

# IMPROVING THE ABILITY TO UNDERSTAND THE CONCEPT OF MULTIPLICATION THROUGH *THE RME* APPROACH WITH THE HELP OF THE CONGKLAK GAME FOR CLASS III ELEMENTARY SCHOOL

Miftakhatul Ummayyah<sup>1</sup>, Nevananda Arica Lungdiansari<sup>2</sup>, Friska Dyah Ayuk Pratiwi<sup>3</sup>,  
Diana Ermawati<sup>4</sup>

<sup>1,2,3,4</sup> Primary School Teacher Education, Muria Kudus University, Indonesia

## Article Information

### Article History:

Accepted: 11-07-2023

Revised: 11-08-2024

Published: 30-09-2024

### Key words:

Ability to calculate multiplication,  
Realistic Mathematic Education (RME),  
congklak game

## ABSTRACT

This research was carried out because it saw a lack of optimal understanding of the concept of multiplication calculations. Objective from study This namely knowing how to increase the ability to understand the concept of calculating multiplication using (*Realistic Mathematic Education*) RME through the innovation of the congklak game in mathematics learning. To obtain the results of this research, the research method used was Classroom Action Research (PTK). The subjects of this research were 23 grade III students at SD 2 Klaling for the 2022/2023 academic year, consisting of 7 male students and 16 female students. The data sources for this research are students and teachers. Data collection techniques include interviews, observation, tests and documentation. Data analysis techniques are quantitative and qualitative. This research was carried out through two cycles that include four stages: planning, implementation, observation, and reflection. The research results showed that in cycle I the average score was 83.63 and 88.94 with a completion percentage of 84% and 94%, while in cycle II the average score was 95.78 with a completion percentage of 100%. In this way, it can be shown that the indicators of success have been achieved in accordance with what was expected, namely that at least 70% of students obtained a score  $\geq 70$ .

This is an open access article under the [CC BY-SA](#) license.



## Corresponding Author:

Diana Ermawati

Primary School Teacher Education, Faculty of Teacher Training and Education

Muria Kudus University, Indonesia.

Email: [diana.ermawati@umk.ac.id](mailto:diana.ermawati@umk.ac.id)

## 1. INTRODUCTION

Mathematics is the subject most avoided by students. Because they own presumption that mathematics That lesson Which difficult. For class on generally Already Lots use formula. However For Which class low Not yet too Lots use formula. Because Still learn operation count number. Operation count number That involve summation, subtraction, multiplication And distribution. This mathematics lesson does require a lot of understanding of concepts, skills counting as well as skills solution problem. I understand the concept through Mathematics lessons are wrong an ability to understand and explain situations in a class, which have general characteristics in mathematics (Rahayu et al., 2018) . Matter This The same based on study (Febriani et al., 2019) prove that ability student in communicate as well as explain use the language individually And can apply these concepts through a problem, then combine them between one concept with another concept. By p

That concept mastery is the outcome category students learn so they can define the lesson material using sentences Alone. Apart from that, mathematics learning should be more linked between draft mathematics with life child everyday (May et al., 2020) . According to (Khurriyati et al., 2022) opinion that when solve problem mathematical can give student with various innovation in activity Study teach as well as packaging interesting learning so they with easy understand material lessons given with a fun and involving atmosphere student in a way active (Bustami et al., 2018) , so they No I still think that mathematics is a subject incomprehensible, so from That, process teach him must hook in life (Ermawati & Zuliana, 2020) which states that " *The concept of understanding ability has a relationship with problem solving. Mathematical problem-solving ability is a very important ability in learning mathematics, because in its learning activities students learn about mathematical concepts while considering the development of students' ways of thinking* ". It can be explained that understanding the concept can be related to the ability to solve a problem. Students' thinking can be emphasized through learning mathematical concepts by linking them to solving mathematical problems in everyday life.

Based on earnings observations and interviews on Wednesday, March 15 2023 with the third grade teacher at SD 2 Klaling information was obtained that there were problems in mathematics subjects, because Mathematics subjects are considered difficult by students, because according to mathematics students the lessons are boring due to monotonous learning and students have difficulty memorizing multiplication. As a result, students also pay less attention during the learning process taking place. Part student absorbed play Alone . That matter Which cause many abilities students who lack understanding of multiplication calculation operations. This problem can be proven from the daily test scores of class III students who got a low score of 40 so they were incomplete. Sub-subjects considered difficult that is on material operation count multiplication. Multiplication is material base important Which must mastered by student. As has explained in research (Suprihatin & Padaela, 2019) that student experience not optimal in ability mathematical like process his learning only use method lecture and focus on the whiteboard explaining, then after explaining the material given practice questions. By p That student difficulty ~~was~~ solving the questions given . This can affect the value Study student . Therefore, it is done in various ways so can increase ability understanding draft draft multiplication through utilization media learning Which appropriate And effective.

With matter thus, Already Lots study Which prove that method Passive learning is very less effective for students. Effort to do activity One way to count for students is using the play while learning method namely using media games to make learning very fun for students. Fun learning this can help improve intelligence and sharpening ability student (Humairo & Amelia, 2021) . Playing also has benefits grow children better. For example, in cognitive and social development And physique on himself (Suminar, 2019).

The solution to the ideal of learning mathematics is through implementing the RME ( *Realistic Mathematics Education* ) approach through appropriate game media such as the congklak game which can make it easier for students to understand the concept of mathematical multiplication. Game cocky is a game traditional Which can used For 2 people play through congklak board And congklak seeds. By general material base cocky This made from wood And plastic. Whereas seed cocky Can use shell shell, gravel, marbles, sweet potato And other so on. Will but material base cocky This can innovated use cardboard or something else. And underneath there is a drawer which is useful for calculating amount seed cocky. So cocky This No must use material base on generally. We Can innovate in accordance with creativity or idea We Alone. There is a number of benefit game traditional cocky This ie 1) increase motivation and make students enthusiastic about learning, 2) results learn it become more increasing (Wahyuni, 2020) , 3) can practice thinking skills, numeracy skills, and can train children's honesty (Rohmatin, 2020) . This congklak learning media is a learning facility to improve student learning outcomes, in line with the opinion of Prianto & Putri (2017) in (Rahmawati & dkk, 2021) believes that: "complete learning facilities are able to help students in learning activities and the lack of learning facilities as well Lack of learning facilities can hinder learning activities. However besides That , For increase understanding draft multiplication Also must use model or approach learning Which appropriate, like model learning *Realistic Mathematics Education* (RME).

Approach learning Which used that is approach RME ( *Realistic Mathematics Education* ). The RME ( *Realistic Mathematics Education* ) approach is referring approach to view Freudenthal Actually mathematics need relate with facts , close to children's experiences as well in accordance like activity daily . According to (Ermawati & Riswari, 2020) that PMRI approach is a approach contextual mathematics for student . Problems in use in learning is originating problem from life daily student . However No close possibility problem the form a possible problems imagined by students , so problem the Can said as problem real . Freudenthal also believed that mathematics does not look like subject to be communicated directly, therefore it must be seen as an activity humans especially in the past (Flowers et al., 2016) .

Research conducted by (Indriani et al., 2022) . Study This aim see how much Far participant educate understand operation count multiplication with help RME method . This type of research uses quantitative

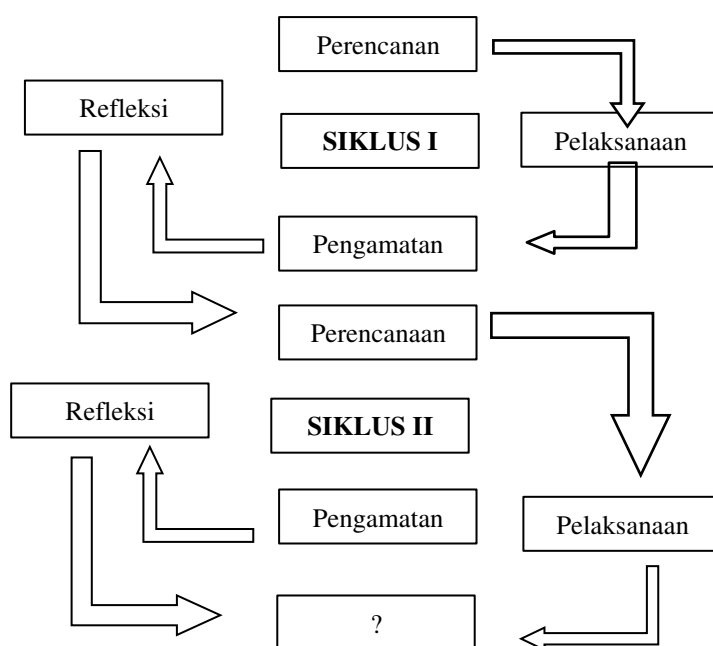
quasi-experimental methods. The results stated that the research students' understanding of multiplication increased, At understanding draft total repeated participant educate increase of 7.15% on the indicator . Characteristics multiplication found increase amounting to 17.86% on the indicator draft multiplication . Improvements were also found in abilities draft write mathematical models simple of 8.57% and for application draft multiplication to in question story increase by 25% on the indicator .

Research conducted by (Azzahroh et al., 2022) . Study aim For understand method CTL learning with count cocky influence interest as well as mark academic . Study This use type experiment through approach quantitative use CTL method ( Contextuak Teaching Learning) The results of the research stated application CTL learning method by counting congklak influence on interests and values academic participant educate . From the data shown If interest student before application method as much as 68% and after application method happen improvement by 79%. From using paried t-test get results 2-tailed sig analysis < 0.05 meaning application CTL method .

Based on background behind in on, For develop learning mathematics Which use media learning traditional cocky. Then The researcher plans to develop learning media with the title "Improving Ability to understand the concept of calculating multiplication through the assisted RME approach Game Congklak Student Class III elementary school.

**2. RESEARCH METHODS**

Method study This use type of Classroom Action Research (PTK). The Classroom Action Research (PTK) model in this research is the Kemmis-Mc Taggart model which is divided into 4 steps , namely the planning, implementation, observation and reflection stages (Maliasih et al., 2017) . Following model research cycle action class (PTK) :



**Figure 2 . Classroom Action Research (CAR) Cycle Chart using Kemmis & Mc Taggart**

Study this is the dependent variable namely increasing students' understanding of the concept of calculating multiplicationclass III elementary school 2 Klaling. And research this is the independent variable namely models learning RME (Realistic Mathematics Education) who helped game cocky.

This research was conducted at SD 2 Klaling. This research was carried out from March to March June 2023. The subjects of this research are all class III students for the 2022/2023 academic year totaling 23 students consisting of 16 students women and 7 students man . The data collection techniques used in this research are test and non-test. Test techniques used by researchers namely the evaluation instrument at the end of cycle I and cycle II. For non-test techniques, researchers used observation sheets , documentation and interviews . Analysis techniques The research data is in the form of qualitative and quantitative.

The stages carried out by the researcher were: 1) The researcher created a congklak media innovation after knowing the students' initial conditions regarding mastery of multiplication material, 2) The researcher began testing the congklak media innovation product by applying the RME (*Realistic Mathematics Education*) approach, 3) At this stage Finally, the researcher distributed the evaluation instruments at the end of cycle I and cycle II, to see until where is the ability to understand the concept of calculating multiplication in participants educate.

### 3. RESULTS AND DISCUSSION

In the initial conditions of mathematics learning, especially material on multiplication calculation operations, it is still done conventionally, namely: 1) the teacher explains the concept of multiplication calculations verbally, 2) the teacher when explaining the material only uses textbooks and worksheets, without using media to convey the concept. calculate multiplication, 3) there are obstacles in carrying out the process of learning multiplication material such as a lack of learning facilities in the classroom.

In this study, pre-cycle activities received the lowest score, namely 40, with the criteria of not having reached the KKM. This is because the learning is conventional, learning media Not yet used, students lack focus during activities learning, and students play alone with their friends.

In carrying out classroom actions there is a plan that includes 1) preliminary activities, 2) core activities then students are divided into several groups, 3) closing. From existing classroom action research carried out in elementary schools to obtain results including, cycle I learning on multiplication material through the RME approach. There are obstacles in carrying out learning, especially when explaining multiplication concept material without using learning media, lack of mastery of teaching materials, and the *cooperative learning model has not been used*. The highest score was 100 and the lowest score was 40, from the pre-cycle results, the average score was 83.68 with a percentage of 84%. Therefore, the value of the pre-cycle results is not as expected by the teacher. Based on the results of the first cycle evaluation, the highest score was 100 and the lowest score was 60, with an average score of 89 with a percentage of 94%.

Based on the results of the researcher's observations and values academic participant educate can seen If in cycle I the indicators of success have been achieved, as a comparison the researcher will carry out evaluation actions in cycle II.



**Figure 1.** Students Completing Evaluation Questions in Cycle I **Figure 2.** Use of Smart Multiplication Congklak



**Figure 3.** Student Finish Question Evaluation in Cycle II **Picture 4.** Media Congklak Multiplication Clever

Based on the evaluation results in cycle II, results were obtained with an average score of 96 presentation 100%. Matter This show results Study in accordance Which expected. The following formula For count average value :

(Zainal Aqib, 2014)

$$x = \frac{\sum X}{N}$$

**Information :**

X = Mark average

$\sum X$  = Amount all mark student

N = Amount student

Following table the results of the calculation of the questions evaluation of activity cycle I & cycle II :

**Table 1.** Results Question Value Cycle Evaluation I & Cycle II

No	Name	Mark Precycle	Evaluation Value	
			Cycle I	Cycle II
1	FFN	60	60	100
2	MLDSP	90	100	100
3	AMM	50	70	100
4	AFA	100	100	100
5	AGC	100	80	100
6	ANM	80	100	100
7	AZB	90	90	100
8	ADRs	100	100	100
9	KSU	90	100	100
10	MZAH	90	100	100
11	NHN	80	90	100
12	NAP	100	100	90
13	RAP	100	90	90
14	vocational school	80	70	70
15	SFR	70	80	100
16	FRA	40	70	70
17	MCA	100	100	100
18	LK	90	90	100
19	LHC	80	100	100
<b>Amount</b>		1590	1690	1820
<b>Average</b>		83.68 →84	88.94 →89	95.78 →96

Following formula Which implemented For count completeness Study :

$$Ketuntasan\ belajar\ klasikal = \frac{\sum\ jumlah\ siswa\ yang\ tuntas\ belajar}{\sum\ jumlah\ siswa\ yang\ mengikuti\ tes} \times 100\%$$

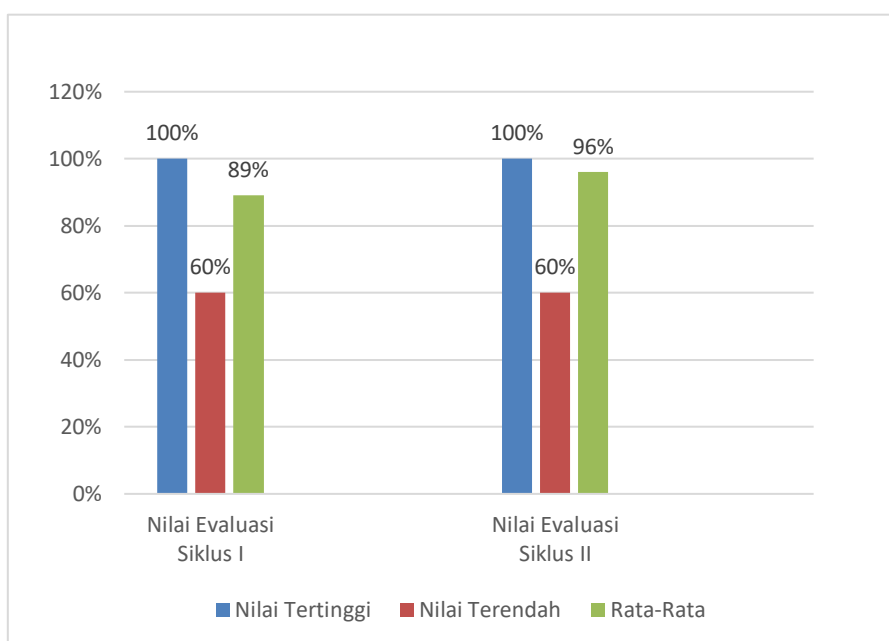
(Mulyasa, 2004)

**Table 2.** Category of student learning outcomes

Value range	Category
80-100	Very good
66-79	Good
56-65	Enough
40-55	Not enough
30-39	Very less

(Mulyasa, 2004)

If poured become diagram stem that is like picture following :

**Diagram 1.** Results of Evaluation Values for Cycle I & Cycle II

Based on t table as well as diagram the Can concluded, mark evaluation at the end cycle I get results calculation mark best 100 and value at least 60 which is the average 89. Whereas mark evaluation on end cycle II get the best score is 100 and the least score is 70 with an average of 96. So, activities cycle I is carried out before the average of cycle II activities is obtained 89% become 96%, so increasing as much 7%.

From results explanation the on activity cycle II results Study student seen Already . Results evaluation cycle I average value 89 with presentation completeness 94%, whereas cycle II flat-flat value 96 with presentation completeness 100%. So that menu n table that sannya indicator success Already reach what has targeted or dreamed of 75% of students getting a score  $\geq 75$ . This could increase due to implementation RME ( *Realistic Mathematics*) approach *Education* ) towards students through the congklak game so that students understand concepts as well as learning outcomes student the more increase.

#### 4. CONCLUSION

Based on the results of research and discussion, you can conclude that the application of the RME approach is difficult through the innovation of the congklak game, understanding the concept of multiplication calculations is achieved in class III elementary school 2 Klaling more increase. From the incident This Can We Look from calculation results precycle get mark best 100 And mark at least 40. While the results evaluation at the end of cycle I get the best score of 100 and a score of at least 60 which are already increase in cycle II with a best score of 100 and a minimum score of 70. For pre-cycle activities the average flat the score is 83 with a completion percentage of 84%, so the success rate is good while the score is average evaluation cycle I obtained 89 with a percentage of 94%, so the success rate was very good. Activity cycle II calculations evaluate the average score is 96 with a completion percentage of 100%, so the success rate is very good too. Thus, from the second result cycle, average value increase as much 7 with presentation completeness 76%. By classic learning Already reach completeness Study Which has expected.

#### BIBLIOGRAPHY

- Azzahroh, F., Supian, A., & Maharani, A. (2022). The Effect of Applying the CTL Learning Method with Congklak Numeracy on Student Interest and Learning Outcomes. *Didactical Proceedings: National Seminar on Elementary Education*, 7 (1), 810–823.
- Flowers, N., Isrok'atun, & Julia. (2016). *Realistic Mathematics Education* Approach to Improve Students' Mathematical Connection and Communication Ability. *Journal of Scientific Pens*, 1 (1), 441–450.
- Bustami, Y., Syafruddin, D., & Afriani, R. (2018). The implementation of contextual learning to enhance biology students' critical thinking skills. *Indonesian Journal of Science Education*, 7 (4), 451–457. <https://doi.org/10.15294/jpii.v7i4.11721>
- Ermawati, D., & Riswari, L.A. (2020). The Influence of the PMRI Approach on Elementary School Students' Mathematical Problem Solving Ability. *National Seminar on Basic Education Educational Transformation Facing Human Resources in the era of society 5.0* (pp. 1-5). Jakarta: Jakarta State University Postgraduate.
- Ermawati, D., & Zuliana, E. (2020). Implementation Of Open-Ended Problems On Mathematical Problem-Solving Skills Of Elementary School Students. *JPSD*, 6(2), 145-157.
- Febriani, P., Widada, W., & Herawaty, D. (2019). The Influence of Ethnomathematics-Based Realistic Mathematics Learning on the Ethnomathematics-Based Realistic Mathematics Learning on the Ability to Understand Mathematical Concepts of Bengkulu City High School Students. *Rafflesia Journal of Mathematics Education*, 4 (2), 120–135. <https://ejournal.unib.ac.id/jpmr/article/view/9761>
- Humairo, V. M., & Amelia, Z. (2021). Improving Early Counting Skills Through Modifying the Form of the Congklak Game. *Integrative Holistic Early Childhood Journal (AUDHI)*, 3 (1), 19. <https://doi.org/10.36722/jaudhi.v3i1.589>
- Indriani, N., Salsabila, ZP, & Firdaus, ANA (2022). Understanding the Concept of Multiplication Using the Rme Method for Class III Miftahul Huda Students. *AULADUNA: Journal of Islamic Basic Education*, 9 (1), 105–113. <https://doi.org/10.24252/auladuna.v9i1a9.2022>
- Khurriyati, AL, Ermawati, D., & Riswari, LA (2022). Increasing the Mathematical Problem Solving Ability of Class III Students through PACAPI Media (Pizza Fraction Board). *JiIP - Scientific Journal of Educational Sciences*, 5 (4), 1028–1034. <https://doi.org/10.54371/jiip.v4i5.497>
- Maliasih, Hartono, & Nurani, P. (2017). Efforts to Increase Learning Motivation and Cognitive Learning Outcomes Through the Teams Games Tournaments Method with Concept Map Strategy for High School Students. *Journal of the Teaching Profession*, 3 (2), 222–226.
- Mei, A., Naja, FY, & Sa'o, S. (2020). Contextually Based Realistic Mathematics Learning for Geometry Material for Class VII Students of Smpn 2 Ende Selatan. *EduMatSains: Journal of Education, Mathematics and Science*, 5 (1), 19–28. <https://doi.org/10.33541/edumatsains.v5i1.1610>
- Mulyasa. (2004). *Implementation of the 2004 Curriculum: KBK Learning Guide*. Bandung: Rosdakarya Youth, 2006.
- Rahayu, WD, Rohaeti, EE, & Yuliani, A. (2018). Analysis of the Mathematical Understanding Ability of MTs Students in West Bandung Regency. *Nusantara Math Educator Journal: A Vehicle for Publication of Scientific Writing in the Field of Mathematics Education*, 4 (1), 79. <https://doi.org/10.29407/jmen.v4i01.11998>
- Rahmawati, DA, Fakhriyah, F., & Ermawati, D. (2021). THE INFLUENCE OF LEARNING FACILITIES ON LEARNING ACHIEVEMENT OF CLASS III STUDENTS OF SDN TAMBAHARJO 02. *Syntax Literate: Indonesian Scientific Journal* 6(8), 3739-3746.
- Rohmatin, T. (2020). Ethnomathematics of the Traditional Game Congklak as a Mathematics Learning

- Technique. *Proceedings of the Basic Sciences Conference* , 2 , 144–150.
- Suminar, DR (2019). *Psychology of Play: Play & Games for Child Development*. Surabaya: Airlangga University Press.
- Suprihatin, E., & Padaela, M. (2019). Teacher Creativity in Improving Group B's Numeracy Skills through the Congklak Game. *REDOMINATE: Journal of Theology...* , 1 (1), 37–48. <http://sttkerussoindonesia.ac.id/e-journal/index.php/redominate/article/view/5>
- Wahyuni, A. (2020). Journal of Mathematics Education. *Journal of Mathematics Education* , 11 (1), 67–76. <http://ojs.uho.ac.id/index.php/jpm>
- Zainal Aqib, SJ (2014). *Classroom Action Research for Elementary, SLB and Kindergarten Teachers*. Bandung: Yrama Widya.