

Basic Multiplication Knowledge Acquiring Based on Mathematical of Fingering System

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Abstract

Acquiring Basic Knowledge Multiplication is one stage of skill trainings. The activities associated with skill development are designed to acclimate students to thinking quickly and precisely about facts, concepts, formulas, and problem-solving techniques. One technique for skill coaching is to employ the Mathematical of Fingering System. These writings are a type of library research in which the author discusses the importance of basic multiplication in the education of Islamic elementary school teachers. Correspondingly, the researchers examine how the concept of the basic multiplication knowledge acquiring based on mathematical of fingering system, and the application of the education of Islamic elementary school teachers are incorporated into the basic multiplication knowledge acquiring based on mathematical of fingering system.

Keywords

learning; basic multiplication knowledge; mathematical of fingering system



I. Introduction

At this time, technology and knowledge are advancing at a rapid rate. Human beings, with all their priorities and problems, are dynamically required to adapt and solve all challenges encountered. Naturally, fixing any difficulties demands knowledge, ingenuity, and wisdom in order to avoid creating tougher problems in the process. To develop a quality human being is inextricably linked to the world of education (Aqib et al., 2008), as education is one of the vehicles for the birth of a quality and self-sufficient generation. As a result, education must also be of high quality.

Education is considered to have a very important role in promoting the civilization of a nation. Good quality education can encourage the creation of a quality society, creative and productive until finally able to achieve welfare. Through this national education system, the government should be able to ensure equal distribution of educational opportunities, as well as the relevance and efficiency of education management to face challenges in line with the changing demands of local, national and global life. (Saputra, A. 2018)

The education of character values should be carried out in the family environment, but due to various preoccupations and parents' negligence, the school must be empowered to be able to provide the best students character educations. Why does it have to be at school? Because schools are the ones who have quality human resources, namely is teachers as the fasillitator. Supported by a variety of law enforcement, various school programs and a

conducive school environment, the education of optimistic character values will be more successful. (Sikumbang, A. et al. 2020)

One way to increase human quality is through education, particularly through mathematics, as mathematics is required in many aspects of daily life, such as purchasing and selling, loan receivables, and product manufacturing. Mathematics' conclusion is crucial because humans are inextricably linked to problems that must be solved. Critical thinking is required to tackle these challenges. This means that when revealing difficulties, planting solutions, researching solution stages, suspecting due to insufficient knowledge, and proving the theorem, the ability to know and feel will be there (Hudojo, 1997).

According to Kline (in Simanjuntak, 1994), a country's awakening is contingent upon growth in the field of mathematics. In conclusion, a nation or country will continue to exist if its human resources are capable of correctly mastering mathematics. Given the importance of mathematics in the realm of life outlined above, mathematics education must employ the appropriate strategy to ensure that the concepts ingrained in students' minds are not readily forgotten or even survive for life. According to Zulkardi (2003), the low achievement and unfavorable student attitude toward mathematics are caused by less effective media, implying that teachers continue to utilize outdated approaches. Because low mathematics learning results can be attributed to a variety of factors, including students, communities, parents, and instructors, initiatives to boost mathematical achievement must take these aspects into account (Hudojo, 1988).

According to researchers' experience teaching mathematics, the majority of students are unable to perform multiplication operations. The multiplication of the average value over the last three years in the basic fact material reaches only 46, whereas the minimal completeness standard (KKM) or completeness limit is 65. Class completion occurs when 41% of students have mastered the provided minimum completeness requirements, whereas class completion occurs when 70% of students have mastered the minimal completeness standard (KKM). With the above-mentioned reality in mind, the researchers feel compelled to replace a system that has been less effective at boosting students' learning outcomes in multiplication material, particularly mastery of the idea of basic multiplication.

From the basic competency "do the multiplication of numbers which the results are two numbers" in class II, the instructor frequently struggles to infuse the concept of multiplication, particularly the basic facts of multiplication, namely the multiplication of two numbers. In this context, the teacher explains that multiplication is simply repeated addition, which is accurate. However, in actuality, if the number can still be computed with the finger, the second grade pupil may still understand the concept, for example, counting 3×5 read three times, which is $5 + 5 + 5$. (Mulyadi, et al, 1994). However, if the number begins with 9×8 , students get disinclined to think because the number series is so long.

From the problem the author strives to overcome it, namely by applying an easy, fast, precise and fun learning strategy, namely going through the Mathematical of Fingering System.

II. Research Methods

The method used in this research is the library research which describes the acquiring of the basic knowledge based on the Mathematical of Fingering System in Islamic elementary school teacher education.

III. Results and Discussion

The basic knowledge of Mathematical of Fingering System-based multiplication will be discussed in this component, beginning with the concept of multiplication, the technique of the Mathematical of Fingering System, and the application of the Islamic elementary school teacher education.

3.1. Concept of Multiplication Operations

Fundamental multiplication is one of the requirements for elementary school students, particularly in the Islamic elementary school. Mastery of the basic knowledge of multiplication is critical in order to prepare students to learn additional materials that acquire mastery of the basic knowl. Multiplication of two or more numbers using long or short constituent methods requires students to acquire basic multiplication knowledge. Multiplication is defined as the product of two numbers from the set of 1,2,3,..... The maximum number of results is 81. The basic knowledge of multiplication is that the product of two numbers is one point with the greatest result being 81. Entering the basic knowledge of multiplication, such as 5×5 , 6×7 , or 9×9 , is not a basic knowledge in the case of 5×12 , 10×6 , and others. Acquiring Basic Knowledge Multiplication is a step of skill coaching, skill development exercises aimed at students who are accustomed to receiving facts, concepts, formulas, or problem solving procedures quickly and precisely. One way for skill coaching is to employ the Mathematical of Fingering System. It is believed that by selecting this strategy, students will be able to recall basic multiplication facts more easily and so solve mathematical problems involving basic multiplication facts more quickly.

The basic knowledge of multiplication are the addition and subtraction of two numbers in the range 1,2,3,4,5,6,7,8,9,0. Numbers are abstract concepts. Numbers indicate the number of elements in a set. The number symbol is a representation of numbers in the form of a symbol, graphic, or graph (Negoro, 1987). There are 4 basic calculation operations, namely sum, reduction, division and multiplication. The reverse reduction in addition. Multiplication is the opposite of the distribution.

Multiplication is a repeat addition. 3×5 can be read three times five or five times three, then 3×5 means $5 + 5 + 5$ or 5×3 means $3 + 3 + 3 + 3 + 3$. Value of $3 \times 5 = 15$, also $5 \times 3 = 15$. So the value of $3 \times 5 = 5 \times 3$, but the meaning of 3×5 is different from 5×3 . Why is 3×5 with 5×3 in question? As a picture when we buy drugs in pharmacies, written rules for drinking 3×1 capsule, it means morning 1, noon 1, and 1 night, math sentence $3 \times 1 = 1 + 1 + 1$. While 1×3 means every 3 capsules, Mathematical sentence $1 \times 3 = 3$.

3.2. Mathematical of Fingering System

Mathematical of Fingering System is a technique to facilitate submission of multiplication material. Systems or learning techniques are often intercourse with learning methods. According to Gerlach and Ely, 1980 (in UNO, 2008) techniques or systems are roads, tools, or media used by teachers to direct students' activities towards the goals to be achieved. While the method is the way the teacher used in carrying out its function is a tool to achieve learning goals. According to studies, both systems and approaches are utilized to present material in such a way that it is easily accepted by students. The distinction is made when the system is a noun and the technique is a verb.

Mathematical of Fingering System is a way to count (operating times-added-added) by using fingers for children aged 4-12 years (Wulandari, 2000). So the Mathematical of Fingering System is a tool or media in the form of a finger used by the teacher to direct students to achieve success in learning mathematics.

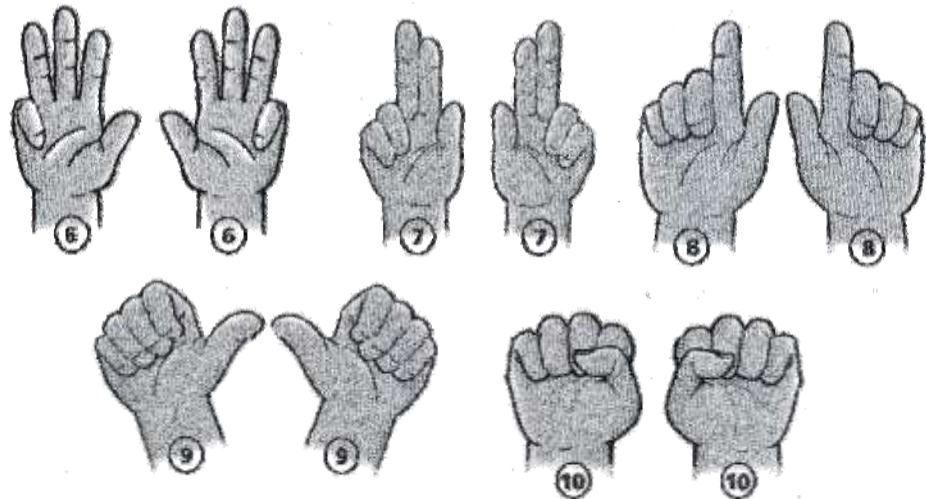


Figure 1. Multiplication calculation formation utilizing fingers in the basic group numbers 6-10

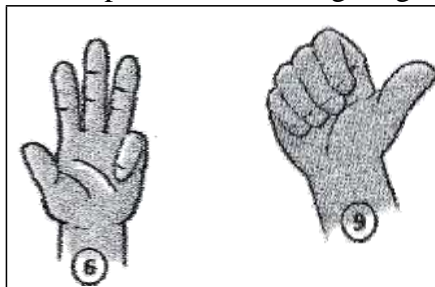
This technique is highly enjoyable to teach since it follows the rules for teaching counting, which include the following:

- a. Starting by understanding the number concept, the number symbol and basic count operation.
- b. Teaching how to count with the fingers
- c. The process is started, done and ended happily.

The sample questions and solutions are as follows:

Example 1.

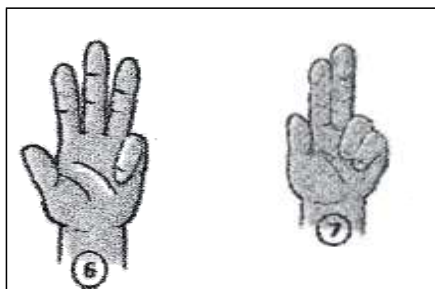
The example of multiplication with Fingering System: 6 x 9



Closed fingers are tens, the open finger is the unit multiplied. So $6 \times 9 = (10 + 40) + (4 \times 1)$
 $= 50 + 4$
 $= 54$

Example 2.

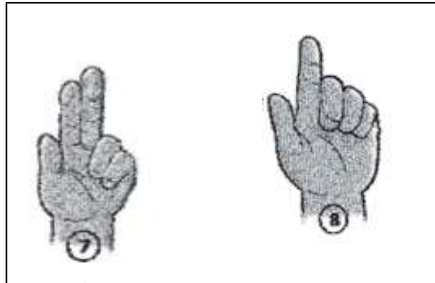
The example of multiplication with Fingering System: 6 x 7



Closed fingers are tens, the open finger is the unit multiplied. So $6 \times 7 = (10 + 20) + (4 \times 3)$
 $= 30 + 12$
 $= 42$

Example 3.

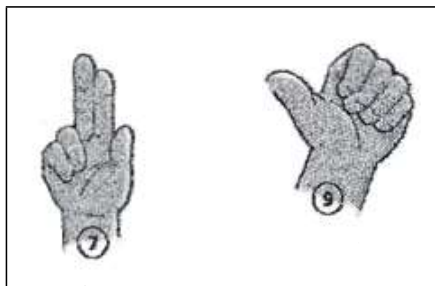
The example of multiplication with Fingering System: 7×8



Closed fingers are tens, the open finger is the unit multiplied. So $7 \times 8 = (20 + 30) + (3 \times 2)$
 $= 50 + 6$
 $= 56$

Example 4.

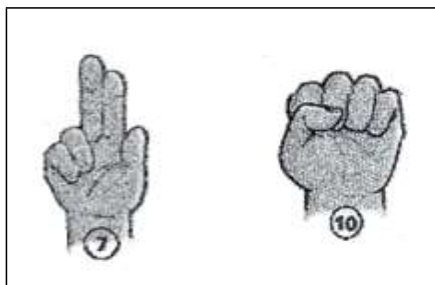
The example of multiplication with Fingering System: 7×9



Closed fingers are tens, the open finger is the unit multiplied. So $7 \times 9 = (20 + 40) + (3 \times 1)$
 $= 60 + 3$
 $= 63$

Example 5.

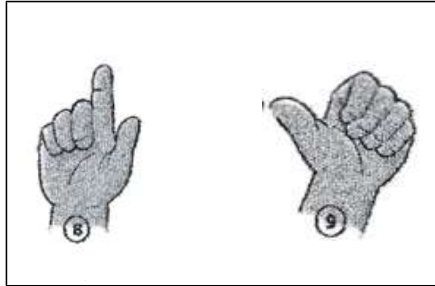
The example of multiplication with Fingering System: 7×10



Closed fingers are worth tens, the open finger is worth the unit multiplied. So $7 \times 10 = (20 + 50) + (3 \times 0)$
 $= 70 + 0$
 $= 70$

Example 6.

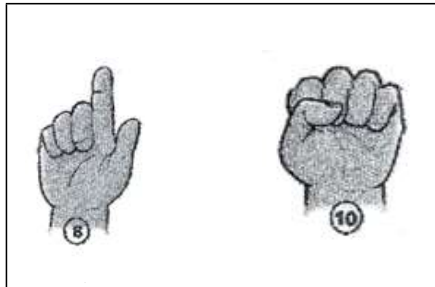
The example of multiplication with Fingering System: 8×9



Closed fingers are tens, the open finger is the unit multiplied. So $8 \times 9 = (30 + 40) + (2 \times 1)$
 $= 70 + 2$
 $= 72$

Example 7.

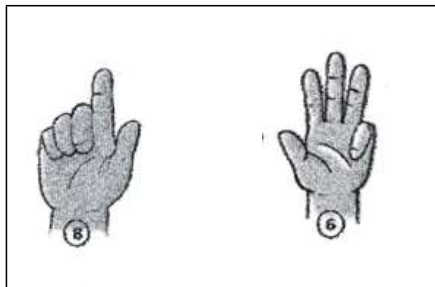
The example of multiplication with Fingering System: 8×10



Closed fingers are tens, the open finger is the unit multiplied. So $8 \times 10 = (30 + 50) + (2 \times 0)$
 $= 80 + 0$
 $= 80$

Example 8.

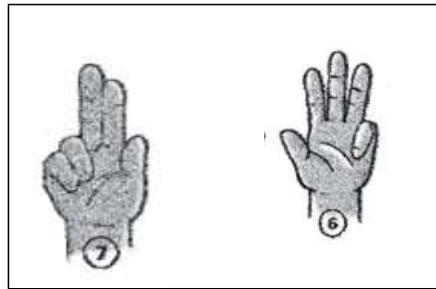
The example of multiplication with Fingering System: 8×6



Closed fingers are tens, the open finger is the unit multiplied. So $8 \times 6 = (30 + 10) + (2 \times 4)$
 $= 40 + 8$
 $= 48$

Example 9.

The example of multiplication with Fingering System: 7×6

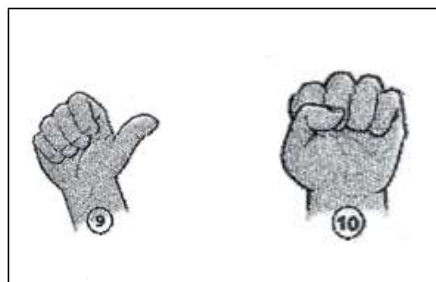


Closed fingers are worth tens, the open finger is worth the unit multiplied. So $7 \times 6 = (20 + 10) + (3 \times 4)$

$$\begin{aligned} &= 30 + 12 \\ &= 42 \end{aligned}$$

Example 10.

The example of multiplication with Fingering System: 9×10



Closed fingers are worth tens, the open finger is worth the unit multiplied. So $9 \times 10 = (40 + 50) + (1 \times 0)$

$$\begin{aligned} &= 90 + 0 \\ &= 90 \end{aligned}$$

The numbers more than the Mathematical of Fingering System has the following advantages: (1) the tools are readily available and do not require purchase; (2) The tool will never be left behind or confiscated during the exam; and (3) The tools do not burden the brain memory. The above system was created by a housewife named Septi Peni Wulandari from Depok, West Java, the principle he used was his book Hendra BC with the title Kuncung dan Bawuk Pintar Berhitung (1960). He was confused by the system his children had received so far, which he believed was heavy on the brain. The research demonstrates that the finger may be used to count mathematics up to four digits / thousands. This technique began to take shape in 2000, and each stage of his discovery was taught to his kid, as well as nearby children.

It is obvious from the readers and pupils who have benefited immensely from this technique, as seen by the path of the Jarimatika name mushrooming. Until 2007, the concept of branch calculation with one's fingers reached a maximum of 56 branches. Septi got the Danamon Award in 2006 for his efforts empowering the community and as a social innovator at the University of Indonesia's Faculty of Post-Bachelor. In 2007, he was recognized by the Minister of Youth and Sports as a creative young man. Furthermore, the Indonesian Record Museum lists this course as having the most participants in terms of learning (5,026 mothers and children). The researchers are motivated to build this system in students as a result of the facts presented above.

IV. Conclusion

The notion of multiplication operations is defined in this text as the multiplication of two numbers, which are 1,2,3,4,5,6,7,8,9,0. Numbers are abstract concepts. Numbers indicate the number of elements in a set. The number symbol is a representation of numbers in the form of a symbol, graphic, or graph. While the Mathematical Fingering System is a tool or medium in the shape of a finger that the instructor uses to guide pupils toward success in mathematics learning.

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