

# IMPROVING STUDENT LEARNING RESULTS IN MATHEMATICAL LESSONS OF OPERATING MATERIALS CALCULATED THROUGH LEARNING STRATEGIES *LEARNING START WITH A QUESTION*

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## ABSTRACT

The research is motivated by the low learning outcomes of the fourth grade students of SDN 042 Gambir in the mathematics subject of number counting operation material, with the aim that students' learning outcomes can increase, also to determine the activities of students and teachers as well as student responses in learning in mathematics subjects operating material count numbers. This study uses the learning strategy Start with a question, which is a learning strategy that makes students learn actively by making them ask about the subject matter before an explanation from the teacher. This study uses Classroom Action Research (CAR) method known as Classroom Action Research (CAR) which aims to improve the quality of the learning process in the classroom. The technique of collecting data through observation, questionnaires, tests and documentation. The respondents were 33 fourth grade students of SDN 042 Gambir. The results of this study were: student learning outcomes in learning operations count numbers before action is still low, this is known from the students' reaching KKM 65 only 39.4% of all students. After the implementation of learning strategies. Student learning outcomes increased to 66.7% in cycle I and to 87.9% in cycle II, teacher and student activities increased and students' responses to learning were quite positive.

**Keywords: Learning Outcomes, Down Counting Operations, Learning Start with a Question.**

## INTRODUCTION

School is a place to obtain, improve and maintain individual abilities. Thus the achievement of these objectives will formally depend on the institutional success of an educational institution. Because education must serve human growth in all its aspects, both spiritual, intellectual, imagination, physical, scientific, and language aspects.

The implementation of a successful learning process must involve several interrelated factors, namely the curriculum, methods, strategies, infrastructure, students,

teachers, subject matter, and the learning process itself. The learning process is a form of activity, where the teacher and students together create a good situation, resulting in two-way communication between the teacher and students and also between students. Learning must be directed at changing students, both changes in cognitive aspects (knowledge), affective (attitude) and psychomotor (action) (Slameto, 2003: 76). Whether or not the achievement of educational goals is successful depends on the learning process experienced by students, both when they are in school, in the family environment or in the community.

Teachers in the teaching and learning process have a multi-role function namely as instructors, educators, trainers and also have a great responsibility to achieve educational progress as well as to improve the quality of the nation's human resources. It must be admitted that the progress of education depends largely on the authority and ability of the teacher. Teachers as one of the main components in schools, play a very strategic role in the achievement of the objectives of the programs set by the school and national education goals. As professionals, teachers are required not only to have competencies that are appropriate to their fields of expertise, but teachers are also required to be able to explore all their abilities and competencies and be able to transform, develop and disseminate science and technology through education, research and community service. .

One of the initial keys for students to be able to achieve satisfactory learning outcomes is to understand the subject matter. Therefore, the initial step in each learning process is to condition students so that they are able to understand the concept of a subject matter. Because if the concept of the subject matter has not been mastered by students, students will not understand the problem and then students will have difficulty in solving the problems faced by the students.

Marpaung (2003) teaching paradigm in Indonesia has characteristics including: active teachers while passive students, teacher-centered learning, teachers transfer knowledge to students, student achievement tends to be mechanistic, students remain (physically) and full of concentration (mental) pay attention to what is taught by the teacher. This condition gives rise to the assumption for students that learning mathematics is nothing more than just remembering and then forgetting facts and

concepts. This can lead to low achievement of students' reasoning learning. Therefore, a proper learning strategy is needed, especially for mathematics subjects.

Until now, there are still many obstacles faced in the effort realize learning goals. One of the constraints is the form of mathematics learning used by teachers today that still uses more conventional learning methods, learning is still teacher-centered without involving students, so it does not attract students' interest in learning which ultimately causes students to feel bored. This will certainly affect the learning achievement achieved by students. Students who feel bored of learning will not be able to absorb the subject matter properly so that the test results of students will often show low results.

In addition to learning that is still often delivered conventionally, there are still many mathematics teachers who compose learning programs not oriented to the reality and problems that are often faced by students in their lives. A large number of mathematics learning material has not been so well embedded in student learning achievement. Many students cannot feel the emotional connection with the subject matter so that students cannot feel that the material of mathematics learning is important for their lives.

One of the material in mathematics subjects that has not been understood by Grade IV Elementary School students is the number counting operation material. This material becomes difficult because the process of introducing students to it is often only informative. Students are often only asked to memorize understanding, given examples and must hold practice questions based on examples. To answer all the problems that arise in learning mathematics, especially those related to understanding, innovative efforts must be developed immediately, one of which is by applying the right strategies, methods, and approaches to students' conditions or material.

One form of learning strategies that teachers can apply in learning mathematics to improve student learning outcomes is active learning so that teaching and learning is not only teacher-centered, but students can also explore their potential to understand a subject matter. Similar research that has succeeded in improving student learning outcomes using Learning learning strategies Start with a Question. This is in accordance with research conducted by Fabiardhi (2014), there is an increase in student learning outcomes using Learning learning strategies Start with a Question. The results of

research conducted by Fabiardhi (2014) show that mathematics learning using Learning learning strategies Start with a Question can improve student learning outcomes. This is indicated by an increase in student learning outcomes in mathematics subjects in flat wake material. This can be seen from the results of the implementation of learning which shows an increase in student learning outcomes. The results of the implementation of the learning process before the action amounted to 25% of students who completed learning and after doing the action increased by 50% in cycle I (increased by 25%), and at the end of the action students who completed learning increased to 81.25% in cycle II (increased 31.25%). The conclusion of this study is that the application of the Learning learning strategy Start with a Question can improve students' mathematics learning outcomes.

Learning Start with a Question is a method that invites students to be able to ask questions and find answers to the questions they ask by discussing their fellow groups so that they better understand the material taught by the teacher. Learning Start with a Question has several advantages, including learning that uses Learning Start with a Question can foster a conducive atmosphere where students actively ask questions, question and express ideas so that learning becomes more active. Before students ask questions, students must first read and understand the material provided by the teacher so that students can ask questions that students want to submit from material that is not yet understood. Active learning strategy with the method of starting the lesson with questions (Learning Star with a Question) is expected to optimize the process of learning mathematics in the classroom because with this strategy students are required to understand the material that will be provided by the teacher by discussing it with the group, in addition students are also asked to make questions from material that they have not understood in such a way that students are expected to improve their mathematics learning outcomes.

In this study not only see how to improve student learning outcomes but also see how the activities of teachers and students as well as students' responses to mathematics subjects in the number counting operations material using Learning Learning strategies Start with a Question. Based on the problems stated above, the researcher raised interest in researching with the title "Increasing Student Learning Outcomes in Mathematics Subjects to Operations Count Numbers through Learning Strategies Learning Start with a Question".

## LITERATURE REVIEW

### Learning Outcomes

Dimiyati and Mudjiono (2013: 3) explain that learning outcomes are the result of an interaction of learning actions and teaching actions. From the teacher's perspective, teaching action ends with a process of evaluating learning outcomes. In terms of students, learning outcomes are the culmination of the learning process. As for Sudjana (2014: 24) suggests learning outcomes are abilities that students have after they receive their learning experience.

Factors that determine the achievement of learning outcomes according to Dalyono (2007: 55) that comes from within those who learn and from outside themselves, the first internal factors, namely a) Health, b) Intelligence and Talent, c) Interest and Motivation; and d) Learning Method, while the second is External Factors, namely a) Family; b) School, c) Community; and d) Surrounding environment.

### Mathematics

Mathematics is a subject that requires someone to think rationally by calculating everything. Mathematics is a general subject and must be studied not only in our country of Indonesia, but throughout the world.

Mathematics is a universal science that underlies the development of modern technology, has an important role in various disciplines and advances the power of human thought. The rapid development in the field of information and communication technology today is based on mathematical developments in the fields of number theory, algebra, discrete analysis, opportunity theory and mathematics. To master and create technology in the future, strong mastery of mathematics is needed from an early age.

Mathematics subjects need to be given to all students starting from elementary school to equip students with learning achievement to think logically, analytically, systematically, critically, and creatively, as well as learning achievement in collaboration. The competency is needed so that students can have the learning achievement of acquiring, managing, and utilizing information to survive in an ever-changing, uncertain, and competitive situation.

The problem solving approach related to data is a focus in learning mathematics which includes closed problems with a single solution, open problems with a single solution, and problems with various ways of solving. To improve the achievement of

problem-solving learning needs to be developed skills to understand problems, make mathematical models, solve problems, and interpret solutions.

Mathematical learning should begin with the introduction of problems that are appropriate to the situation (contextual problem). By proposing contextual problems, students are gradually guided to master mathematical concepts. To improve the effectiveness of learning, schools are expected to use information and communication technologies such as computers, teaching aids, or other media.

### Number Count Operations

Number counting operation is one of the compulsory subjects in mathematics for elementary students because it is useful for solving problems related to everyday life. Number counting operations are a way to complete calculations, both addition, subtraction, multiplication and division.

The types of number counting operations are as follows:

#### a. Operations for Calculating Addition and Subtraction of Round Numbers

For addition and subtraction that must be known as follows:

- 1) If both signs are the same, then the sum result is also the same
- 2) If the second sign is different, then the sum result follows a sign that has a large number.

Example:

$$24 + 38 = 62 \text{ (the sign is positive)}$$

$$-22 + -32 = -55 \text{ (the sign is both negative)}$$

$$46 - (-32) = 78 \text{ (the sign is different, the sign of the result is the same as the one that has a bigger number)}$$

$$-86 + 40 = -46 \text{ (the sign is different, the sign of the result is the same as the mark that belongs to a bigger number)}$$

#### b. Operation Calculate Multiplication and Distribution of Round Numbers

##### Multiplication

Multiplication operations are usually symbolized by a cross ( $\times$ ) or period ( $\cdot$ ). The concept of multiplication actually comes from repeated summation operations.

Properties of Round Number Multiplication Operations

As you have learned, if  $a$  is a positive integer it means  $a > 0$  while if  $a$  is a negative

integer it means a  $< 0$ . After remembering the material, check the properties of the multiplication operations in the following integers!

### Division

Inversion (opposite or opposite) of multiplication operations is a division operation. The division operation is usually symbolized by a colon ( $\div$  or  $:$ ) or a line mark ( $/$ ). As with multiplication, the concept of division is a repeated reduction until it runs out.

#### Properties of Operation for Distribution of Round Numbers

The main condition of division, that is,  $b$  cannot be equal to zero ( $b \neq 0$ ). If  $b = 0$  it is called undefined. Next, check the properties of the division operation in another integer!

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### c. Mixed Count Operations on Round Numbers

To work on mixed counting operations that must be considered as follows:

- 1) Work first on the calculation operation in parentheses.
- 2) If in the case of multiplication and division operations, do the calculation operations in the front or left
- 3) Selesaikan operasi perkalian dan pembagian sebelum operasi penjumlahan dan pengurangan. Complete multiplication and division operations before addition and subtraction operations.

Example:

1.  $(-32 \times 2) + 30 - (15 : 3) = (-64) + 30 - (5) = (-34) - 5 = -39$
2.  $5 \times (40-30) : (25 + 25) \times 2 = 5 \times (10) : (50) \times 2 = 50 : 100 = 0.5$
3.  $(-75) ; 5 + (-20) \times 3 = (-15) + (-60) = -75$

### d. Properties of Operations Calculate numbers

The general form of the properties of the calculated operation are as follows:

- 1) Nature of Exchange (Commutative)

Commutative properties apply to addition and multiplication. The general form of commutative properties in addition is as follows:

$$a + b = b + a$$

The general form of commutative properties in multiplication is as follows:

$$a \times b = b \times a$$

## 2) Clustering (Associative)

Associative properties apply to addition and multiplication. The general form of associative properties in addition is as follows:

$$(a + b) + c = a + (b + c)$$

The general form of associative properties in multiplication is as follows:

$$(a \times b) \times c = a \times (b \times c)$$

## 3) Distributive Properties

Distributive properties apply to the multiplication of the sum and multiplication of the reduction. General form of distributive properties of multiplication of addition:

$$a \times (b + c) = (a \times b) + (a \times c)$$

General form of distributive properties in multiplication:

$$a \times (b - c) = (a \times b) - (a \times c)$$

## Learning Start With A Question

Dick and Carey (Zulrahmattoqala.2015), states that the learning strategy is a set of materials and learning procedures that are used together to create learning outcomes for students. Different strategies with methods. Strategy refers to a plan to achieve something, while a method is a method that can be used to implement a strategy. In other words, the strategy is a plan of operation achieving something; while the method is a way in achieving something.

The learning strategy is basically a series that is important in the teaching and learning system approach, because the learning strategy is directly related to the selection of learning activities that are considered effective and efficient in providing students' learning experiences to achieve learning goals. Research shows that learning something new will be more effective if the student is active and keeps asking questions rather than just accepting what the teacher has to say. One way to make students learn actively is to make them ask questions about subject matter before there is an explanation from the teacher. This strategy can inspire students to achieve the key to learning, namely asking. The method in this learning strategy is called the Learning Starts with a Question strategy(the lesson starts with the question).

A teacher can make his own reading material or choose one particular topic or chapter from a textbook that gives an opportunity to be interpreted differently, then shared with students. The teacher will ask students to study and write questions about the material students have read. The lesson can be delivered by answering these questions.

The steps of the Active Learning Learning Starts with a Question strategy are as follows:

1. Choose the appropriate reading material then share it with students. In this case the reading does not have to be photocopied then it is shared with students, but can be done by selecting a particular topic or chapter from the textbook.
2. Ask students to study reading alone or with friends.
3. Ask students to mark the part of the reading that is not understood.
4. In pairs or small groups, ask students to write questions about the material they have read.
5. Collect questions that have been written by students.
6. Convey the lesson by answering these questions.

Learning strategies Starts with a Question have advantages and disadvantages. The advantages of Learning Start With A Question learning strategies are as follows:

1. Students become ready to begin the lesson, because students learn first so they have a little picture and become more understanding after getting additional explanations from the teacher.
2. Students become active asking questions.
3. Material can be remembered longer.
4. Students' intelligence is honed when students learn to ask questions.
5. Encourage the growth of courage to express opinions openly and broaden horizons through exchanging opinions in groups.
6. Students learn to solve their own problems in groups and work together between smart students and less intelligent students.
7. Can find out which students are learning and who are not learning.

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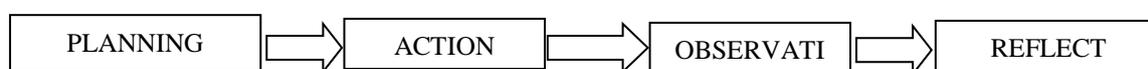
The shortcomings of the Learning Start With A Question learning strategy are as follows:

1. It takes a long time if many questions are asked by students.
2. If the teacher provides opportunities for other students to answer, questions or answers can be digressed if the student does not learn or does not master the material.
3. Apathetic for students who are not accustomed to speaking in forums or passive students.
4. Require students to have sufficient background on the topic or problem being discussed.

## RESEARCH METHODS

Classroom Action Research (CAR) in this study uses a spiral flow model. This model is a development of the basic concepts introduced by Kurt Lewin, the first person to introduce action research.

In implementing CAR as far as possible the class room exceeding perspective should be used, in the sense that the problem is not seen as limited in the context of a particular class or subject, but rather the perspective of the overall school mission. CAR is carried out through a process of recycled recycling consisting of 4 stages as shown below:



**Figure 1.** Four Phase PTK Processes Top of Form

According to Kemmis and Mc Taggart (Kasihani: 1998) classroom action research is carried out through a dynamic and complementary process, which consists of four essential momentum, namely: planning, action, observation and reflection. These four main aspects are a cycle process in which participants in the action research group take action:

1. Develop an action plan which critically aims to improve what has happened;
2. Acting to implement the plan;
3. Observing the effects of these actions in the context of their research;
4. Reflect on this effect as a basis for advanced planning, follow-up actions, and so on through a series of stages.

According to Mulyasa (2017: 10), "In simple terms Classroom Action Research (PTK) can be interpreted as action research conducted in order to improve the quality of the learning process and results of a group of students".

## RESULTS AND DISCUSSION

### Results

The material in the mathematics subjects taught in this study is about number counting operations. Before the research was carried out the author first gave a pre-test in the form of a matter of description about the nature of the number count operation to students to find out their initial knowledge about the properties of number counting operations. In the pre-test activity, students worked on the questions given by the teacher in ten questions. The questions given varied, namely questions about the nature of commutative, associative, and distributive to do number counting operations.

In the pre-test activity, the learning of number counting operational material achieved by students was 39.4% (13 students) out of 33 students and 60.6% (20 students) had not been completed according to KKM (65), with average grades low average is 56.4. Based on the results of the Pre Test can be seen, the average value of students is quite low at 56.4. This indicates that students still do not understand the number counting operations material, so researchers feel the need to conduct learning actions in order to help improve students' understanding so that student learning outcomes in learning numerical operations can increase.

Here are some stages of CAR in this study: the first cycle consists of two meetings, with four stages, namely planning, implementing, observing, and reflecting. In the planning phase in the first cycle conducted by researchers is preparing learning scenarios in the form of lesson plans, observation sheets for teachers and students, evaluations, student worksheets, and learning media. From the results of the implementation of the learning cycle I, the material discussed about the commutative nature of performing number counting operations, and the implementation of the second meeting of the material to be discussed is the associative nature of performing number counting operations.

The value of student evaluation in cycle I (meeting 1, 2) after averaging the results obtained that 66.7% (22 students) had achieved a score of 65 (KKM) while students who received less scores from KKM were 33.3% (11 students), with an average passing grade of 70.1. Thus means that the Learning Learning Start with a Question strategy has not been maximally able to improve student learning outcomes in the learning of number counting operations. When viewed from the value of student evaluation, there is an increase but has not reached the criteria, because the increase in learning outcomes is achieved if students who complete the learning reach 85%.

From the results of observations made by observers at the 1st meeting regarding teacher activity, obtaining an average score of 3.7. The activities carried out by the teacher in the implementation of learning have not reached the average benchmark Teacher activity in the implementation of learning has not yet reached the average benchmark  $\geq 4$ . The overall results of observations on teacher activities in cycle I obtain an average of 3.9. This means that in the first cycle the activities carried out by the teacher have not met the benchmark value, namely  $\geq 4$ .

While the results of observations regarding student activities at the first meeting received an average of 3.3. This means that it has not reached the benchmark number, namely  $\geq 4$ . Then at the second meeting the results of observations on student activities obtain an average of 3.7. This also means that it has not reached the benchmark number, which is rata 4. The average observation result of the activities carried out by students in cycle I is 3.5. This means that the activities carried out by students in the first cycle have not reached the target of  $\geq 4$ .

According to the results of the reflection of researchers, researchers need to improve and strengthen the implementation of learning into cycle II so that the improvement of students' understanding can be achieved optimally, and the activities of teachers and students can improve. The second cycle consists of two actions, each action consists of four stages, namely planning, implementing, observing, and reflecting. In the planning phase of the second cycle conducted by researchers is preparing learning scenarios in the form of lesson plans, observation sheets for teachers and students, evaluations, student worksheets, and learning media. The implementation of the first and second meetings in the second cycle, the material studied is the distributive nature to perform number counting operations. The activities carried out at the second meeting in the second cycle were working on the post-test, and filling out a questionnaire that aimed to determine the students' response to the learning of number counting operations that had been carried out through learning strategies Learning Start With A Question. The first meeting of cycle II, students who have evaluation value  $\geq 65$  (KKM) as many as 29 students (87.9%), while those who have not met the KKM are 4 students (12.1%), with an average grade 81 grade completeness, 8.

The results of observations made by observers regarding the activities of teachers in cycle II were only conducted at one meeting and obtained a final score of 4.1. Therefore, the activities carried out by the teacher in the implementation of learning have reached the average benchmark  $\geq 4$ . While the results of observations regarding student activities in the second cycle were only carried out at the first meeting only to obtain an average of 4.2. This means that it has reached the benchmark target number of  $\geq 4$ .

Based on the results obtained in filling out the questionnaire by students, showed that the students' responses to mathematics learning through the Learning Learning strategy Start with a Question showed a positive attitude. To find out how much students interest in learning, after conducting research in the implementation of learning by using the Learning Learning strategy Start with a Question, the researcher gives a questionnaire which is then filled by all students.

Questionnaires distributed to students during the process of learning mathematics through Learning learning strategies Start with a Question on mathematics subjects number counting operations can be seen in the table below:

**Tabel 1.** Student Response Questionnaire

No.	Statement	Student Response	
		Yes	No
1	This way of learning encourages me to become more active	29	4
2	By learning like this, it makes me appreciate the opinions of others	31	2
3	I find it easier to understand the number counting operating material in learning through learning strategies <i>Learning Start With A Question</i> .	30	3
4	I want other topics to be taught like this.	31	2
5	I prefer group learning rather than self-study	33	0
6	I am happy when told to present the answers to the questions in front of the class	28	5
7	This way of learning, makes me enjoy learning mathematics. I prefer group learning rather than self-study	31	2
8	This way of learning, makes me dare to ask the teacher questions.	30	3
9	How to learn like this, I increasingly understand the number counting operations material.	33	0
10	How to learn like this, my value is increasing.	33	0
Amount		309	21

From this table can be calculated the percentage of the overall student response questionnaire that is multiplying the item in the questionnaire as many as 10 with the total student respondents that is 33, then the results obtained 330. After obtaining these results, then counted the number of student respondents who answered "Yes" that is as much 309.

For more details, this calculation can be calculated using the percentage formula of the answers that have been described in the previous discussion as follows:

$$\text{Percentage of answers} = \frac{309}{330} \times 100\% = 93,6\%$$

Based on these statements, it can be concluded that the students' response to the Learning learning strategy Start with a Question on the mathematics subject of operating numbers count almost all respond positively.

## Discussion

Based on the observation and analysis of the evaluation results in cycle II there were 29 students who were complete and 4 students who had not yet finished learning. From the results of the implementation of learning, it is known that as long as the teacher carries out the learning process in cycle II students are already active in learning activities. There has been an increase in student learning completeness from the initial conditions (the results of the pre test) with an average value of 56.4 to 70.1 (the average value of the first cycle evaluation), then to 81.8 (the average value of cycle II). When viewed based on learning completeness criteria that  $\geq 85\%$  are understood, in cycle II shows that students can already be understood because students who have reached KKM ( $\geq 65$ ) are 87.9%.

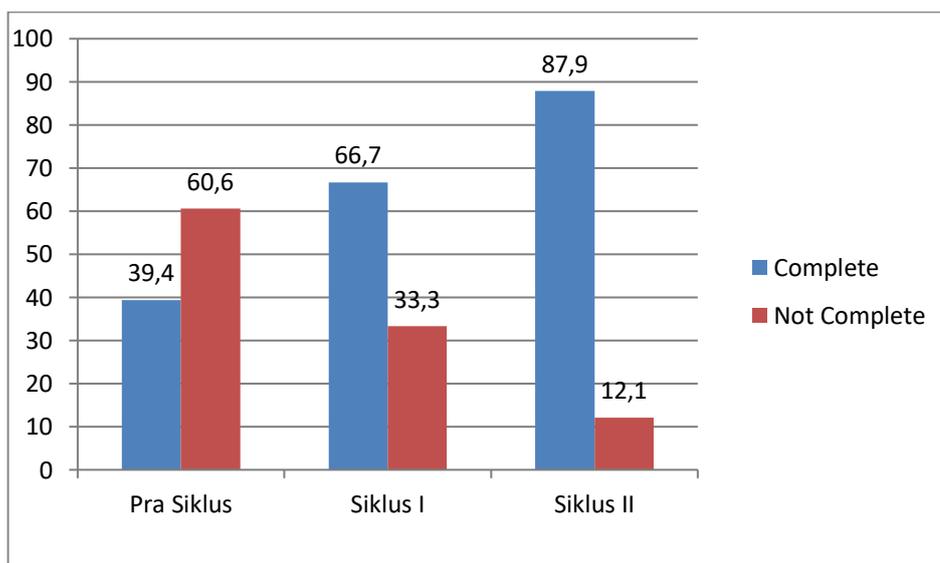
The results of observations on the activities of teachers in the second cycle obtain an average score of 4.17 while the results of observations on student activities obtain an average score of 4.07. So that the activities carried out by the teacher and students in the second cycle have reached the target of a score of  $\geq 4$ . Comparison of Students' Pre-Cycle, Student Cycle Completeness, Cycle II, can be presented in the table below:

**Tabel 2.** Comparison of student learning completeness

Aspect of observation	Cycle					
	Pre Cycle		Cycle I		Cycle II	
	Number of Student	Percentage	Number of Student	Percentage	Number of Student	Percentage
Completeness in learning	13	39,4 %	22	66,7 %	29	87,9%

The results of observations or observations presented in the table above can be described that the achievement of student learning outcomes increases. From the initial conditions at the pretest, only 13 students were completed or about 39.4% of all students, to be 22 students or 66.7 from all students completed above KKM 65 on silk I, and the final result was 29 students or 87.9% of all students complete the KKM 65.

A real picture of improving student learning outcomes in the first cycle and second cycle is presented in the following graph:



**Figure 2.** Student Learning Improvement Results

From Figure 2, shows student learning outcomes each cycle has increased. The number of students who did not complete also decreased each cycle. The results of classroom action research conducted as much as two cycles have increased from cycle I to cycle II, and have been able to reach the completion limit in accordance with the performance indicators that have been set on the material. Thus, the classroom action research carried out has been in accordance with the expected objectives, namely through the Learning Learning strategy Start with a Question can improve student learning outcomes in mathematics subjects count number operations.

## CONCLUSIONS AND SUGGESTIONS

### Conclusions

Based on the results of the study, it can be concluded:

1. The use of Learning learning strategies Start with a Question can improve student learning outcomes in mathematics subjects count counting operations.
2. The activity of teachers and students in the learning of mathematics the material of number counting operations through learning strategies Learning Start With A Question shows a fairly good improvement.
3. The response of students in learning mathematics material count operations through learning strategies Learning Start With A Question shows a positive response.

### Suggestions

Based on the results of the research that has been carried out, the researcher gives some suggestions as follows:

1. The teacher must be able to design creative material and always foster student activity and creativity so that students are active in the learning process, through group discussions so that students can cooperate, help each other, and communicate.
2. Based on research, mathematics learning with the Learning learning strategy Start with a Question, deserves to be considered as one of the learning strategies in order to improve students' mathematics learning outcomes. Because of this learning strategy, students tend to be more actively involved in the learning process, so that they can learn more optimally.
3. In applying mathematics learning with the Learning Start with a Question strategy, it is necessary to pay attention to which material is appropriate to be conveyed through the Learning Strategy Start with a Question, because not all materials are suitable to be conveyed with this learning strategy.

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