

The Enhancement of The Ability to Calculating Multiplication in Elementary Schools Using Congklak Media to Catch Up Post Covid-19

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ABSTRACT

This study aims to improve the arithmetic ability of third grade elementary school in Mathematics, especially multiplication counting operations 1-10 of up to 100 using congklak media. This research was conducted using classroom action research through 2 cycles. The results of this study proved that congklak media can improve student learning outcomes. This can be proven in cycle 1 there is 8 students complete multiplication 1-10 in the story questions and stacked multiplication, and there is 10 students not completed, with classical completeness obtained by class III students in the cycle I this amounted to 44,45%. In this 2nd cycle, there is 16 students complete multiplication 1-10 in the story questions and stacked multiplication, and there is 2 students not completed, with classical completeness obtained by class III students in the cycle I this amounted to 88,89%. So that student learning outcomes from cycle I and cycle II have increased with completed students 70% with a excellent category. With the results obtained from this study, expected use of congklak media can be applied and increased in schools to make it easier for students to understand and perform multiplication counting operations using concrete and fun objects.

Keywords: Online Learning; Counting Operations; Congklak Games.

1. INTRODUCTION

The emergence of the Coronavirus Diseases virus or can be referred as Covid-19 in the middle of 2019, had a big impact on the world including Indonesia. There have been many changes that have occurred due to the emergence of the co-19 pandemic, one of which is in the education field. The high death and transmission rate caused by Covid-19 has forced the government to take firm steps to stop the spread. In response to this, the Minister of Education issued circular letter No. IV of 2020 concerning the implementation of learning activities carried out remotely using the online method.

Online learning is a teaching and learning activity that is carried out online using learning applications and social networks (R Gilang K, 2020, p. 17). Learning media is used by educators as a tool to convey material to students to make it clearer and to increase student learning motivation (SailySelly et al., 2022). Online learning is a learning system that is carried out by educators and students without face-to-face meetings. By using a platform that can assist the teaching and learning process even though the distance gets in the way (Handarini&Wulandari, 2020). So it can be concluded that online learning is a teaching and learning activity carried out through social media networks that can be done anytime and anywhere.

Based on the results of interviews that were conducted by the researcher with the teacher of grade 2 at UPT SDN 45 Gresik, when online learning was taking place, grade III students were lagging behind in performing multiplication arithmetic operations 1-10 with a product of up to

100, which should be in class III students will be introduced to multiplication 1-10. 10 with the product up to 1000. Arithmetic operations are the main capital in learning mathematics. Students are required to master arithmetic operations to be able to solve math problems both at school and in their daily basis. The arithmetic operation itself is divided into 4, such as addition, subtraction, multiplication and division (Karim, 1996, pp. 99–102).

In order to catch up, learning media is needed to make it easier for students to solve the problems given. The learning media are humans, materials, or events that make students acquire knowledge, skills, or attitudes according to Gerlach & Ely in (Arsyad, 2017, p. 3). The learning media will carry forward teaching and learning process and be able to make it easier for students to understand the content or material conveyed by the teacher. In addition, using learning media will greatly assist students in increasing student motivation and understanding the learning through interesting media so that it is easier to understand.

So that the researchers used congklak media as a way to increase the ability to count multiplication for grade 3 students. Congklak or dakon is known as one of the traditional games in Indonesia. The author uses congklak media as a counting tool so that students can get to know more about culture in Indonesia. Indonesian culture is a cultural heritage that is the spearhead of the birth of national culture (Umam et al., 2019). By introducing Indonesian culture through traditional games into one of the compulsory subjects, students can preserve the traditional congklak game so that it will not be forgotten. Besides that, by using congklak media, students can improve their multiplication calculation skills through real and fun activities.

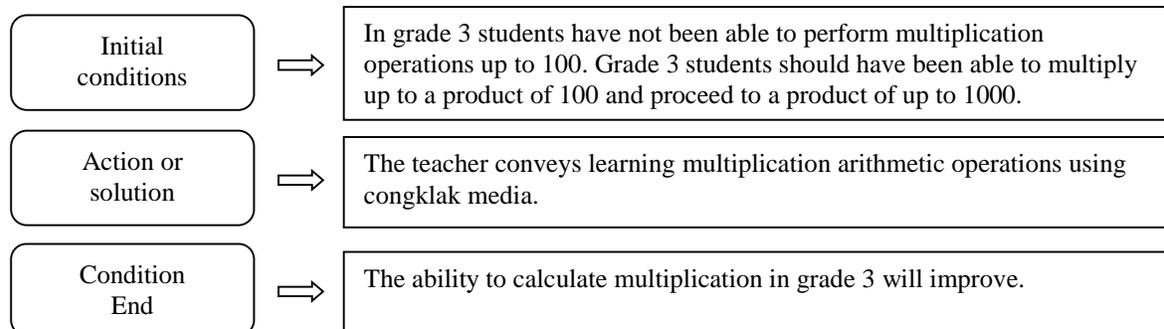
Pictures 1 Congklak



Description :

- 1 : Lubung Rumah
- 2 : Lumbung/Lubung Induk
- 3 : Buah Congklak

The framework of thinking in this study can be described as follows:



2. METHOD

This study uses Classroom Action Research using 2 cycles. The subjects of this study were all class III students of UPT SDN 45 Gresik for the academic year 2022/2023 with a total of 18 students consisting of 6 female students and 12 male students. The procedure for this research activity refers to the Classroom Action Research model developed by Kemmis and Mc Taggart

in 1988, using four action research components starting from the planning, implementation, observation, and reflection stages (Arikunto, 2015, p. 42). Data analysis in this study was obtained from the results of tests conducted at the end of each cycle to determine changes in student learning outcomes. The data that has been collected will be analyzed, with the aim of achieving completeness of student learning outcomes. The analysis includes individual completeness analysis with the formula:

$$P = \frac{f}{N} \times 100\%.$$

Description :

P : Individual completeness percentage

F : Amount of indicator achievements

N : Amount of total indikator

Classical completeness analysis with the formula :

$$PKK = \frac{\text{Students with } \geq 75 \text{ scores}}{\text{Total subjects}} \times 100\%. \text{ Sugiono on (Maisarah, 2020, p. 78).}$$

Learning is categorized as successful if there are 70% of students who complete the learning activities with a minimum score of 75 (KKM). with Good criteria.

3. RESULT

This research was conducted in June-August 2022. In this study the researcher acted as a teacher accompanied by a grade 2 teacher for the 2021-2022 academic year, namely Mrs. Ruhi Dian Rahmita S.pd. This research activity was carried out by adjusting the learning schedule at UPT SDN 45 Gresik. This research was conducted for 2 cycles with 1 meeting in each cycle. And before the cycle I activities began, the researcher conducted interviews with the class teacher, then the researcher took the initial data to determine the students' abilities before the action was held.

Interview activities

This interview activity was conducted before carrying out the action and preparation of the research. This interview activity was conducted by researchers with class 2 teachers at UPT SDN 45 Gresik for the 2021-2022 academic year. In this interview activity the researcher wanted to find information related to learning mathematics in grade 2 before the pandemic, during the pandemic and after the pandemic. The results of this interview activity are as follows:

1. Daring learning activities use whatsapp group media and zoom
2. Teachers experience difficulties in measuring students' abilities directly
3. Learning only goes in one direction, the interaction between the teacher and students is also very little
4. During the learning process, almost all material is provided through social media, both on YouTube and in the WhatsApp group. So that the online learning process cannot be fully documented.
5. Differences in student learning outcomes when online are better when compared to after online
6. Students are still not able to do multiplication counting operations up to 100 correctly.

Initial data collection

From the results of the interviews that have been conducted, the researcher collects initial data to find out the extent to which the students' abilities are before the action is taken. In the first cycle, students were given 10 description questions with a maximum score of 10 for each question. The question indicators are:

1. Shows mathematical sentences related to mathematics.
2. Solve the multiplication of two numbers involving whole numbers with a product of up to 100 in everyday life.
3. Solve multiplication with the result of whole numbers up to 100 in everyday life.

Students' arithmetic abilities before the action

Students	Skor	Description
ARR	35	TT
ASK	50	TT
JRS	35	TT
KHM	40	TT
MXVR	30	TT
MN	0	TT
MBM	60	TT
MAR	50	TT
MBM	15	TT
MIS	55	TT
MMB	20	TT
MRF	0	TT
MSQ	25	TT
NEFA	85	T
QSS	10	TT
SB	80	T
WPA	10	TT
ZalU	85	T
Amount	685	
Average	38,05	

The students are categorized as complete (T) if students are able to fulfill the indicators given with a score of ≥ 75 . The students are categorized as incomplete (TT) if students are unable to fulfill the question indicators with a score of < 75 .

After getting the individual completeness results the researcher also calculates the classical completeness obtained by the students with the formula:

$$PKK = \frac{\text{Students with } \geq 75 \text{ scores}}{\text{Total subjects}} \times 100\%$$

$$PKK = \frac{3}{18} \times 100\% = 16,67\%$$

Learning is categorized as successful if there are 70% of students who complete the learning activities with a minimum score of 75 (KKM).

Cycle I

After getting initial data from student learning outcomes, the researcher decided to use congklak media as an effort to catch up on calculating multiplication. In the first cycle, students were given 10 description questions with a maximum score of 10 for each question. The question indicators are:

1. Shows mathematical sentences related to mathematics.
2. Solve the multiplication of two numbers involving whole numbers with a product of up to 100 in everyday life.
3. Solve multiplication with the result of whole numbers up to 100 in everyday life.

Students' arithmetic abilities cycle I

Students	Skor	Description
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ARR	65	TT
ASK	80	T
JRS	60	TT
KHM	80	T
MXVR	70	TT
MN	50	TT
MBM	80	T
MAR	70	TT
MBM	60	TT
MIS	75	T
MMB	70	TT
MRF	65	TT
MSQ	60	TT
NEFA	90	T
QSS	75	T
SB	100	T
WPA	50	TT
ZaU	90	T
Amount	1290	
Average	71,76	

The students are categorized as complete (T) if students are able to fulfill the indicators given with a score of ≥ 75 . The students are categorized as incomplete (TT) if students are unable to fulfill the question indicators with a score of < 75 .

After getting the individual results, the researcher calculates the classical completeness obtained by the students with the formula:

$$PKK = \frac{\text{Students with } \geq 75 \text{ scores}}{\text{Total subjects}} \times 100\%.$$

$$PKK = \frac{8}{18} \times 100\% = 44,45\%.$$

Learning is categorized as successful if there are 70% of students who complete the learning activities with a minimum score of 75 (KKM). So that it can be seen from the results obtained by students during the first cycle test students still have not fulfilled the learning completeness with less predicate. So the researchers continued the research in cycle II.

Cycle II

Cycle II was carried out with the aim of correcting errors and re-explaining the material given to students to achieve the predetermined mastery. After discussing with class teachers and lecturers, in cycle II several improvements were made in making questions to facilitate student understanding by providing dots to find out how to answer the questions given, equating perceptions of how to answer questions and reminding again how to do multiplication in layers.

Students' arithmetic abilities cycle II

Students	Skor	Description
ARR	95	T
ASK	100	T
JRS	80	T
KHM	100	T
MXVR	80	T

MN	80	T
MBM	90	T
MAR	100	T
MBM	80	T
MIS	90	T
MMB	90	T
MRF	70	TT
MSQ	80	T
NEFA	100	T
QSS	100	T
SB	100	T
WPA	50	TT
ZaU	90	T
Amount	1575	
Average	87,5	

In the second cycle, students were given 10 description questions with a maximum score of 10 for each question. The question indicators are:

1. Shows mathematical sentences related to mathematics.
2. Solve the multiplication of two numbers involving whole numbers with a product of up to 100 in everyday life.
3. Solve multiplication with the result of whole numbers up to 100 in everyday life.

The students are categorized as complete (T) if students are able to fulfill the indicators given with a score of ≥ 75 . The students are categorized as incomplete (TT) if students are unable to fulfill the question indicators with a score of < 75 .

After getting the individual results, the researcher calculates the classical completeness obtained by the students with the formula:

$$PKK = \frac{\text{Students with } \geq 75 \text{ scores}}{\text{Total subjects}} \times 100\%.$$

$$PKK = \frac{16}{18} \times 100\% = 88,89\%.$$

So it can be concluded that by using congklak media students can do multiplication arithmetic operations 1-10 up to 100 in the form of story questions or in the form of multiplication in layers with a significant increase in students' arithmetic abilities.

4. DISCUSSION

Grade 3 students should know and be able to solve multiplication problems 1-10 with multiplication results up to 100 smoothly because they have been previously taught in grade 2 according to KD 3.4 and KD 4.4 class 2 semester 1 about :

KD 3.4 Explain multiplication and division that involve whole numbers with products up to 100 in everyday life and link multiplication and division.

KD 4.4 Solve multiplication and division problems involving whole numbers with products up to 100 in everyday life and link multiplication and division.

So that in grade 3 students should be able to perform multiplication arithmetic operations 1 – 10 smoothly and be able to multiply up to 1000. As stated in KD 3.1 and KD 4.1 which reads :

KD 3.1 Explain the properties of arithmetic operations on whole numbers.

KD 4.1 Solve problems that involve using the properties of arithmetic operations on whole

numbers.

With the learning objectives students are able to correctly determine the product of two whole numbers with a result of up to 1,000.

From the results obtained by students before the action there were only 3 students who completed and 15 students were declared incomplete in solving the questions given. So that students still do not fulfill learning completeness with less predicate. This is influenced by several factors including:

1. There are some students who still do not understand how to perform multiplication arithmetic operations;
2. Students are still not able to perform multiplication arithmetic operations 1-10;
3. Students who are only able to perform dozens of arithmetic operations;
4. students have not been able to change word problems into mathematical sentences;
5. students still don't know how to solve stacked multiplication.

After carrying out the initial data collection activities through initial data collection, the researcher took further action to be able to improve the student's ability by conducting learning using congklak media.

This cycle I activity is guided by the lesson plan which consists of opening, core and closing activities that have been prepared by the teacher beforehand. In the core material of using congklak media, the teacher begins by introducing students to the shape of congklak and its parts. Then the teacher gives an example of simple multiplication using congklak.

For example, the teacher gives a 3 x 4 problem. Then, the teacher explains how to complete the multiplication by using the congklak media, where every 3 congklak pieces will be inserted into the 4 holes of the lumbung congklak. The students and teachers count the total number of biji congklak.



After counting, the number of biji congklak is 12. So it is written mathematically $3 \times 4 = 12$.

This method can also be applied to stacked multiplication. For example, the teacher gives a 17×3 question.

- a.
$$\begin{array}{r} 17 \\ \times 3 \\ \hline \end{array}$$
 First step, the students directed to write the correct arrangement for calculating stacked multiplication by arranging tens on the tens row and units on the unit row. So it can be written down

- b.
$$\begin{array}{r} 17 \\ \times 3 \\ \hline 21 \\ 51 \\ \hline \end{array}$$
 Next, the teacher directs how to multiply stacked multiplication by doing unit multiplication, namely multiplying 7 and 3. Using congklak media, 7 congklak seeds can be put into 3 congklak house holes. So that the result is 21. The unit of 21 (1) will be written straight on the placement of the unit value. While the tens of 21 (2) will be stored beside the calculation

- c. The third step, multiplying the unit value below with the tens value above, namely 3×1 . Using the congklak media, the teacher inserts 3 congklak pieces into 1 congklak house hole. So that the results is 3.

17

- d. $\begin{array}{r} 17 \\ \times 3 \\ \hline 51 \end{array}$ In this last step, the product that was carried out in step 3 will be added to the number of tens that was previously stored. So that $3 + 2 = 5$. Then the results will be written straight on the tens value placement. So it can be concluded that the product of $17 \times 3 = 51$.

This cycle I activity there is 8 students were declared to have completed multiplication 1-10 in the form of word problems and multiplication in layers and 10 students were declared incomplete. This result occurs because:

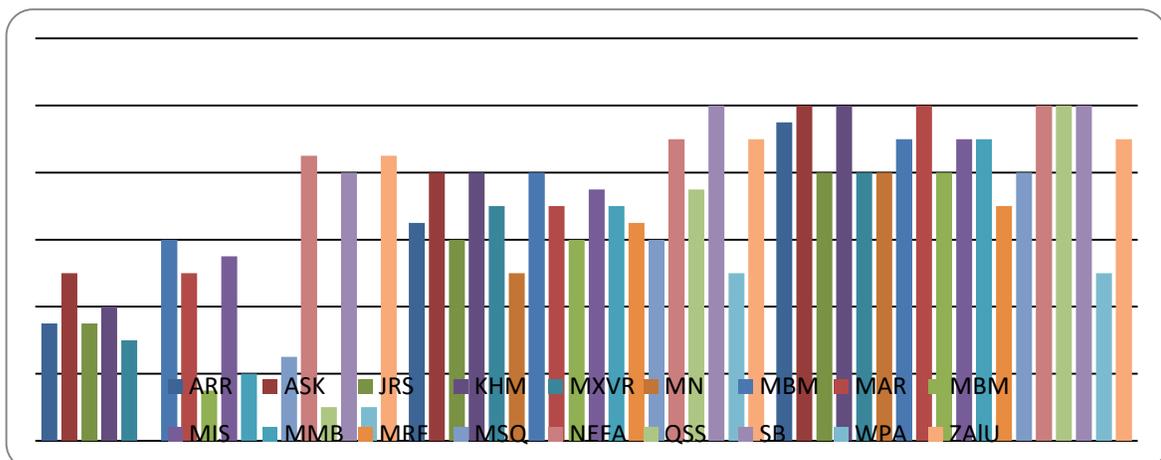
1. Students still have difficulty in spreading congklak seeds
2. Students still have difficulty counting to tens;
3. Students still have difficulty understanding story problems;
4. Students still have difficulty understanding the location of tens and units in multiplication with layers.

In the first cycle, the students' success in completing multiplication arithmetic operations was still lacking, so the researcher carried out the second cycle at the next meeting. In cycle II, the researcher made improvements to the questions and also explained the material presented earlier more easily so that students could absorb it. and after some repairs there were 16 students who were declared to have completed multiplication 1-10 in the form of story questions and multiplication in layers and 2 students were declared incomplete. This result occurs because:

1. In learning activities, students can know concretely the learning that has been done so far. Students can prove that the multiplication results that have been done so far can be seen in real terms. In learning by using congklak it makes students more active and enthusiastic in learning multiplication of mathematics.
2. Students are able to understand the instructions given in changing word problems into mathematical number notation very well.
3. Students already know the location of tens and units, and have understood how to perform stacked multiplication arithmetic operations.

So that it can be seen from the results obtained by students when the cycle II test was declared successful in the excellent category.

Chart 1 Increase student learning



5. CONCLUSION

Conclusion

Based on the research results regarding increasing the ability to count multiplication post-covid 19 using congklak media in class III students at UPT SDN 45 Gresik, in general students can improve their ability to count increments. It's proven that in each learning activity there is an increase in learning outcomes during cycle I and cycle II, the increase in students' arithmetical abilities increased by 44.45%.

So from the research that has been done it can be concluded that congklak media can improve the calculation skills of grade 3 students. By using congklak media students can solve multiplication questions 1-10 up to 100 with word problems and multilevel multiplication. And if done in the long term, students can memorize multiplication 1-10 well and be able to count 1-100.

Suggestion

Based on the research results, researcher can provide some suggestions for readers including :

1. For students: for students who have difficulty doing multiplication calculations, you can use congklak media as a practice media counting until fluent;
2. For teachers: teachers can introduce students how to calculate multiplication 1-10 using real media such as congklak, because congklak media is very easy to find at affordable prices. And it has been proven that after using congklak media students can perform multiplication operations 1-10 up to 100 more fluent than before.
3. For schools: to support the development of student abilities, schools need to facilitate the learning process properly, so that the learning process can maximally. Such as providing congklak media so that students can focus more on arithmetic exercises.
4. For the science of mathematics: the use of congklak media as an effort to speed up the lag of students' counting on multiplication arithmetic operation material needs to be increased. It has been proven that congklak media can make it easier for students to understand how to do multiplication with concrete media, complete multiplication in layers, and understand story problems in mathematical notation. This can be proven by the increased student learning outcomes in each cycle.

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