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## **Use of Figure Tools to Increase Mathematics Result Learning Student Class V Prymary School 101796 Patumbak**

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### **Abstract**

The problem in this research is the result of learning mathematics students less than the maximum. This study aims to investigate the implementation of teaching and student learning outcomes after learning improvements implemented by using props in Mathematics. The instrument used was a test in the form of description is limited to the cognitive level C2 and observation sheet that is for the activities of teachers and students' activity during the learning process. The results showed that the first cycle of the implementation of learning activities of teachers is 41 (68.33%) and student activity reached 24 (66.66%) with unfavorable category, on the second cycle increased to 53 (88.33%) in the activity of teachers and 32 (88.89%) in the student activity by either category. While the results of the average student's score on the first cycle of 58.50 increased to 71.27 in the second cycle. The result showed that the implementation of learning has been included in good category and mathematics learning outcomes improved after use of props on the subject of the sum of fractions mixture.

**Keywords:** Learning Outcomes; Viewer Tool.

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## **1. Introduction**

Education is the first step for the progress of a country. Education is making national life in realizing the advanced society and able to face the challenges of globalization, so that by itself every citizen is able to develop themselves as human beings. One of the demands in education, which is loaded with this technology is the ability of human resources in mathematics. Mathematics is a subject that is important, because mathematics has a great subangsih in the world of education to the development of logical thinking ability of students, creative and useful in order to establish human resources qualified and capable competitiveness in the future. But the reality today, student mastery of the math is still very low. Many students view mathematics as a field of study that is the most difficult. Lack of student mastery of the math, affect the study results. Furthermore Liebeck cited by [1] states that "There are two kinds of mathematics learning outcomes that must be mastered by the student: Mathematical calculations (mathematics calculation) and mathematical reasoning (mathematics reasoning)". According to information from the teacher in class V SDN Patumbak 101 796, with the number of students 22 people, male students amounted to 14 people and women amounted to 8 people, the average value of learning mathematics only reached 57.8 while ketuntasannya value reaches 60, it this is because the lack of students' understanding of math. For the success rate of students in the study of mathematics, only 8 students (36%) of the 22 students who completed study results have not been successful while 14 (64%).

Many factors affect the maximal results of students 'mathematics learning, among others, teachers are still learning in one direction, the lack of students' understanding of mathematics, unqualified students to work on the problems related to math and the use of props is not maximized in the learning of mathematics. Therefore teachers need to pursue efforts to meningkatkannya mathematics student learning outcomes. One effort that is expected to improve the ability of students is through the use of props. The use of props is expected to improve, help, and clarify the abstract concepts in order to become concrete. Props will stimulate interest as well as accelerate the process of understanding the learner in the learning process will be more rapid understanding and increased when mendapatkan things that are abstract and difficult to understand. Goodness props for learning also makes it more vibrant because of the patterns of learning are varied. Learning with props digestible compared to learning that is verbalistic. The use of props, making the students will be able to solve the problem by observing, analyzing and verifying integrated manner.

Learning is the basis of development of human life, because by studying humans are able to make changes in her. The changes are characterized by the development of knowledge, attitudes, skills, and ultimately be expected to solve the problems in his life. Therefore, a person is said to be learning, if it can be assumed in him there is a process that results in a change in behavior. Reference [1] states that "Learning is a process of an individual who seeks to achieve the learning objectives or so-called learning outcomes, which is a form of behavior change relatively sedentary". According [2] states that "Learning is an individual process attempts to obtain a new behavior changes as a whole, as a result of the individual's own experience in interaction with the environment".

Another related definition of learning is expressed by Howard L. Kingskey cited by [3] that "Learning is a process where behavior (in the broad sense) generated or modified through practice or training" . Morgan [4]

states that "Learning is a relatively permanent any changes in the behavior that occurs as a result of training or experience" .Meanwhile, according to Winkel [5] states that "Learning is a mental activity / psychic that takes place in an active interaction with the environment that result in changes in the knowledge, skills and attitudes" . Gagne [6] revealed: "Learning is a complex activity. Learning outcomes in the form of capability. After learning the skills, knowledge, attitudes and values. The emergence of these capabilities are: (1) the stimulus that comes from the environment; and (2) the cognitive process undertaken by learners".

Learning is a process to gain from learning the knowledge, skills, attitudes and values through practice or exercise with the environment. Learning is a process that occurs due to the interaction between man and his environment. As contained in Law No. 20 of 2003 [7] states that "Learning is a process of interaction of learners with educators and learning resources in a learning environment" [4]. Another related definition of learning is expressed by Isjoni (2011: 11) that "learning is something that is done by the students is not made for students, learning is essentially an attempt educators to assist students in carrying out a process of learning" .While other definitions of learning is expressed by [6] is "Activities programmed teachers in instructional design, to make students active learning, which emphasizes learning resources" .

Based on these definitions above, it can be concluded that learning is a process of interaction between educators with learners and learning resources, which is programmed on the learning environment. Winkel [8] argues that "learning outcomes are changes that led man to change in attitudes and behavior". While A. J Romiszowski [1] says that "The learning result is output(*outputs*) of a system pemrosesan insert (*inputs*). Enter from the system in the form of an assortment of information, while the output is an act or performance(*performance*). The learning result is a change in behavior that occurs in students as a result of learning to achieve mastery over a number of cognitive, affective and psychomotor in the learning process.

Learning media is defined as all objects that become intermediaries in the learning. Based on the function of media can take the form of props and equipment. The props are part of the teaching medium containing or brought from concepts learned. With props, abstract things that can be presented in the form of a model in the form of concrete objects that can be seen, held, in turn swivel so easier to understand. Estiningsih cited by [9] states that: "The props are media that contain or bring traits concepts learned" . The main function is to lower props abstractness of the concept, so that students are able to capture the true meaning of concepts learned. With the help of appropriate props, students can understand the basic ideas underlying concept, know how to prove and can draw a conclusion from observations. Props is a tool used by teachers to clarify the learning material to be easily understood by students, so the students' learning process more effective and efficient. [3] states that there are six steps that can be taken at a time of teaching, using the media (props), namely: "(1) To formulate teaching purposes, (2) Select and set the media, (3) Preparation class ( 4) Step lesson presentation and use of the media, (5) Measures of student learning activities, (6) Step evaluation of teaching. "

## 2. Methods

This study was conducted in primary schools 101 796 Patumbak. This study was conducted to improve student learning outcomes with the use of props. This study was conducted 2 cycles, the first cycle and the second cycle

and have the same time the allocation of 2x35 minutes (1meeting). In each cycle will be various phases, from planning, implementation, observation and reflection. The activities carried out in the first cycle are the researchers came to school for permission to research and find the observer or fifth grade elementary mathematics teachers to be able to teach the class. Then the researchers conducted the study in the classroom to give students the motivation and apperception in advance for 5 minutes. Furthermore, within 50 minutes, the researchers conducting student learning by distributing books and worksheets, explaining the material mixture using a fractional sum of props, doing worksheets, observer to observe the activities of teachers and students as well as holding the conclusion of the study. The end of the study, researchers gave test results to learn as much as 4 about to be done for 12 minutes. After learning is completed investigators shut learning by motivating students to learn.

After the first cycle is completed, researchers reflect on the learning that has taken place. In a reflection is found that the activity of the teacher and student activity in the unfavorable category. Thus, researchers are looking for obstacles that occur. These constraints include the activities of teachers, teachers are less able to open the lesson, the accuracy of using the media, to answer the questions of students and the use of time allocation. While on the activity, students are still not ready to accept learning about the quality of the test Learning Outcomes and LKS is very high, and liveliness during the learning is still lacking. To fix the problems in the learning process, the researchers make improvements to the next cycle to create a new worksheet with a much simpler matter. Stages of the activities carried out in the second cycle is the same as the first cycle, but the implementation is done in the second cycle that is completed the obstacles that occur in cycle I. In the second cycle is completed, the results of the observation sheet teacher activity and student activity in both categories. Obstacles encountered in the first cycle does not happen again cycled II activities of teacher and student activities, the improvement of the learning is not necessary to the next cycle.

### **3. Result**

Based on the stage of data collection, the data from the results of the research are: (1) The results of observation the activities of teachers and students of the first cycle, (2) Value Results mathematics learning cycle I, (3) Complete Learning Outcomes Cycle I, (4) observations activity of teachers and students of the second cycle (5) The value of the results of students' mathematics learning cycle II, (6) Complete results of student learning cycle II, (7) the results of teacher activity observation cycle I and cycle II, (8) the results of student activity observation the first cycle and the second cycle, (9) Complete results of student learning first cycle and the second cycle, and (10) average value of student learning outcomes first cycle and the second cycle. The description of these data is as follows:

#### **1) Observations Activities Teachers and Students First cycle**

Observations conducted by the observer (teacher math class V SD), observations (observation) implementation of learning activities of teachers and students carried out starting from the early implementation of the action until the end of the action, be teaching by using props on the subject of the sum of fractions mixture. Results of observation activity of teachers and students activities in learning in the first cycle are presented in the

following table.

**Table 1:** Results of Observation Activities Teachers and Students First cycle

Activities	AmountScore	Percentage	Category
Master	41	68.33%	Less good
	24	66.66student%	Less good

From Table 1 it can be seen that the number of scores obtained on each activity and the activity of the teacher's activities students cycle I was 41 (68.33%) and 24 (66.66%) and excluding the unfavorable category. So it can be stated that the conduct of research still to be repaired.

2) **Value Math Student Learning Outcomes Cycle I**

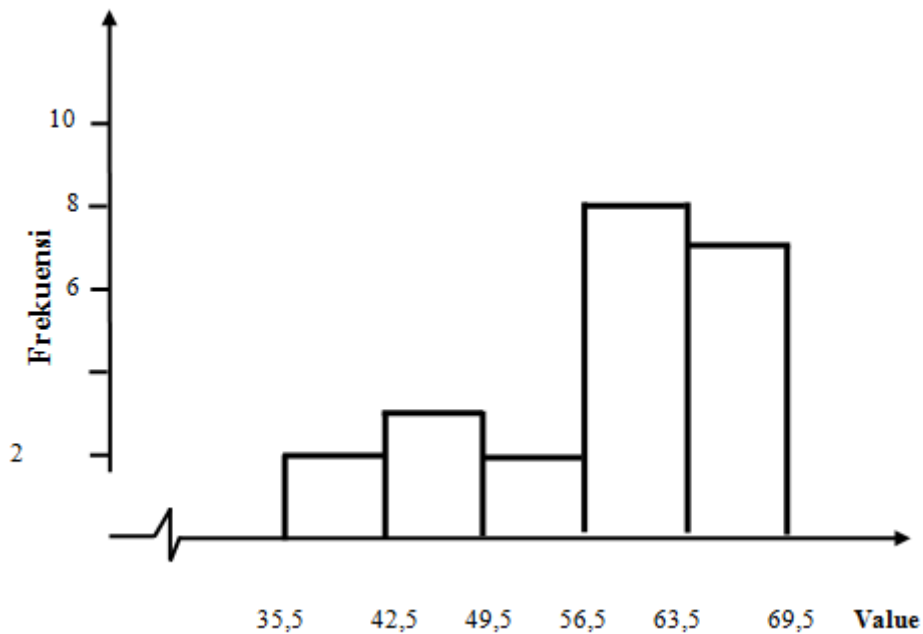
Value the results of students' mathematics learning cycle I served on the frequency distribution table values student learning outcomes as follows:

**Table 2:** Value of Learning Outcomes in Mathematics in Mixed Fractions Summation Highlights First cycle

No	Interval Grade	$f_{absolut}$	$f_{relatif}$ $f_{relatif}$ (%)
1	36-42	2	9.10
2	43-49	3	13.63
3	50-56	2	9.10
4	57-63	8	36.36
5	64-70	7	31.81
<b>Total</b>		<b>22</b>	<b>100</b>

The results were obtained average results of students' mathematics learning in summation material fractions obtained mixture 58.50 . Based on Table 2 can be seen that the number of students that scored above the average of 7 students (31.81%), while the number of students is below the average of 7 students (31.83%).

Picture of the value of students' mathematics learning outcomes, can be presented through the histogram graph below:



**Figure 1:** Value Histogram Mathematics Learning Outcomes First cycle on Highlights Mixed Fractions Summation

3) **Mastery Learning Outcomes First cycle**

Learning outcomes of students can be seen on the completeness individual student learning and classical. To determine the completeness of students in the first cycle, can be seen in the following table.

**Table 3:** Mastery Learning Outcomes Cycle I

Criteria	f	Percentage (%)
Completed	14	63.64
Not Completed	8	36.36
<b>Total</b>	<b>22</b>	<b>100</b>

Based on the criteria of completeness of student learning outcomes, then from Table 3 it can be seen that the value of student learning outcomes in the first cycle have been completed individually, but it was not finished in the classical. It can be seen in the table above, a total of 14 students (63.64%) out of 22 students have completed their study and who did not complete their study as much as 8 students (36.36%). Meanwhile, classical completeness that if a class there are 85% of students who have completed studies. It can be concluded that learning with the use of props on the subject of the sum of fractions unfinished mix classical and can proceed to

the next cycle.

4) **Observations Teacher and Student Activity II Cycle**

Observation (observation) the activities of teachers and students in the second cycle activities conducted from the beginning of the implementation of the action until the end of the action, in the form of lectures with visual aids on the subject of the sum of fractions mixture.

Results of observation teacher activity and activity students of in the second cycle are presented in the following table:

**Table 4:** Observations Teacher and Student Activities Cycle II

Activity	Total Score	Percentage (%)	Category
Master	53	88.33%	Good
Student	32	88.89%	Good

From Table 4 it can be seen that the number of scores obtained on each activity the activities of teachers and student activity cycle II was 53 (88.33%) and 32 (88.89%), and includes both categories.

5) **Value Math Student Learning Outcomes Cycle II**

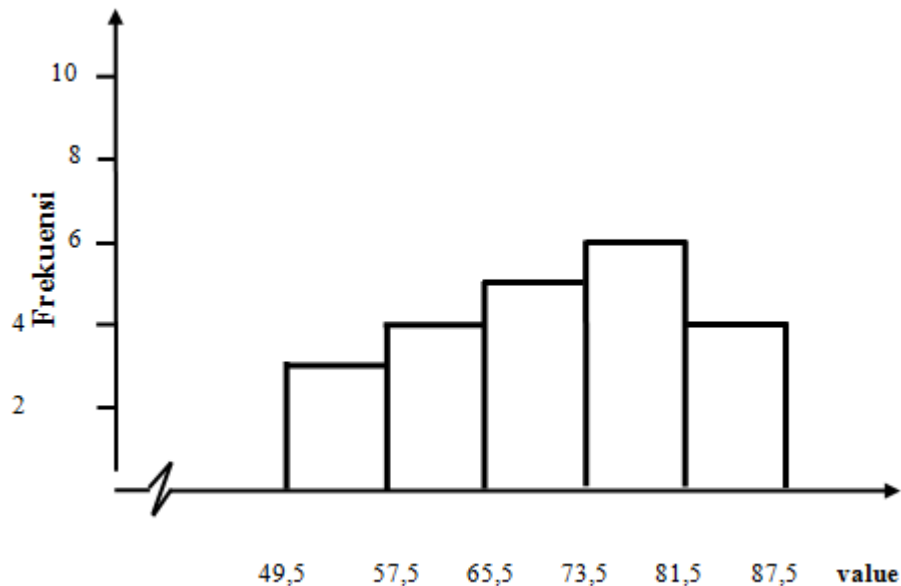
Value of mathematics learning results are presented in Table II cycle of a frequency distribution of the value of student learning outcomes as follows:

**Table 5:** Values Learning Outcomes Highlights Math Students in Cycle II Addition of Fractions Mixed

No.	Interval Grade	$f_{absolut}$	$f_{relatif}$ $f_{relatif}$ (%)
1	50-57	3	13.64
2	58-65	4	18.18
3	66-73	5	22.73
4	74-81	6	27.27
5	82-89	4	18.18
<b>Total</b>		<b>22</b>	<b>100</b>

From the results obtained by the average value of the results of students' mathematics learning in summation material fractions obtained mixture 71.27 (can be seen in appendix 26, case 124). Based on Table 5 it can be seen that the number of students that scored above the average of 10 students (45.45%), while the number of students is below the average of 7 students (31.82%).

Idea of the value of student learning outcomes, can be presented through the histogram graph below:



**Figure 2:** Histogram Values Learning Outcomes Mathematics Highlights Mixed Fractions Summation

6) **Mastery Learning Outcomes Cycle II**

Values student learning outcomes can be seen from the mastery learning students individually and classical. To determine the completeness of students in the second cycle, can be seen in the following.

**Table 6:** Mastery Learning Outcomes Cycle II

Criteria	f	Percentage (%)
Completed	19	86.36
Not Completed	3	13.64
<b>Total</b>	<b>22</b>	<b>100</b>

Based on Table 6 it can be seen that the number of students who pass as many as 19 students (86.36%) out of 22 students, while not exhaustive study as much as 3 students (13.64%).

7) **Observations Teacher Activity Cycle I and Cycle II**



Improved teacher activity observation result in the first cycle and the second cycle is described in the following table.

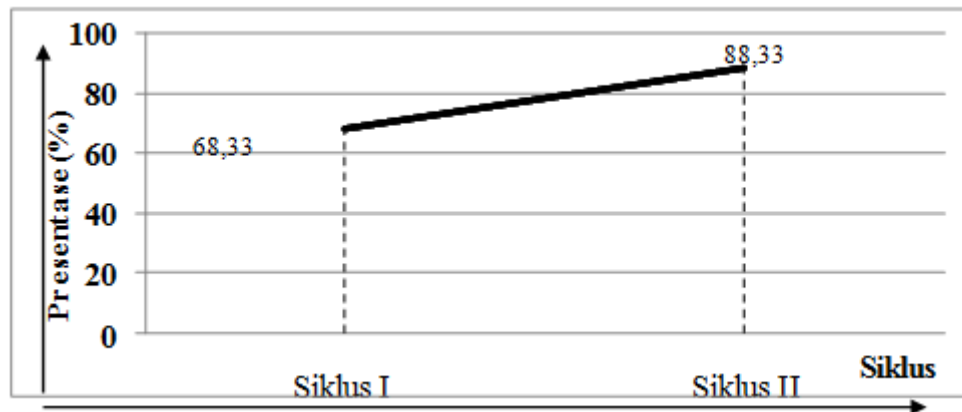
**Table 7:** Observations Teacher Activity Cycle I andII Sklus

Cycle	Total Score	ObservationsScore	Percentage (%)	Category
I	60	41	68.33	Less well
II	60	53	88.33	Neither

From table 7 can be extracted, the observation of the activities of teachers in the first cycle and the second cycle increased.

This looks at the percentage of the results of observations on the first cycle of 68.33% (unfavorable category) and the second cycle on the observation percentage increased to 88.33% (both categories).

Improved results of observations of the unfavorable category into the category of good can be said that the implementation of learning has been successfully implemented. For more details can be seen in the figure below the line diagram:



**Figure 3:** Outline Teacher Activity Observations on the first cycle and the second cycle

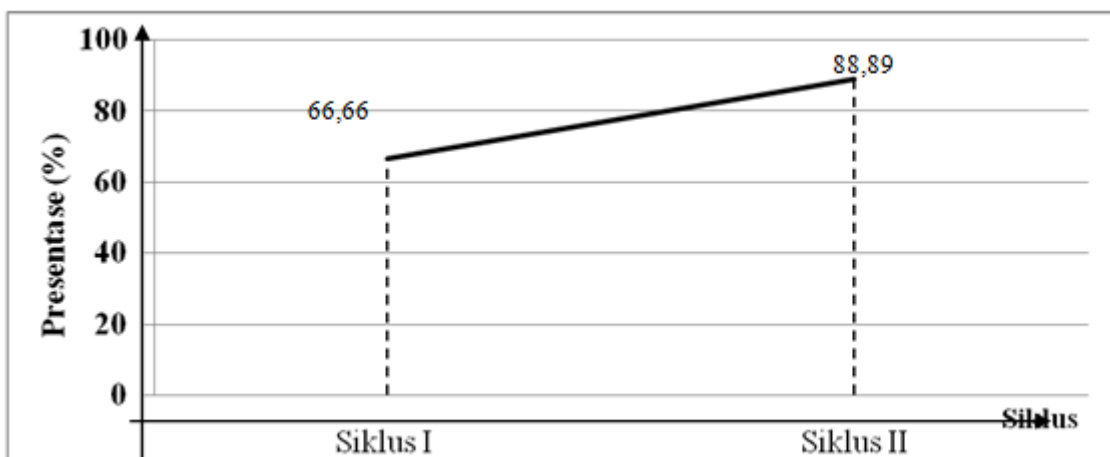
8) **Observations Student Activity Cycle I and Cycle II**

Increased student activity observation result in the first cycle and the second cycle is described in the table berikut:

**Table 8:** Observations Student Activity Cycle I and Sklus II

Cycle	Total Score	observationsS core	Percentage (%)	Category
I	36	24	66.66	Less well
II	36	32	88.89	Neither

From Table 8 can be described, the observation of student activity in the first cycle and the second cycle increased. This looks at the percentage of the results of observations on the first cycle of 66.66% (unfavorable category) and the second cycle on the observation percentage increased to 88.89% (both categories). Improved results of observations of the unfavorable category into the category of good can be said that the implementation of learning has been successfully implemented. For more details can be seen in the figure below the line diagram:



**Figure 4:** Diagrams of Observations Activities Students in Cycle I and Cycle II

**Mastery Learning Outcomes Cycle I and Cycle II**

Enhancement completeness Mathematics learning outcomes of students in the first cycle and the second cycle is described in the following table:

**Table 9:** mastery Math Student Learning Outcomes cycle I and cycle II

cycle	Completed Student		Student Not Completed	
	F	Percentage	f	Percentage
I	14	63.64%	8	36.36%
II	19	86.36%	3	13 64%

In table 9 it can be seen that the number of students who completed the first cycle as many as 14 people (63.64%) and who did not complete their study of 8 persons (36.36), while in the second cycle the number of students who completed their study increased to 19 (86.36%) and the number of students who did not complete their study decreased by 5 votes to 3 votes (13.64%). So it can be stated that learning with the use of props on the subject of the sum of fractions mixture is complete, both individually and classically klasikal. Peningkatan can be described in a line chart as follows:

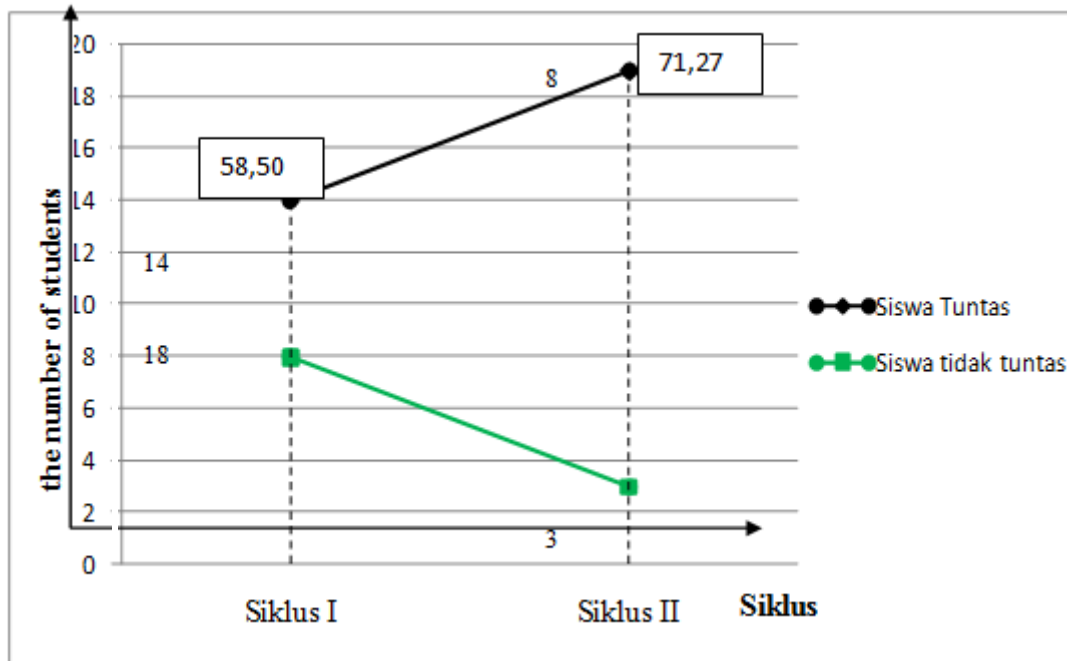


Figure 5: Diagrams of Mastery Learning Outcomes Cycle I and Cycle II

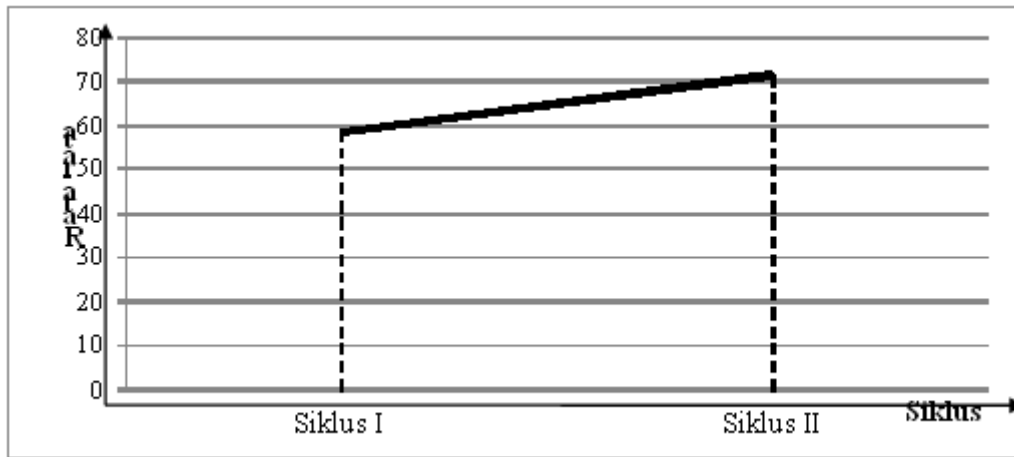
9) **Average Values Learning Outcomes Cycle I and Cycle II.**

Increase in the average value of student learning outcomes in the first cycle and the second cycle, described in the following table:

Table 10: Average Student Learning Outcomes Values in Cycle I and II Sklus

Cycle	average
I	58.50
II	71.27

Based on table 10 it can be seen that the average value of student learning outcomes cycle I is 58.50, while the second cycle of the average value of student learning outcomes is increased to 71.27. Thus it can be said that by using props on the subject of the sum of fractions mixture of mathematics learning outcomes have improved. Such improvements, can be depicted in a line chart as follows:



**Figure 6:** Diagrams Average Student Results Cycle I and Cycle II

### 3. Discussion

Education in Indonesia consists of various levels of education, ie preschool, elementary school, middle school, and higher education. Primary Schools have an important role in improving the quality of human resources for primary schools is one of the institutions that develop students' potential in cognitive, affective and psychomotor aspects. Basically learning in primary schools is a concrete learning seen from the development of children of primary school age. This is in line with that proposed by Piaget [10], that are developmentally think elementary school students are in the Concrete Operational stage ie 7-11 years of age. Carry as a main pillar to improve the quality of human resources in the younger generation, a teacher must prepare and plan learning as well as possible. Teachers play a major role in realizing the successful achievement of learning objectives. The age range of children at primary school level in Indonesia ranges from 6-12 years. Ages are included in early childhood is very important for further development of the child. According to Piaget [11] elementary school-age children are classified into the concrete operational stage. At this stage the students are able to think systematically about the objects and events of concrete events. Based on the above opinion, is known that child's thinking ability is still limited to only concrete objects. This means that children still need help in manipulating concrete objects to think abstractly. Children will better understand a concept if it can interact directly with concrete objects, according to the stage of development of the child's age. Therefore, in mathematics, especially in elementary school required the use of props to help students understand math concepts that are abstract. In this study observations of the second cycle of activity obtained with the percentage of teachers who obtained 88.33% and the percentage of student activity obtained gained 88.89%, which is classified as either category. So for the implementation of learning already in either category and student learning outcomes have been achieved in the classical completeness, it can be stated that by using props can improve student learning outcomes on the subject of the sum of fractions mix in class V SDN 101 796 Patumbak. In various results in the show, there are some relevant studies of result use these props. In previous studies ever undertaken by [12], entitled *Improving The Mathematics Learning Achievement Using Square Fraction Props*, the conclusions of this study were 1) The use of props square fractions in learning addition and subtraction of fractions in Class VA SD Negeri Golo can improve student learning outcomes. This is evidenced by the increase in the average value of the class and

the percentage of completeness of students at every stage of research. On stage pratindakan students' average score of 50, rising to 73.12 in the first cycle, and then increased again to 80.96 in the second cycle. Meanwhile, the percentage of students learning completeness previously also increased by 40% in pratindakan, then increased to 62.5% in the first cycle, and then increased again to 80.76% in the second cycle; 2) The use of props square in learning fractions addition and subtraction of fractions in grade students of SD Negeri Golo VA can improve the quality of the learning process. Evidenced by the increase in the percentage of teachers and students' activity during the learning process. The average percentage of teachers activity by 37% in the first cycle, and increased to 74.37% in the second cycle in both categories, while the average percentage of student activity amounted to 61.24% in the first cycle, and increased to 77.41 % in the second cycle in both categories. Reference [13] Usage Viewer Tool to Improve Learning Outcomes and liveliness Students at Creative Opportunities, conclusions of this paper is that with the use of props, student learning outcomes competences apply the concept of probability theory in class X AP B semesters 2 SMK Negeri 1 Bawen in the school year 2014/2015 increased by 18.91% in the first cycle and increased 37.14% in the second cycle. Activeness get good enough category as much as 40% in the first cycle and increased in the second cycle into 51.42%. Based on the results and suggested discussion should (1) teachers develop lessons using props on the subject matter to another, so that students become easier to absorb and understand the subject matter submitted by teachers; (2) The student activity in learning more teacher attention, making them easier to understand the material; and (3) the teacher more quickly analyze any problems that arise in each cycle, so that the next cycle can appropriately be resolved. Reference [14] Improving Student Results Class Iv Using Content Viewer Tool In Summation And Reducing Fractions In Ishaka Ambon Integrated Elementary School, concluded that through the cycle I and II, of the whole discussion has been analyzed by the average value was quite good as well as data which is obtained. In particular it can be concluded that the "Materials Summation and Reducing Fractions in Class IV Madrasah Elementary Integrated (MIT) Ishaka Ambon "can improve interest and the interest of students in subjects mathematics using props such as folding paper.

#### **4. Conclusion**

Based on the research described in it can be concluded that:

1. Implementation of learning by using props in mathematics in class V SDN 101 796 Patumbak already included in good category.
2. Increased student learning outcomes following the use of props mathematics in Grades V 101 796 Patumbak Elementary School in the school year.

#### **5. Recommendations**

Based on research that has been done, researchers have some advice as follows:

1. Recommend for more students to participate in the use of props in the learning process to improve their knowledge of mathematics
2. Recommend for teachers to use props when teaching mathematics.

3. Recommend for schools to empower school facilities, instructional media and teaching aids that exist in schools to improve the quality of learning.

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