction with the environment, the intellectual function is growing.

Learning outcomes

According to Dimyati and Mudjiono (2009: 200) stated that learning outcomes are the level of success obtained by students after participating in a learning activity that is marked with a value. Meanwhile, according to Djamarah (2002.20) learning outcomes are essentially changes that occur within a person after the end of learning activities.

Learning outcomes are changes in behavior which of course are very difficult to be able to reveal all these changes. And to be able to express and measure data about learning outcomes, Benjamin S. Bloom divides 3 aspects of learning outcomes, namely cognitive, affective, and psychomotor aspects.

1. Cognitive Learning Outcomes

Cognitive aspects are aspects related to the ability to think. The cognitive aspect consists of six levels or levels of ability, namely: memory or knowledge (knowledge), understanding (comprehension), application (application), analysis (analysis), synthesis (synthesis), evaluation (evaluation).

2. Affective Learning Outcomes

Affective learning outcomes are learning outcomes related to interests, attitudes, and values. Affective learning outcomes consist of 5 levels, namely: acceptance (attending), response (responding), appreciation (valuing), setting (organization), and characterization (characterization).

3. Psychomotor Learning Outcomes

According to Nana Sudjana (2002: 30) psychomotor learning outcomes are learning outcomes related to motor skills and individual acting abilities. Like cognitive and affective learning outcomes, psychomotor learning outcomes are also tiered, namely: mastery of early movements, semi-routine movements, and routine movements

Factors Affecting Learning Outcomes

The learning outcomes achieved by students in schools is one measure of mastery of the subject matter delivered. The role of teachers in delivering subject matter can affect student learning outcomes. The factors that influence student learning outcomes are very important to know, meaning that in order to help students achieve optimal learning outcomes. The factors that influence learning outcomes According to Munadi (Rusman, 2012:124) include internal factors and external factors:

a. Internal factors

Physiological Factors. In general, physiological conditions, such as excellent health, not in a state of tiredness and fatigue, not in a state of physical disability and so on. This can affect students in receiving the subject matter.

Psychological Factors. Each individual, in this case, students basically have different psychological conditions, of course this also affects their learning outcomes. Some psychological factors include intelligence (IQ), attention, interest, talent, motive, motivation, cognitive and reasoning power of students.

b. External Factors

Environmental Factors. Environmental factors can affect learning outcomes. These environmental factors include the physical environment and social environment. The natural environment for example temperature, humidity and others.

Instrumental Factors. Instrumental factors are factors whose existence and use are designed in accordance with the expected learning outcomes. These instrumental factors are:

(1) Teaching method.

(2) Curriculum.

(3) The relationship between teachers and students.

(4) School discipline.

(5) Learning tools.

(6) School time.

(7) Standard lessons above the size.

(8) The condition of the building.

(9) Learning method.

(10) Homework.

Learning strategies

Learning strategies should be your "personality" in carrying out learning and learning activities. So in the cognitive realm students want to be better at mastering subject matter, academic scores and achievement. On the affective and picomotor side, students can make students feel proud and meaningful when studying with you so that students have confidence because they can recognize their "gifted" potential. In the end, as a teacher who can build his spiritual realm, it can be realized by making students strive to be able to provide benefits to the environment and others. So as to produce a culture of researching and creative productive solving problems and providing solutions to the problems of life around it.

According to Ahmadi (2011:9) The teacher's learning strategy chosen by the teacher should be based on various considerations according to the situation, conditions and environment that will be faced. The selection of learning strategies generally starts from:

a. The formulation of the learning objectives that have been set

b. Analysis of the needs and characteristics of the resulting learners

c. Types of learning materials to be communicated

Learning strategy is basically a plan to achieve goals. The terms strategy, method or technique are often used interchangeably although basically, these terms have differences from one another. Learning techniques are often confused with learning methods. According to Geriach and Ely (Ahmadi, 2011:9). Techniques are paths or tools or media used by teachers to direct students' activities towards the goals to be achieved

RESEARCH METHODS

The method used in this research is experimental research. The type of research used in this study is a pre-experimental design method with the type of pre-test and post-test one group design. This method is given to only one group without a comparison group. As for this study, there is only one variable used, namely student learning outcomes against multiplication of natural numbers. In connection with the use of the jarimatika learning method carried out in different learning actions for the two samples studied, the variable is distinguished in two ways, namely the X1 variable, which is the average value of multiplication learning outcomes obtained by students through learning using the Jarimatika learning method. Variable X2 is the average value of multiplication learning outcomes obtained by students through learning that does not use the Jarimatika learning method.

Based on the above understanding, the population of this research is all fourth grade students of SDN 06 Tapa Bone Bolango Regency as many as 17 students, consisting of 8 men and 9 women. Meanwhile, the samples of this study were all fourth grade students at SDN 06 Tapa Kab. Bone Bolango (total sample). Based on the

sample, two independent samples were formed by sampling using random sampling technique. Data collection techniques are the most important step in research, because the main purpose of research is to obtain data (Sugiyono, 2015:375). The data collection techniques used by researchers to collect data are as follows: Observation, Test, Documentation. is intended to obtain data directly from the research site, including relevant books, regulations, activity reports, photographs, documentaries, research-relevant data (Anwar, 2011:58). The data analysis technique of this research was carried out through the following steps:

The hypothesis is formulated into pairs of statistical hypotheses as follows;

Ho : M1 = M2 there is no difference in learning outcomes of multiplication of natural numbers obtained by fourth grade students of SDN 06 Tapa Kab. Bone Bolango which uses the Jarimatika learning method and those who do not use the Jarimatika learning method.

Ha : M1 M2 there are differences in learning outcomes of multiplication of natural numbers obtained by fourth grade students of SDN 06 Tapa Kab. Bone Bolango which uses the Jarimatika learning method and those who do not use the Jarimatika learning method.

Testing Criteria If t count > t table means Ha is accepted and Ho rejects If t count < t table means Ha is rejected and Ho accepts. By level

error at (alpha) = 5 % , where : db/df = (M1 + M2) = 2 If L_hitung<L_table, then H0 is accepted, so it can be concluded that the sample comes from a population that is normally distributed at a significance level of = 5%.

The data obtained in this study were analyzed quantitatively by focusing on the use of the Jarimatika method on the learning outcomes of multiplication of natural numbers in grade 4 students at SDN 06 Tapa, Bone Bolango Regency. mathematics learning. Variable X2 is the average value of multiplication learning outcomes obtained by students through learning that does not use the Jarimatika learning method. The formula used in this study is the Statistical Technique of the t-Test Paired Samples Test with the reason that this study compares the effectiveness of the two methods then the researcher does it by taking both data on the same group of subjects with a certain time interval.

RESEARCH RESULTS AND DISCUSSION

Student learning outcomes before using the Jarimatika method, it can be seen that from a total of 17 students with a total score of 1223, the lowest score was 50 and the highest score was 85. The average is 71.94, the median is 72 and the mode is 70. Then based on the results of the calculation of normality testing for student learning outcomes before using the Jarimatika method using the SPSS software version 18.0 Kolmogorov-Smirnova data with a statistical level at alpha 0.05, L_hitung of 0.1490 with a sample of 17, significant level 0.05, then obtained L_table = 0.1798, thus L_hitung≤L_table(0.1490 0.1789). The test criteria state that, Accept H0 if: L_hitung≤L_table on = 0.05; n = 17. So it can be concluded that the data before using the Jarimatika method was normally distributed.

Student learning outcomes after using the Jarimatika method, it can be seen that from a total of 17 students with a total of 1406 and the lowest score is 74 and the highest score is 97. The average is 82.71, the median is 81 and the mode is 77. Then from the results of the calculation of normality testing for student learning outcomes after using the Jarimatika method using the SPSS software version 18.0 Kolmogorov-Smirnova data with a statistical level at alpha 0.05, obtained L_count of 0.1020 with a sample size of 17, significant level 0.05, then obtained L_table = 0.1798, thus L_hitung≤L_table(0,1020 0.1789). The test criteria state that, Accept H0 if: L_hitung≤L_table on = 0.05; n = 17. So it can be concluded that the data after using the Jarimatika method is normally distributed.

At the beginning, it was discussed that the purpose of this study was to determine the effectiveness of the use of the Jarimatika method on learning outcomes of multiplication of natural numbers in grade 4 students at

SDN 06 Tapa, Bone Bolango Regency. In the initial stage, researchers collected student learning outcomes before and after using the Jarimatika method. After the data is processed, the average student learning outcomes are obtained before using the Jarimatika method (71.94) and after using the Jarimatika method. (82.71).

From this percentage, it can be seen that learning outcomes after using the Jarimatika method are higher than student learning outcomes before using the Jarimatika method, meaning that the use of the Jarimatika method can affect student learning outcomes. Jarimatika (short for finger and arithmetic) is a method of counting using fingers. a simple and fun way to teach children basic arithmetic using the fingers (Sunhaji 2012:38). According to Wulandari (2005:17) Jarimatika is a way of counting times-for-plus-subtract operations using the fingers. This method has the advantage that it provides a visualization of the counting process, makes children happy when used, does not burden the child's brain memory and the tool is free to always carry and cannot be confiscated during exams. This method is very easy for students to accept. Learning it is also very fun. While the Jarimatika method has ten advantages according to Fajar (2012:45), namely:

1). Simple, without using 34 kinds of formulas.

2). Smart, optimizes children's right and left brain functions.

3). Standard, finger counting method that is easy to understand universally.

4). Safe, a method of calculating that is safe and does not violate the rules during the exam.

5). Real, the real process of calculating and obtaining results directly.

6). Quick, quick counting techniques and tricks

7). Practical, a practical counting method that can be used anytime and anywhere.

8). Effective, effective communication media between teachers and children.

9). Fun, a fun learning method while playing for children.

10). Award, get an award.28

CONCLUSION

Based on the research results obtained, it can be concluded that there is an effect of using the Jarimatika method on learning outcomes of multiplication of natural numbers in grade 4 students at SDN 06 Tapa, Bone Bolango Regency, which can affect student learning outcomes. This can be seen from the difference in learning outcomes before using the Jarimatika method to get an average the average student learning outcomes (71.94) and after using the Jarimatika method to get the average student learning outcomes (82.71). In this case, the average student learning outcomes using the Jarimatika method are higher than the average student learning outcomes before using the Jarimatika method, meaning that the effect of using the Jarimatika method on the learning outcomes of multiplication of natural numbers in grade 4 students at SDN 06 Tapa, Bone Bolango Regency can affect student learning outcomes.

Suggestion

Based on the conclusions above, various suggestions that can be submitted to the relevant parties as education providers can be made, as follows:

a. For teachers, it is hoped that they can use the Jaritmatika method as a reference to improve student learning outcomes.

b. For students, it is hoped that with this research, students will get better educational services.

c. For schools, especially for school principals, this research can be used as a benchmark for choosing learning methods that can improve student learning outcomes.

d. For researchers, this research can provide broader knowledge and increase motivation when teaching later.

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