Proving Learning Outcomes in Mathematic of Long Addition and Subtraction Materials through the Cooperative Learning Type Jigsaw Model Class IB Islamic Elementary School An-Nuriyah

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Abstract

Based on the learning results of first grade students of SDS Ialam An-Nuriyah Jagakarsa South Jakarta, it shows that the results of learning Mathematics about addition and subtraction in long series are still below the specified KKM which is 70. Of the 25 students, only 8 students were able to reach the KKM, while 17 students were declared not to have reached the KKM score. In line with this, an improvement in learning Mathematics about addition and subtraction using the cooperative learning type jigsaw model was carried out. The purpose of this study was to improve the learning outcomes of IB grade students on long addition and subtraction. This research uses a class action research method that uses a cycle system consisting of planning, implementation, observation and reflection. Based on the results of the study, in the pre-cycle students whose learning completeness was above KKM 70 were only 8 students or (36.0%) out of 25 students. In cycle 1 it increased to 14 students or (56.0%) out of 25 students. While in cycle 2 it increased to 24 students or (96.0%) of 25 students. This means that the class learning completeness has been achieved because it has exceeded the target of the predetermined success indicator of 80%. The conclusion is that using the jigsaw type cooperative learning model on long addition and subtraction material can improve student learning outcomes.

Keywords: Learning Mathematics, long subtraction, Learning Outcomes, Cooperative learning model, jigsaw, learning improvement, elementary mathematics

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Introduction

Mathematics is a language of symbolic practical functions to express quantitative and spatial relationships while the theoretical function is to facilitate thinking (Abdurrahman, 2002). Mathematics is undefined elements, definitions, axioms, and postulates where the argument after proving valid in general, because mathematics is often called deductive science. Learning mathematics in elementary school (SD) needs to receive serious attention from various parties, namely educators, government, parents, and society, because learning mathematics in elementary school is the laying of basic concepts that are used as a foundation for learning at the next level. In addition, strong mastery of mathematics from an early age is necessary for the mastery and creation of technology in the future (Johnson & Russefendi, 1972).

In general, students think that math is a difficult subject to understand so that not a few students are afraid of math subjects. By changing the learning system from teacher centered to student centered, expository methodology to participatory and textual approach to contextual. All these changes are intended to improve the quality of education, both in terms of process and education (Johnson & Russefendi, 1972).

The abilities that can be obtained from mathematics include: a) the ability to count, b) the ability to observe and imagine geometric buildings that exist in nature along with their respective spatial properties, c) perform various kinds of measurement skills, such as length, area, volume, weight and time, d) the ability to observe, organize, describe, present and analyze data, e) the ability to quantify various variables in various fields of life, f) the ability to observe patterns or structures of a situation, g) the ability to distinguish between relevant and irrelevant things in a problem, h) the ability to make predictions or estimates about something based on existing data, i) the ability to reason logically, including the ability to detect contradictions in reasoning or actions, j) the ability to think and act consistently, k) the ability to think and act independently (independently) based on an accountable basis, l) the ability to think creatively, and be able to solve problems in various situations. In addition to providing abilities, the field of mathematics is also useful for instilling or strengthening certain attitudes. Attitudes that can be developed through the study of mathematics include a meticulous attitude, a critical attitude, an efficient attitude, a painstaking attitude, a consistent attitude and a universal truth.(Souviney, 1994).

To improve math scores we must know how students learn during class. Learning outcomes include cognitive, affective and psychomotor abilities, namely the Cognitive Domain includes knowledge, memory, understanding, explaining, summarizing, examples, applying, describing, determining relationships, organizing, planning, forming new buildings and assessing. Affective domain attitudes of acceptance, response, value, organization, characterization. The psychomotor domain includes productive, physical technical, social managerial, and intellectual skills (Bloom & Suprijono, 2009).

This research is different from previous research because this research contains novelty in the aspect of place, namely An-Nuriyah Jagakarsa Islamic Elementary School, South Jakarta and the learning model, namely cooperative learning type jigsaw written by Maisyaroh.

Based on the theories above, the action hypothesis of the class research is that the jigsaw type cooperative learning model can improve the learning outcomes of IB class students on the material of long stacked addition and subtraction at SDS Islam An-Nuriyah Jagakarsa South Jakarta.

Theoretically, this research is expected to develop a jigsaw type cooperative learning model applied in the process of learning mathematics addition and subtraction material. this study aims to improve the learning outcomes of mathematics addition and subtraction material through the jigsaw type cooperative learning model in the IB class of An-Nuriyah Cipedak Jagakarsa Islamic Elementary School, South Jakarta in the 2017-2018 school year.

Literature Review

Research from Mills in the UT FKIP Team (2013: 8) states that "Classroom Action Research (PTK) is a systematic research process carried out by teachers or other people in a learning environment to obtain information about how teachers teach and students learn and take action to improve it".

Research from the Ministry of National Education (2006) has stated that the learning objectives of mathematics subjects at school are for students to have the ability: a) use reasoning on patterns and properties, perform mathematical manipulations in making generalizations, compiling evidence, or explaining mathematical ideas and statements, b) solve problems that include the ability to understand problems, design mathematical models, solve models and interpret the solutions obtained, c) communicate ideas with symbols, tables, diagrams, or other media to clarify situations or problems, d) have an attitude of appreciating the use of mathematics in life, namely having curiosity, attention, and interest in learning mathematics, as well as a tenacious and confident attitude in problem solving.

Research from Slavin (Isjon, 2011: 15) states that "in cooperative learning methods, students work together in four member teams to master material initially presented by the teacher". This means that cooperative learning is a learning model where the system learns and works in small groups of 4-6 people collaboratively so that it can stimulate students to be more passionate about learning.

Research Method

This research was conducted in the 1B class of SDS Islam An- Nuriyah Jakagarsa south Jakarta in the second semester of the 2017/ 2018 academic year . This research was conducted for 3 months starting from February 2018 to April 2018. The subject of thiss class action research was conducted on 1B class student of SDS Islam An- Nuriyah Jakagarsa South Jakarta. The number of student is 25 people , consisting of 12 boys and 13 girls.This research is a classroom action research (PTK) that uses a cycle system from the model of Kemmis and

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Mc. Toggart model which consist of : Planning , Action , reflecation observation. Data analysis technique using observation, field notes and tests.

Result/Findings

This class action research was conducted in IB class of SDS Islam An-Nuriyah Cipedak Jagakarsa South Jakarta. This class action research was conducted in 2 cycles to determine how to improve student learning achievement results through the jigsaw type cooperative learning model in learning mathematics for IB class students of SDS Islam An-Nuriyah Cipedak Jagakarsa South Jakarta.

Based on the research carried out starting from the examination of the pre-cycle stage to the second cycle, the following data were obtained:

1. **Description of Pre-Cycle Research Results**

    Pre-cycle learning of Mathematics subject IB class of An-Nuriyah Islamic Elementary School Cipedak Jagakarsa South Jakarta, 2017/2018 academic year with the material of addition and subtraction in long series which was held on Monday, February 26, 2018 as follows:

    a. Planning
    - Teachers together with colleagues determine the design of learning implementation.
    - Develop a lesson plan

    b. Implementation

    The implementation of learning activities in the pre-cycle in mathematics lessons on simple fraction material was carried out on Monday, February 26, 2018 of the 2018/2019 school year. The learning steps carried out in the pre-cycle include initial core and closing activities.

    c. Observation
    - Teachers observe every learning process in class.
    - It is expected that based on observations the teacher gets information about the suitability between learning and implementation.
    - Evaluating students' abilities in the form of independent assignments.

    Based on the data from the students' scores above in the pre-cycle, data analysis was obtained, namely 8 students (36.0%) were declared successful / achieved obtaining scores above the KKM while 17 students (64.0%) were declared unsuccessful / achieved obtaining KKM scores. To find out the presentation of grades, an analysis was held which is presented in the table and Diagram 4.1 below:
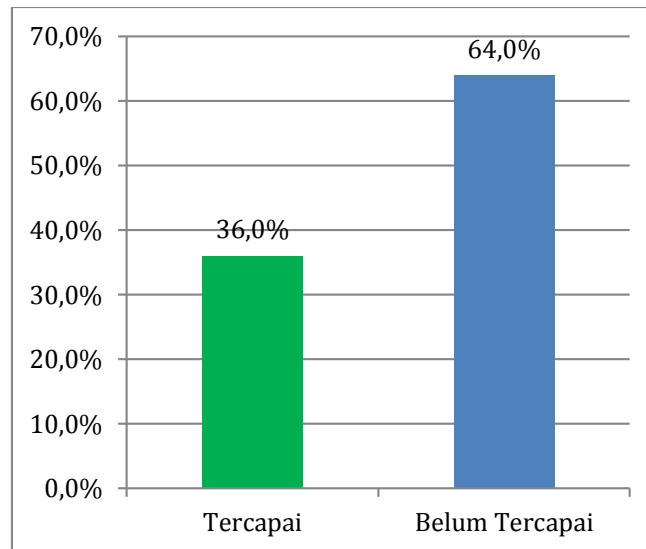
Diagram 4. 1 Diagram of Pre-Cycle Math Score Achievement

To further improve the achievement of student learning outcomes in learning Mathematics subjects, it is necessary to make improvements in cycle 1.

a. Reflection

In the Pre-Cycle, students who scored below the KKM were more because the teacher had not explained the material about long addition and subtraction, so the students did not understand the material and the method used by the teacher was only the lecture method. There was even 1 student whose score was 20, for reasons other than not being explained by the teacher, the student also had learning difficulties and lack of concentration in learning, when the teacher explained the student paid more attention to other friends so that he did not know the information conveyed by the teacher, the student also liked to chat with his friends.

At the reflection stage, the researcher collaborates with colleagues and consults with the supervisor to record all findings in improving learning, which includes:

➢ Reviewing implementation and learning.
➢ Evaluate in general the learning process and results.
➢ Make a list of problems that arise.
➢ Planning follow-up planning for cycle 1.

1. **Description of Cycle I Research Results**
   a. Planning
      ➢ Teachers together with peers determine the design of learning implementation.
      ➢ Develop a learning implementation improvement plan.
   b. Implementation

   The implementation of learning activities in Cycle I in mathematics lessons on long-standing addition and subtraction material was carried out on Wednesday, March 14, 2018 of the 2018/2019 school year.

   The learning steps carried out in Cycle I include initial, core, and closing activities.

c. Observation

In observation activities supervisor 2 provides a lot of input - input on the shortcomings of researchers in providing learning materials in the classroom. Supervisor 2 makes observations and records things that are encountered when learning takes place through instruments that have been provided on the observation sheet of teacher performance.

Table 4.2 Percentage of Completion of Learning Outcomes and Observation Results Cycle 1

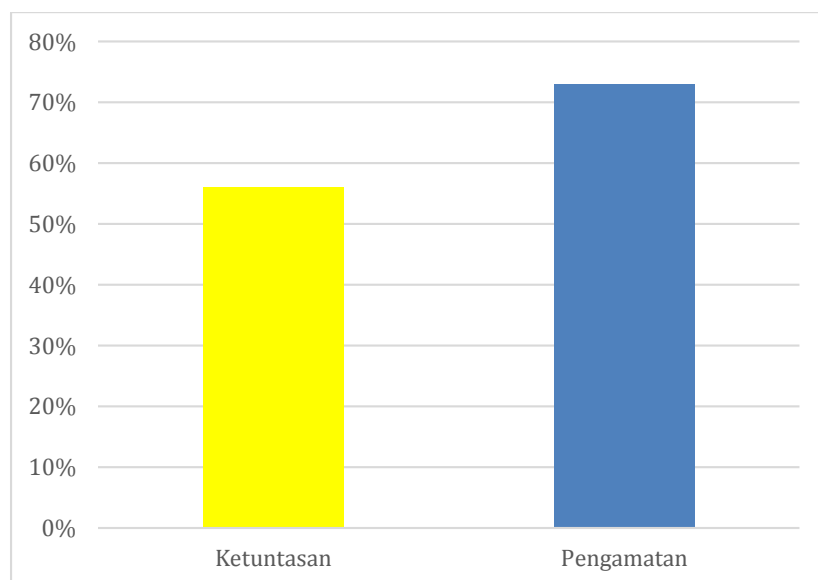| No	Achievement	Percentage
1.	Achieved	56.0 %
2.	Not Achieved	44,0 %
		100.00 %

Diagram 4.2 Math Score Attainment Diagram

Cycle 1 Improvement

Based on the table above, the percentage of students who reached the KKM score is 56.0% or 14 students. While the remaining 44.0% or as many as 11 students still get scores below the KKM which is 70. The following is a picture of student achievement in the form of a diagram.

a. Reflection.

In the reflection, several weaknesses were found by the teacher in cycle I learning, one of which was that the teacher still lacked motivation for students and there were still students who were less focused in the learning process and the unavailability of learning tools or media. However, in this cycle I learning there has been an improvement compared to pre-cycle learning.

Reflections on cycle 1 so that teachers can prepare interesting tools or media so that students can focus and understand more in learning math material for long addition and subtraction.

1. **Description of Cycle II Research Results**
   a. Planning
      - Teachers together with peers determine the design of learning implementation
      - Develop a learning implementation improvement plan
      - Developing learning media
      - Prepare assessment instruments (student worksheets)
   b. Implementation

      The implementation of learning activities in Cycle II in mathematics lessons on the material of addition and subtraction in long series was held on Monday, March 26, 2018. The learning steps implemented in Cycle II include initial, core, and closing activities.
   c. Reflection

      Reflection in cycle 2 is carried out to improve the learning model by using the jigsaw type cooperative learning approach and media in the form of number cards which are expected to improve the learning outcomes of students in the learning process in Mathematics subjects, especially on the subject matter of long stacked addition and subtraction.

      Cycle II learning improvement was carried out on Monday, March 26, 2018 with the object of IB class students of semester II SDS Islam Annuriyah Cipedak Jagakarsa. The learning process went well. When explaining the material, the researcher uses media in the form of number cards to make it easier for students to understand the material of long stacked addition and subtraction, and make students interested and focused in learning. The results of learning improvement cycle II are presented in table 4.4 as follows.

      From the table above we can see 24 students who scored above the KKM out of 25 students. Only 1 student scored below the KKM. The reason is that this student has learning difficulties or is categorized as a student with learning difficulties and after an intensive approach, the researcher can conclude that the classification of learning difficulties is genetic. To find out the presentation of grades, the analysis is presented in the table and diagram 4.3 below:
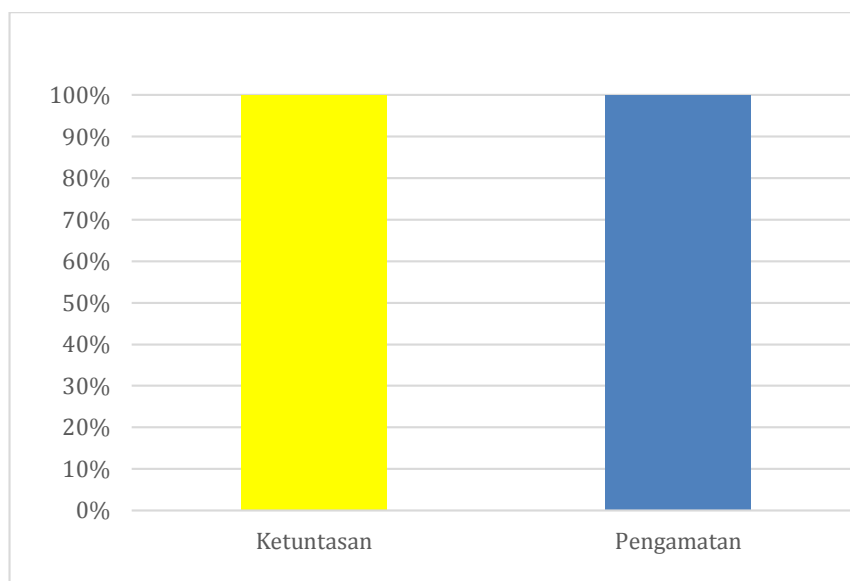
Based on the data from the acquisition of student scores in the learning improvement activities of cycle II, the results of 24 students (96%) were declared successful and achieved in achieving KKM.

Discussion

A. Discussion of Learning Improvement Research Results

The acquisition of learning outcomes starting from pre-cycle, improvement of cycle 1 and cycle 2 has improved well, although in the first cycle improvement students who reached the new KKM score (56.00%) and in cycle 2 (96.00%) have not reached 100%.

By receiving input from supervisor 2 about the shortcomings made in the first cycle, then in the second cycle students were given a detailed explanation of things related to addition and subtraction with long stacking and students were given an explanation through the jigsaw type learning model and also given interesting media in the form of number cards. So that students can work on problems more happily and more thoroughly.

From the pre-cycle table, the improvement of learning cycle I & cycle II in Mathematics class IB semester II on addition and subtraction in long series at SDS Islam Annuriyah Cipedak Jagakarsa South Jakarta can be presented in table 4.6 below:

Tabel 4.6 Learning Outcomes and Grade Improvement in Presentations and Graphs

	Pretest/Precycle	**Postest I**	**Postest II**
Achieved	**36,00%**	**56,00%**	**96,00%**
Not Achieved	**64,00%**	**44,00%**	**4,00%**

From table 4.6 above that the results of pre-cycle evaluation to cycle II learning improvement in Mathematics subjects if presented in the form of a diagram, it can be seen in the following diagram:
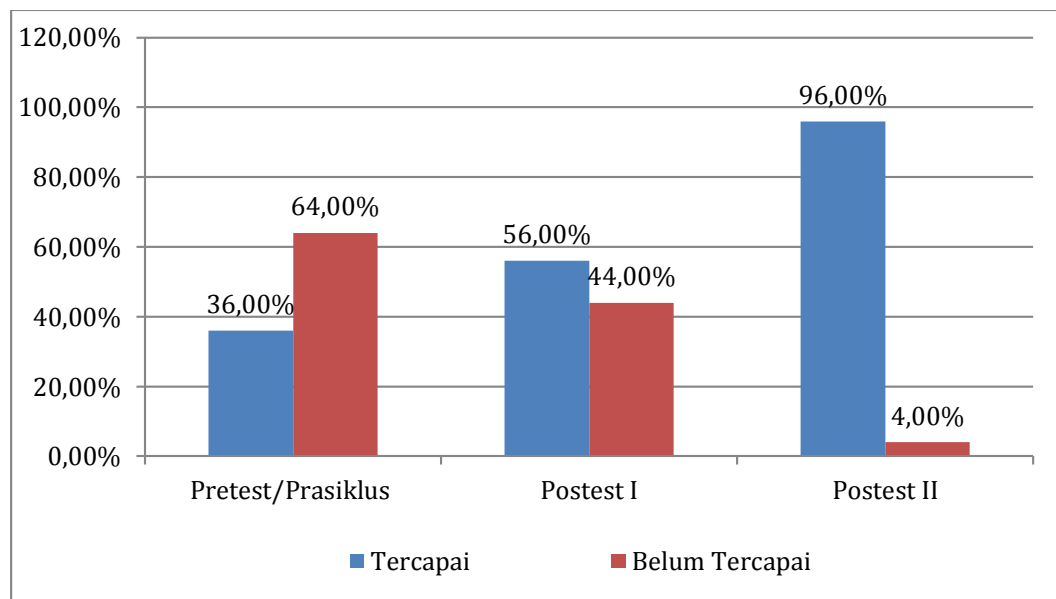

Diagram 4.4 Diagram of Improvement in Student Learning Ability

The use of the jigsaw type Cooperative Learning model and also the media in the form of number cards can effectively foster motivation in improving the ability to solve long addition and subtraction of IB class students. Thus, the learning model and number card media as learning media are not an additional function but have their ownfunctions as a means of helping to realize a more effective and interesting teaching and learning situation.

Conclusion

After the researchers carried out improvements through cycle 1 and cycle II learning with the material of addition and subtraction in the IB class of semester II of the 2017/2018 academic year at SDS Islam An-Nuriyah Jagakarsa, it can be concluded that the jigsaw type cooperative learning model is able to improve students' ability to solve long addition and subtraction.

This improvement occurred in the pre-cycle, cycle 1 and cycle II with evidence of an increase in the presentation of student learning completeness experienced a significant increase after learning improvements were made on the evaluation, before learning improvements there were 9 students or 36.00% of 25 students who reached the KKM. In cycle 1 learning improvement increased, to 14 students or 56.00% of 25 students who reached the KKM. In the improvement of cycle II to 24 students or 96.00% of 25 students who reached the KKM.

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