



Card Game Method to Improve the Number of Counting Operations of Elementary School Students in Buru District

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Abstract

This research aims to describe the counting operation capabilities of grade II elementary school students with card game methods. This type of research is classroom action research with Kemmis and Mc Taggart models. The research was conducted at public elementary school (Sekolah Dasar Negeri or "SDN") 1 Teluk Kaiely, SDN 1 Lilialy, and SDN 3 Namlea. Data is collected with tests and observations. Furthermore, the data is analyzed with qualitative and quantitative techniques. The results showed that by using the card game method, the ability to calculate the grade II elementary school students improved from the beginning of the pre-cycle to cycle II. The average value in pre-cycle is 65 with the percentage of 42%. The average value increases to 66, with a percentage of 58%. The average score increased to 78 with the percentage of 81% reach the cut of score in cycle II

Keywords: card game, counting operation, classroom action research

A. Introduction

Today, math learning in school by some people is still considered scary, so it is not uncommon for some students to make various reasons not to follow the classroom's learning. This resulted in much subject matter that students did not know. This, of course, impacts the decline or low score of students' mathematics at the end of each evaluation, causing slow adjustments to the changes that occur (Magfirah, 2020); (Taufik, 2019).

Various factors cause students to dislike maths learning, among others, teachers who give materials still using the old learning method, namely lectures. Students just sit still and calmly listen to the teacher to explain the learning materials. There is no reciprocity between the student and the teacher. Of course, it doesn't make students active. In the end, students will feel bored and saturated with the learning atmosphere.

The learning atmosphere above is still found at the elementary to senior high school levels. It seems that fun learning should be created, starting from the elementary school level, to obtain satisfying learning outcomes (Amir, 2020). Considering elementary school is the beginning of a student getting the basics of various subject matter, one of them is mathematics.

In primary school math subjects, there is a subject matter explaining the operation of the count. The material is indispensable to solve the problems found in daily life that are mathematical. However, most students in elementary school still have difficulty doing such summations. Elementary school students in Buru District also experienced it.

Based on the observations of researchers in grade II, one of the elementary schools in Buru Regency, there are problems with students' weak ability to solve the problems of counting operations. In working on counting operations, many students are less thorough, so the resulting answer is not precise. Therefore, there must be new and exciting learning methods for elementary school students. A method tailored to the state of elementary school children who still like to play. Based on that, the method to be developed is the card game method.

With that method, students are invited to play while studying. It is an effort to convey learning materials to the child by playing or in a fun way so that the child unwittingly acquires knowledge and experience from the easy learning process (Ismail, 2006)

Based on the above problems, this research aims to improve counting operations of elementary school students with card game methods. If this research is not done, it is feared that students' ability to learn mathematics, especially counting operations, will not improve. This will have an impact on the final grades of students remaining low below KKM. Therefore, this research is expected to provide teachers or teachers information about fun and fun learning methods for elementary school students.

B. Literature Review

1. Counting Operation Capabilities

In terms of students, learning is an activity of improving cognitive, affective, and psychomotor abilities (Dimyanti & Mujiono, 2002). Calculated surgery skills are one of the cognitive abilities that students must improve in learning mathematics. Ability is capacity, proficiency, strength (Depdiknas, 2008).

In mathematics, the meaning of "operation" is "workmanship." Calculated operations in mathematics are defined as calculated workmanship. (Eliana, 2016) stated that the calculated or calculated operation includes four essential works, namely summing, subtraction, multiplication, and division. The four essential workmanship is also a binary operation. Binary operations are operations involving only two numbers or two elements (Shamsudin, 2002). A binary operation is to take two numbers ("bi" meaning two) to get the third number (Nugroho, 2017). For example, if the binary operation selected is a summation and we start with two numbers 2 and 3, the third number will be 5.

The basic system of counting operations consist of four, namely, summing, subtraction, multiplication, and division. The four systems are interconnected basic workmanship, so mastery of one operation will affect the other operation. Mastery of this operation includes understanding the concept and skills of performing operations (Subarinah, 2006).

2. Game Methods

Teachers organize the learning process to teach students how to learn to acquire and process knowledge, skills, and attitudes (Dimyanti, & Mujiono, 2002). Such learning is in accordance with the three main principles of learning expressed by Jean Piaget, namely active learning, learning through social interaction, and learning through his own experience (Sugandi, 2004).

Gaming is an activity restricted by the medium that accompanies students' cognitive development (Santrock, 2007). Play allows children to practice their competencies and skills in a relaxed and fun way. Piaget believes that cognitive structure needs to be trained, and the game is the perfect setting for this exercise. Santrock (2007) describes the game as a fun and fun activity because the game satisfies the explored impulses we all have. This impulse involves curiosity and a desire for information about something new or unusual.

The game is an act that contains preoccupation and is done on its own will, free without coercion, with the aim of getting pleasure at the time of doing the activity (Pitadjeng, 2006). The method of play is a way of teaching implemented in the form of a game. The method of the game is a practice technique. The game is the same as role-playing. The only difference is that the participants have to work and interact with each other, so it requires more preparation.

According to Sudjana (2010), the advantage of the game method is to cultivate excitement and not exhaust in learning; competition and want to win felt by the learners; can use tools that are easy to get in the local area, cheap and easy to use; rewards for winners are felt directly; and joint assessment by observers and players.

3. Number Card Game

Cards are one of the objects that can be used as educational games. Card media packed in the form of educational games is expected to make the learning process more interesting, and students are actively involved in learning activities (Budihartanti, 2011). A number card is a card made of thick, rectangular paper, which is inscribed with a number. Number card game media is an intermediary tool used in the game using paper formed according to the needs consisting of a collection of several numbers containing meanings to achieve the goal of learning (Muin, 2012).

The number card in this study was made with manila paper measuring 10 x 8 cm. The number card game is done with the following rules:

- a. The card is divided out to all members of the group, leaves one to start the game. Students are looking for an open pair of cards.
- b. Students who have a pair of cards open to put the next card.
- c. Then students look for the next pair of cards, so on until one of the students runs out of cards.
- d. Students whose cards are exhausted for the first time are declared winners.
- e. The game can be repeated several times, so the winner is not just one child.

Domino Numbers card game is a card shaped like a domino card. Domino cards are a type of game that can be done on the floor or on a table using 28 pieces of wood or paper (Taufiqurrohman, 2012). The two-square number card game includes one-on-one pairing activities (Pitadjeng, 2006). In general, one two-square game device consists of 28 cards, but the number of cards can be changed as needed. The material used as a base is thick paper, such as cardboard or manila paper. How to create: draw a series of 2 squares on manila paper or cardboard with a size of 3 x 6 cm as many as 28 images (congruent), or as needed. Cut it according to its shape, i.e., a rectangle with a comparison of length size: width = 2..

4. The influence of game methods on the ability of calculated operations

More and more educators and psychologists believe that preschoolers and elementary schools learn best through active and participatory teaching methods, such as games and drama (Santrock, 2007). By actively participating in learning, children are expected to understand the materials taught more easily. In Ismail (2006), children's education experts in their research say that the most effective way of learning children is in children's games, namely by playing in their teaching activities. Playing as a form of learning activity is a creative, fun, and educational play (Ismail, 2006). The game method is a method of learning packaged in the form of a game. By applying the game method in learning will create a fun learning atmosphere. The math game is very important because the mathematical calculation operation in the game shows concrete rules and further guides and sharpens the understanding of mathematics in the students (Pitadjeng, 2006).

C. Method

1. Research Design

This research is a classroom action research (PTK), which in English terms, is called Classroom Action Research. Classroom action research focuses on the class or on the teaching and learning process that occurs in the classroom. CAR can be interpreted as an effort to improve the learning process or solve problems faced in learning (Mulyasa, 2010).

2. Research Locations and Research Subjects

This research was conducted at SD in three sub-districts in Buru Regency, namely SD Negeri 1 Teluk Kaiely in Kaiely District, SD Negeri 3 Namlea in Namlea District, and SD Negeri 1 Lilly in Liliy District. Meanwhile, the subjects in this study were 2nd-grade elementary school students in the three schools.

3. Research Model

The Classroom Action Research Model used in this study is the model of Kemmis and Mc Taggart (1992) with a cycle that is repeated and continuous (spiral cycle), namely the learning process that increases the achievement of results. Kemmis and Mc Taggart unite the components of action (acting) and observation (observing) as one unit. The components of action (acting) and observation (observing) are made into one unit because the two activities cannot be separated and must be carried out at the same time.

4. Data collection technique

Data collection techniques are the most important step in research because the research's main purpose is to obtain data (Sugiyono, 2009). This research data comes from researchers' interaction using the card game method to improve the ability of count operations. In this study, the data collection techniques used were tests and observations.

a. Test

The test used in this study is a written test. The written test assessment aims to measure students' arithmetic operations skills. Students are given a written test at the end of each cycle to determine the effectiveness of the action by referring to the predetermined success indicators.

b. Observation

In this study, observations or observations were made to determine teachers' and students' activities during the learning process. The observations made in this study were collaborative observations. In the implementation of classroom observations, observers observe teachers and students' activities in the learning fellow teacher-researchers.

5. Data analysis technique

The data obtained in this study were in the form of observation sheets during the learning process and each student's test scores. The data analysis techniques used to process the data are:

a. Qualitative Analysis

Data from the observation of student activities during the learning process of counting operations using the game method resulted in qualitative data. This data analysis technique consists of three activities simultaneously: data reduction, data presentation, and drawing conclusions or verification. Data reduction is the activity of selecting data, simplifying data, and transforming crude data from observational records. The reduction results are in the form of a brief description, which has been classified into a particular activity. The presentation of data is a collection of information in the form of narrative text, which is arranged, arranged, summarized in the form of categories so that it is easy to understand the meaning contained in it.

b. Quantitative Analysis

Student test results were analyzed descriptively quantitatively. In each assessment, the average value is calculated. The average pre-action test score is obtained, namely the written test score in cycle I and the average value of the written test in cycle II. Then the student's average test results are described. If the student's test results increase according to the predetermined standard values, it is assumed that applying the card game method can improve the students' numeracy operations ability. To find the average (mean) using the formula:

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

M = average (mean), $\sum X$ = total value, N = number of students.

The formula for calculating the percentage of successful learning is as follows:

$$P = \frac{F}{N} \times 100\%$$

P = percentage number, F = number of students who reach $\geq$ KKM score, N = number of research subjects

D. Findings and Discussion

This Classroom Action Research (CAR) was conducted in three sub-districts in Buru Regency, namely SD Negeri 1 Teluk Kaiyeli in Kaiyeli District, SD Negeri 3 Namlea in Namlea District, and SD Negeri 1 Liliyal in Liliyal District. This study aims to improve students' arithmetic operations skills by using the card game method. This research action was carried out in 2 cycles consisting of 2 meetings each cycle. Each meeting consists of 2 hours of lessons.

This research was conducted during the Covid-19 pandemic, which prohibited large numbers of public gatherings, including learning in schools, so the analysis was carried out by prioritizing health protocols. The health protocol implemented in accordance with government regulations is to form a study group for a maximum of 6 students with teachers and researchers. This study involved 6 study groups with a total of 36 students from 3 schools.

Another action is to use a mask and maintain a safe distance by both the researcher and the teacher and the students as research subjects. Learning is carried out at the teacher's or student's house based on a schedule agreed upon by the school and the parents.

1. Pre-Cycle Condition

Pre-cycle activities were carried out by observation and pre-test with the aim of obtaining data about student learning outcomes in mathematics lessons. From the observations, it was found that learning was dominated by teachers, and students were not directly involved in learning. The teacher provides the material, followed by giving examples of questions. This condition results in students being passive and unable to absorb the material well. This is shown by the students' 'initial tests' results with the lowest score of 20 and the highest of 100. The students' scores during the pre-test are presented in the following Table 1.

Table 1. Frequency distribution of learning outcomes in cycle 1

No.	Score	Frequency	Cumulative Frequency	Cumulative Percent
1	20	1	1	2,78%
2	30	4	5	13,89%
3	45	3	8	22,22%
4	50	3	11	30,56%
5	60	4	15	41,67%
6	65	6	21	58,33%
7	80	4	25	69,44%
8	85	1	26	72,22%
9	95	8	34	94,44%
10	100	2	36	100%

Based on Table 1, it is known that students who fulfill the KKM with a value are 15 people or 41.67% less than students who do not meet the KKM, namely 21 students or 58.33%. The initial test scores are presented in the following Table 2.

Table 2. Pre-Cycle Student Test Scores

Interval Class	Category	Total students
81-100	Very good	11
61-80	Well	10
41-60	Enough	10
≤ 40	Failed	5

Based on the results of the preliminary tests in the pre-cycle, it was seen that the students' ability to solve arithmetic operations needed to be improved. Therefore, actions were taken to improve students' numeracy skills in elementary schools in three sub-districts in Buru Regency.

2. Cycle 1

The conditions that occur in the pre-cycle stage are used as reference data in the implementation of cycle 1. This is done to obtain an increase in students' numeracy operations ability.

Learning activities using the card game method are carried out in small groups. There are two types of card games to support this learning method, namely the number card game and the number domi card. In the number card game, students are assigned to match the form of addition according to the form of multiplication. Meanwhile, in some numbers, students use cards as in dominoes by playing while looking for the product of multiplication. With this method, students are very excited and enthusiastic about doing it.

Based on the results of the implementation of the first cycle, the students' average score increased to 66, with the highest score being 100 and the lowest being 33. The following is presented in the Table 3.

Table 3. Frequency distribution of learning outcomes in cycle 1

No.	Score	Frequency	Cumulative Frequency	Cumulative Percent
1	33	3	3	8
2	40	8	11	31
3	47	1	12	33
4	60	3	15	42
5	67	7	22	61
6	80	3	25	69
7	87	1	26	72
8	93	7	33	92
9	100	3	36	100

Based on the Table 3, it can be seen that those who have fulfilled the KKM with a score are 21 students (58%), while those who have not fulfilled the KKM with a value are 15 students (42%). The criteria for evaluating the arithmetic operations ability of class II SD students in Namlea in cycle I described in the following Table 4.

Table 4. Student Test Scores in Cycle I

Interval Class	Category	Total students
81-100	Very good	11
61-80	Well	10
41-60	Enough	4
≤ 40	Failed	11

The following is a comparison of the values between pre-cycle and cycle I, which is described in the Table 5.

Table 5. Comparison of Pre-Cycle and Cycle I Values

Aspects Observed	Pre Cycle Value	Cycle I Value
The highest score	100	100
Lowest Value	21	33
Average value	65	66
Percentage of students who have reached the KKM	42%	58%

From the Table 5, it can be concluded that the students' scores when compared between the pre-cycle and the first cycle experienced a slight increase. This increase is the average score from 65 to 66 or only 1 point, and the percentage of students who have reached the KKM increased from 42% to 58% or 16%. However, there is an increase in the number of students who fall into the criteria for failure, namely in the pre-cycle, only 5 students increased to 11 students in the

second cycle. The increase that occurred was not satisfactory and had not yet reached the goal of the percentage of KKM achievement.

Based on the results of observations in cycle I, students were more enthusiastic about the learning that was presented while playing. Giving different perceptions and delivery of material makes students look more focused and attracts their curiosity towards learning. However, there are several obstacles faced by teachers and researchers. These obstacles include students having a little difficulty understanding the rules of the game so that the teacher has to explain repeatedly. This took up a lot of lesson time at the first meeting, so that the learning time was not enough. This did not happen again at meeting 2 because the students understood the game better. In addition, there are only a few children in one group, so that they can only form a maximum of 2 study groups to compete in card games. This makes the game less intense. The constraints that occurred in the first cycle were then reflected by the researcher so that they could be fixed in the next cycle with the hope of an increase in the ability of students to count operations in order to achieve the expected learning completeness.

3. Cycle 2

The data obtained in cycle I is used as a reference in implementing actions in cycle II so that the research objectives to improve students' arithmetic operations can be achieved. In cycle II, at the first meeting, students were introduced to the daikon game. Dakon is a game that uses the concept of division as a result of repeated subtraction and an appropriate form of repeated subtraction. Students compete to solve several questions in the way of repeated subtraction using daikon and the teacher records the results. At meeting 2, each student is given a card containing multiplication and division that has not yet been shown. The student answers the card then looks for a friend who has a card with a division or multiplication, which is the opposite of hers. The group that was formed was then given the task of matching expansion and the form of division.

After being analyzed, the results of the evaluation in cycle II showed an average of 78, with the highest score being 100 and the lowest being 42. The following is presented in the Table 6.

Table 6. Frequency distribution of learning outcomes in cycle II

No.	Score	Frequency	Cumulative Frequency	Cumulative Percent
1	42	4	4	11
2	50	1	5	14
3	58	2	7	19
4	67	5	12	33
5	75	6	18	50
6	83	3	21	58
7	92	7	28	78
8	100	8	36	100

Based on the Table 6, it can be seen that those who have met the KKM with a score are 29 students (81%), while those who have not fulfilled the KKM with a value are 7 students (7%).

Criteria for the results of evaluating the arithmetic operations ability of class II SD students in Namlea in cycle II are described in the following Table 7.

Table 7. Student Test Score Cycle II

Interval Class	Category	Total students
81-100	Very good	18
61-80	Well	11
41-60	Enough	7
≤ 40	Failed	0

The following is a comparison of the values between cycle I and cycle II, which is described in Table 8.

Table 8. Comparison of Cycle I and II Values

Aspects Observed	Cycle I Value	Cycle II Value
The highest score	100	100
Lowest Value	33	42
Average value	66	78
Percentage of students who have reached the cut of score	58%	81%

From the Table 8, it can be concluded that the students' scores when compared between pre-cycle and cycle II experienced a lot of improvement. This increase is the average value from 66 to 78 or 12 points. Besides, there was an increase in the quantity of students who got a score of 100, and there were no students who were in the failing category. The lowest score also increased from 33 to 42. The percentage of students who had reached the KKM risen from 58% to 81% or 23%. The percentage of students in achieving KKM has exceeded the target of the researcher, which is 75%.

Based on the observations of researchers, learning activities in cycle II were active and fun. Students often ask questions and can answer questions from the teacher. Learning activities are no longer teacher-centered but student-centered. Less learning time in cycle I was overcome by limiting playing time. The constraint of the limited number of students so that it is not competitive is overcome by individual and pair play so that learning can take place effectively and efficiently. The learning outcomes of the arithmetic operation ability in cycle II have reached the research indicators with an average of 75 and completeness of 86%. Therefore, the research was declared successful and was not continued to cycle III.

The increase in research from pre-cycle to cycle I then to cycle II will be described in Table 9.

Table 9. Comparison of Pre-Cycle, Cycle I, and II Cycle Values

Aspects Observed	Score		
	Pre-Cycle Value	Cycle I Value	Cycle II Value
The highest score	100	100	100
Lowest score	20	33	42
Average score	65	66	78
Percentage of students who have reaches the cut of score	42%	58%	81%

From the Table 9, it can be seen that the students' scores from the beginning to the second cycle continued to experience a good increase. This indicates that students are starting to be active and enthusiastic in learning to count using the card game method.

E. Conclusion

Based on the results of the research and discussion, several things were concluded, namely in the pre-cycle stage, the evaluation results showed the highest score was 100, and the lowest score was 21, with an average value of 65. The percentage of achievement of the minimum completeness criteria was only 42%. In the first cycle stage, learning is carried out using a game method, namely card games, and some numbers. The evaluation results show the highest score is 100, and the lowest score is 33, with the average score being 66 and the percentage of completeness criteria achievement of at least 58%. In the second cycle stage, learning is carried out with the game method using game tools and objects that are familiar to students. The evaluation results showed the highest score was 100, and the lowest score was 42, with the average score increasing to 78 and the percentage of achieving the minimum completeness criteria increasing to 81%.

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