

Application of Type Cooperative Learning Models Missouri Mathematics Project (Mmp) to Increase Learning Results Math

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Abstract This study aims to improve student learning outcomes fourth grade MI At-Taqwa 50 Mandala Jaya Tarumajaya Bekasi Regency. This research is an action research. The subjects of this study are all students of class IV which amounted to 28 students. Factors studied in the form of improved student learning outcomes. Instruments at each cycle. The data collected at each activity result of learning from cycle implementation, analyzed by using the mean of student learning result and percentage of student learning result which counted by descriptive percentage. The results showed that the average of students in the first cycle of 74.28 with 82% classical completeness increased average in cycle II to 83.92 with 93% classical completeness. When viewed from these results, the model of learning type of Missouri Mathematics Project to improve student learning outcomes in learning mathematics.

Keywords: missouri mathematics project, learning outcomes

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1. Introduction

Education in Indonesia is not new anymore. Indonesia has all levels of education and varies, from Play Group level, elementary and middle level as well as mid-level vocational. From each level has different educational goals. But if researchers can conclude there is a common goal in view of the general objectives of education in Indonesia which refers to Government Regulation No. 19 of 2005 on National Education Standards Article 26 that the purpose of education in Indonesia is to lay the ground of intelligence for the basic level, personality, have noble character as well as having skills and following further education. [1]

Based on the description makes education is very important in life, and can not be separated from everyday life, whether, in one's life, family, and nation and state, the advancement of a nation is determined by the advance of education itself. From a theoretical perspective, education is often interpreted by people differently, depending on the point of view and the theory of education that is believed to be true. Differences in the interpretation of education in an academic context is commonplace, even this can enrich the treasures of human thinking and useful for the development of theory.

The problems that exist in the world of formal education increase from year to year. One of the main problems facing the Indonesian nation is the low quality of formal education at every level of education. The low quality of education in Indonesia can be seen from the results of a report from the 2015 Indonesia for International Student

Assessment (PISA) program reporting 62nd out of 70 countries with competence in science learning achieving an average of 403, averaging 397, and the result of the Mathematics competency earned an average of 386. [2] This is similarly reported by Trends in International Mathematics and Science Studies (TIMSS) in 2015, Indonesia ranked 44th of 56 countries participating with the average score of the students' mathematics score in grade IV that is equal to 397 below the average score of 500.[3] This shows that in particular the primary schools are still very low and the learning outcomes in mathematics learning in Indonesia have not shown satisfactory results.

The result of observation of researcher at MI At-Taqwa School 50 Mandala Jaya Tarumajaya Sub-district of Bekasi Regency, one of the problems of low learning result of Mathematics is that students do not look enthusiastic when teachers explain math materials in front of the class. This is because the concept of mathematics learning taught by the teacher that is classical with through the model of conventional learning without looking at the possibility of application of other learning models in accordance with the types of materials, materials and tools available so that when students are given practice questions, students look less enthusiastic about the practice .

Another problem indicates that the mathematics value in the fourth grade MI At-Taqwa 50 Mandala Jaya Tarumajaya Sub-district of Bekasi District shows that 65 while the Minimum Pre-Minimum Kiter is determined at 73, so still about 50% of the students under 73 or about 50% more who have not reached the KKM. The cause of low student learning outcomes is also due to the use of learning methods is still monotonous with the method of

learning that conversational so that students tend to passive, quickly feel bored in the process of learning in the classroom. Learning outcomes is a broad category that includes learning goals and learning objectives. Determining learning outcomes is necessary before you can make decisions on assessment and teaching strategies. Learning outcomes is overarching terms that involve how you., Your school your school district, or your state specifies what students will learn. [4]

Experts say that learning outcomes are competencies or particular abilities of both cognitive, affective and psychomotor skills that students achieve or master after learning. [5,6,7,8,9] Learning outcomes are a very important thing in improving the ability of students.

Other causes of low student learning outcomes in fourth-grade students MI At-Taqwa 50 Mandala Jaya Tarumajaya District Bekasi Regency is influenced by two factors: internal factors and external factors. Internal factors are from within the student, one of them is the attitude of student learning in the math lesson. At the time the teacher explains the subject matter of mathematics students pay less attention, so the teacher's explanation of the material to be learned cannot be understood and understood. Many students find that mathematics lessons are difficult so when teachers submit lesson maths lesson students are motivated to learn it. External factors are from the teacher and the learning environment when delivering the subject of mathematics teacher only use teacher-centered learning model or teacher center, and one-way folding. Submission of material that is too fast to be poorly understood by students and inappropriate use of media in mathematics subject matter, giving questions that do not measure students' abilities, as well as a never-changing classroom environment or learning environment, such as student seats.

One of the efforts in improving the learning outcomes of fourth-grade students of MI At-Taqwa 50 Mandala Jaya Tarumajaya Sub-district, Bekasi District is by applying the Cooperative Learning Model of the Missouri Mathematics Project (MMP). The Cooperative Learning Model of the Missouri Mathematics Project (MMP) is a structured learning model with the development of ideas and the extension of mathematical concepts.

Some experts point out that the Missouri Mathematics Project (MMP) Cooperative Learning Model requires students to be active in learning with teachers as facilitators who assist and help students discover their knowledge. Students are introduced directly to the real object so as to increase the motivation of students to study and master the subject matter of mathematics. The Cooperative Learning Model of the Missouri Mathematics Project (MMP) is a learning model consisting of several steps, namely (1) introduction or review; (2) development; (3) practice with teacher guidance; (4) independent work; and (5) the cover. [10,11,12,13,14] From that opinion the Cooperative Learning Model of the Missouri Mathematics Project (MMP) is a learning model that is found empirically through research, and consists of several steps, namely daily review, development, controlled exercises / cooperative learning, self-training, and homework.

Prior research conducted by Setyawan et al found that the use of the Missouri Mathematics Cooperative Learning Model (MMP) can be concluded that (1) Mathematics learning achievement of students taught by

using the Missouri Mathematics Cooperative Project (MMP) is as good as the achievement of emotional intelligence that is taught, (2) Mathematical achievement of students with high emotional intelligence is better than students with low media and emotional intelligence, and mathematical achievement of students with emotional intelligence is as good as students with low emotional intelligence in straight-line equation, (3) Every model of learning, mathematical achievement of students with high emotional intelligence is better than students. with mid and low emotional intelligence, and mathematical achievement of students with emotional intelligence is as good as students with low emotional intelligence in straight-line equations (4) Each category of high and middle emotional intelligence, mathematical achievement of students taught by using the Missouri Mathematics Project (MMP) is better than students' mathematical achievement.[15]

Based on the results of the analysis of the above research, the learning of Mathematics of fourth graders of MI At-Taqwa 50 Mandala Jaya Tarumajaya Sub-district of Bekasi Regency needed an effort to improve student learning outcomes through Action Research under the title "Application of Cooperative Learning Model of the Missouri Mathematics Project (MMP) learning mathematics (Action Research fourth grade students MI At-Taqwa 50 Mandala Jaya Tarumajaya Bekasi Regency.

Research focus

Based on the background of the above problem, the researcher focuses the research on Cooperative Learning Model of the Missouri Mathematics Project (MMP) to improve the learning outcomes of mathematics. in grade IV MI At-Taqwa 50 Tarumajaya of Bekasi Regency.

Formulation of the problem

Based on the research focus above can be put forward the following problem formulation:

Will the implementation of the Missouri Mathematics Project Cooperative Learning Model (MMP) improve students' mathematics learning outcomes in fourth grade MI At-Taqwa 50 Mandala Jaya Tarumajaya Sub-district, Bekasi District?

How does the implementation of the Missouri Mathematics Project (MMP) Cooperative Learning Model improve the Mathematics learning outcomes for fourth-grade students of MI At-Taqwa 50 Mandala Jaya Tarumajaya Sub-district, Bekasi District?

2. Methods

The research method used is action research using Kemmis and McTaggart model. Some experts say that Action research is a form of self-reflective enquiry undertaken by participants insiders (including educational) situations in order to improve the rationality and justice of they're own social or educational partition of (b) their understanding of these practices, and (c) the situations in which the practices are carried out. [16,17,18,19]

The research model consists of planning, action, observation, and reflection using the cycle as a rejection of success. The number of cycles adjusted to the level of problems that exist in the class to be studied.

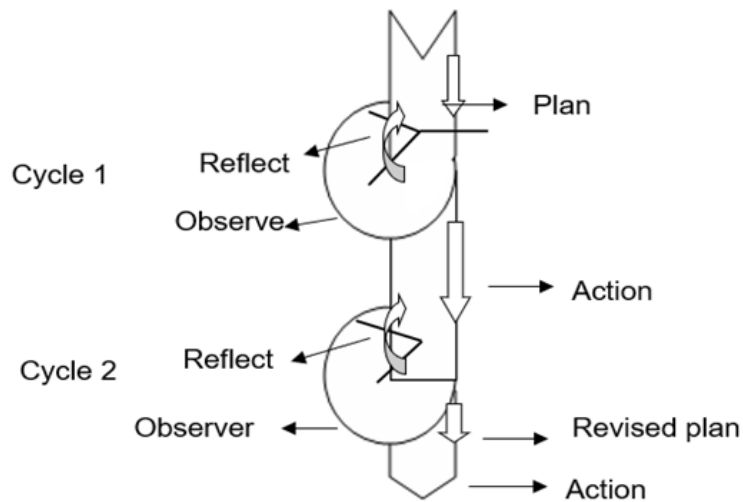


Figure 1. Action cycle of research by Kemmis & McTaggart

3. Results

3.1. Pre-cycle Data Result

The researcher will give a preliminary test at the next meeting to find out the students' learning ability

in class IV using the instrument of multiple choice which amounted to 20 items. Based on the results of these tests show that the average value of the acquisition of student learning outcomes is still under the criteria of successful research. Initial test results are described in table form as follows:

Table 1. Description of Pre-Cycle Results

| Descriptive Statistics | | | | | | | | | |
|------------------------|----------------|--------------------|----------------------|----------------------|------------------|-------------------|------------|-----------------------------|-----------------------|
| | N Statistic | Range Statistic | Minimum Statistic | Maximum Statistic | Sum Statistic | Mean Statistic | Std. Error | Std. Deviation Statistic | Variance Statistic |
| Prasiklus | 28 | 35 | 45 | 80 | 1740 | 62.14 | 2.080 | 11.007 | 121.164 |
| Valid N (listwise) | 28 | | | | | | | | |

Table 2. Pre-Cycle Frequency Distribution

| Prasiklus | | | | | |
|-----------|-------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 45 | 2 | 7.1 | 7.1 | 7.1 |
| | 50 | 8 | 28.6 | 28.6 | 35.7 |
| | 60 | 2 | 7.1 | 7.1 | 42.9 |
| | 65 | 5 | 17.9 | 17.9 | 60.7 |
| | 70 | 5 | 17.9 | 17.9 | 78.6 |
| | 75 | 5 | 17.9 | 17.9 | 96.4 |
| | 80 | 1 | 3.6 | 3.6 | 100.0 |
| | Total | 28 | 100.0 | 100.0 | |

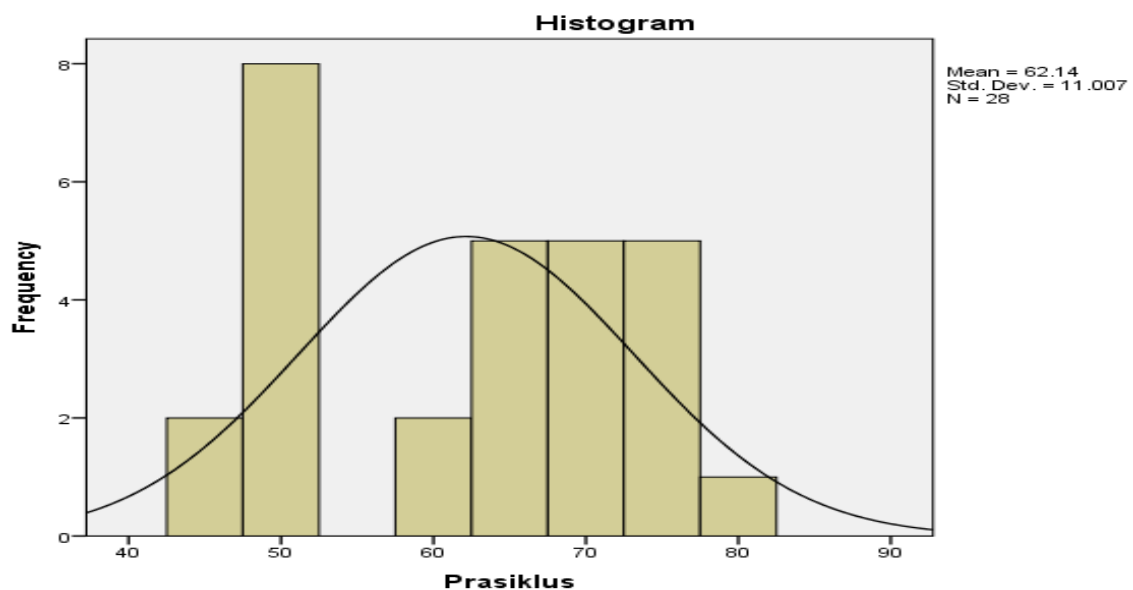


Figure 2. Graph the percentage of learning outcomes of fourth-grade Students Pre-cycle

Based on Table 1 and Table 2 above, it shows that the average score of 28 students is 62.14 with the maximum value being 80 and the minimum value is 45. The defined minimum criteria are 70, this indicates that 17 students are getting scores <70 students or 61% of unfinished students and 11 students who scored > 70 students or 39% of completed students. It shows that the pre-cycle of obtaining student learning outcomes has not been maximal, so it will be done by using the Cooperative Learning Model of the Missouri Mathematics Project (MMP) by improving the learning outcomes of mathematics.

3.2. Cycle Data Result I

In cycle I, the qualification of the percentage of students is good enough. This is shown from the grade average value reached 64. With the percentage of classical completeness of 52.77%. Students who scored above the KKM were 23 students (582%) and students who scored under the KKM were 5 students (18%). Here the value of the students in learning mathematics test cycle I am as follows:

Table 3. Description of Evaluation of End of Cycle I

| Descriptive Statistics | N | Range | Minimum | Maximum | Sum | Mean | | Std. Deviation | Variance |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|----------------|-----------|
| | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic | Statistic |
| Siklus1 | 28 | 40 | 50 | 90 | 2080 | 74.29 | 1.600 | 8.467 | 71.693 |
| Valid N (listwise) | 28 | | | | | | | | |

Table 4. Table Frequency Test Evaluation End of Cycle I

| Siklus1 | | | | | |
|---------|-------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 50 | 1 | 3.6 | 3.6 | 3.6 |
| | 60 | 2 | 7.1 | 7.1 | 10.7 |
| | 65 | 2 | 7.1 | 7.1 | 17.9 |
| | 70 | 5 | 17.9 | 17.9 | 35.7 |
| | 75 | 4 | 14.3 | 14.3 | 50.0 |
| | 80 | 13 | 46.4 | 46.4 | 96.4 |
| | 90 | 1 | 3.6 | 3.6 | 100.0 |
| | Total | 28 | 100.0 | 100.0 | |

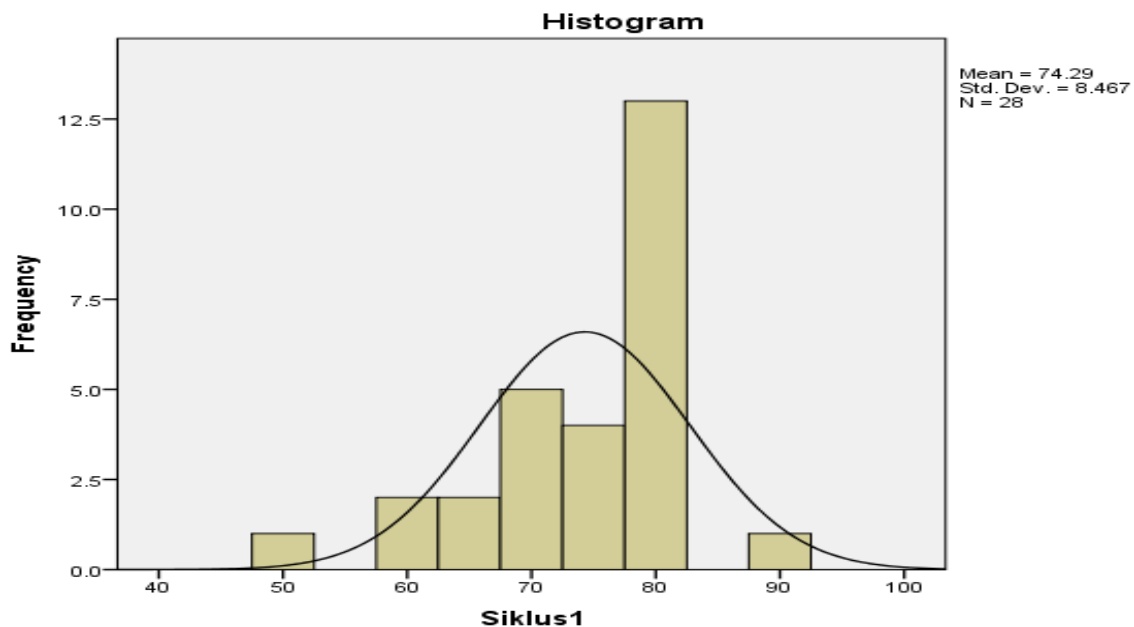


Figure 3. Graph the percentage of learning outcomes of Class IV Students Cycle I

Based on Table 3 and Table 4 above, it shows that the average score of 28 students is 74.29 with a maximum value of 90 and the minimum is 50. The defined Minimum Criterion is 70, this indicates that there are 23 students who get scores <70 students or 82% of unfinished students and 5 students who scored > 70 students or 18% of completed students. It shows that in cycle 1 to obtain student learning outcomes have maximum however at the average value is still low.

3.3. Cycle Data Result II

In cycle II, the qualification percentage of students is good. This is shown from the value of the grade average reached 83.92. Students who scored above KKM were 26 students (93%) and students who scored under KKM were 2 students (7%). Here the value of the students in learning mathematics test cycle II is as follows:

Table 5. Description of Evaluation of End of Cycle II

| Descriptive Statistics | | | | | | | | | |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|----------------|-----------|
| | N | Range | Minimum | Maximum | Sum | Mean | | Std. Deviation | Variance |
| | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic | Statistic |
| Siklus2 | 28 | 35.00 | 60.00 | 95.00 | 2350.00 | 83.9286 | 1.61338 | 8.53719 | 72.884 |
| Valid N (listwise) | 28 | | | | | | | | |

Table 6. Table Frequency Test Evaluation End of Cycle II

| Siklus2 | | | | | |
|---------|-------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 60.00 | 1 | 3.6 | 3.6 | 3.6 |
| | 65.00 | 1 | 3.6 | 3.6 | 7.1 |
| | 70.00 | 1 | 3.6 | 3.6 | 10.7 |
| | 75.00 | 2 | 7.1 | 7.1 | 17.9 |
| | 80.00 | 5 | 17.9 | 17.9 | 35.7 |
| | 85.00 | 4 | 14.3 | 14.3 | 50.0 |
| | 90.00 | 13 | 46.4 | 46.4 | 96.4 |
| | 95.00 | 1 | 3.6 | 3.6 | 100.0 |
| | Total | 28 | 100.0 | 100.0 | |

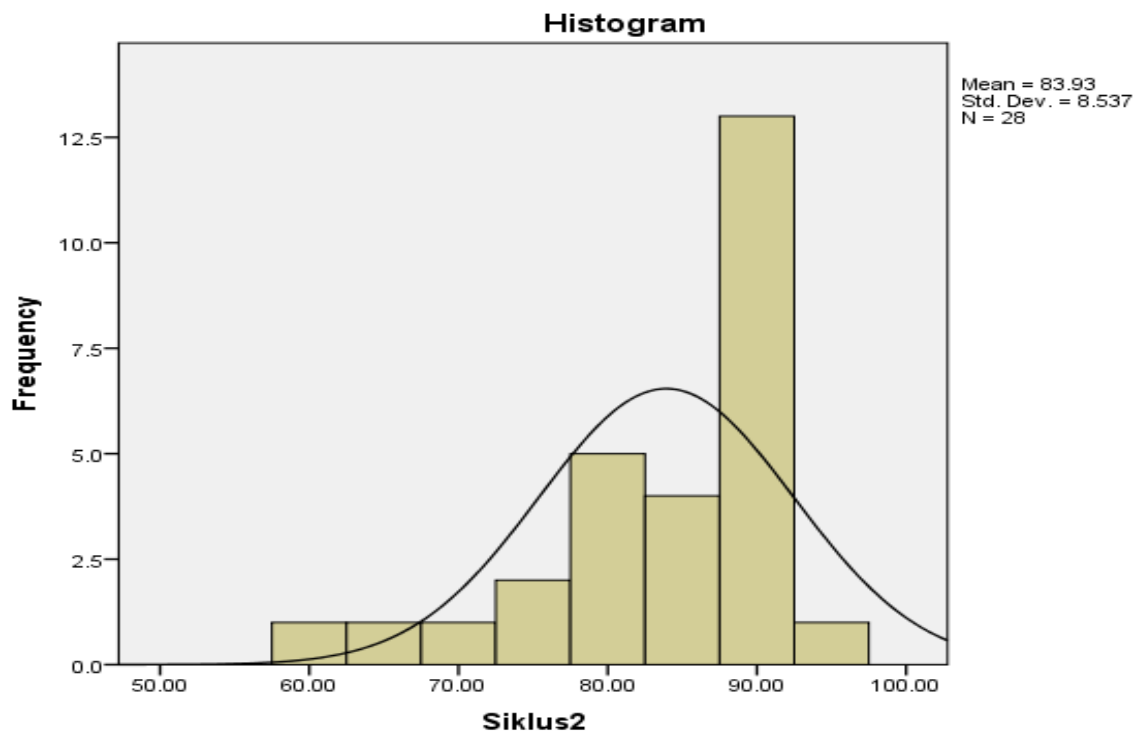


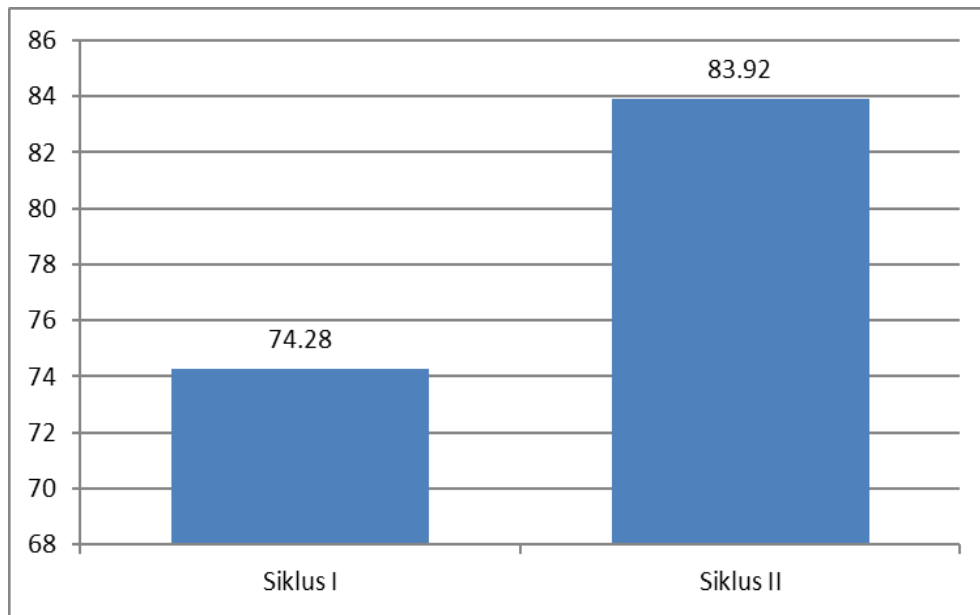
Figure 4. Graph the percentage of learning outcomes of Class IV Students Cycle II

After observation or observation, it can be done a reflection of the actions that have been done in the second meeting II cycle II. During the learning process at meeting II, the shortcomings that occur that affect the learning process can already be overcome. In addition, the barriers to learning can be solved by the actions taken. Based on the result of student observation as many as 28 students. Results of the evaluation results obtained 26 students or 93% complete learning, and 2 students or 7% unfinished learning. In other words, more than 80% of complete students learn, so the cycle is stopped in cycle II of meeting II.

4. Discussion

Based on the evaluation test cycle I showed that the average value of student learning outcomes is 74.28 with a total score of 2080. From these results, has not reached the success indicator so it should be continued into cycle II. In cycle II the average value of learning results increased to 83.92 with a total score of 2350. so it has reached the indicator of success. The calculation of the average recapitulation of student learning outcomes in cycle I and cycle II is presented in the following bar chart.

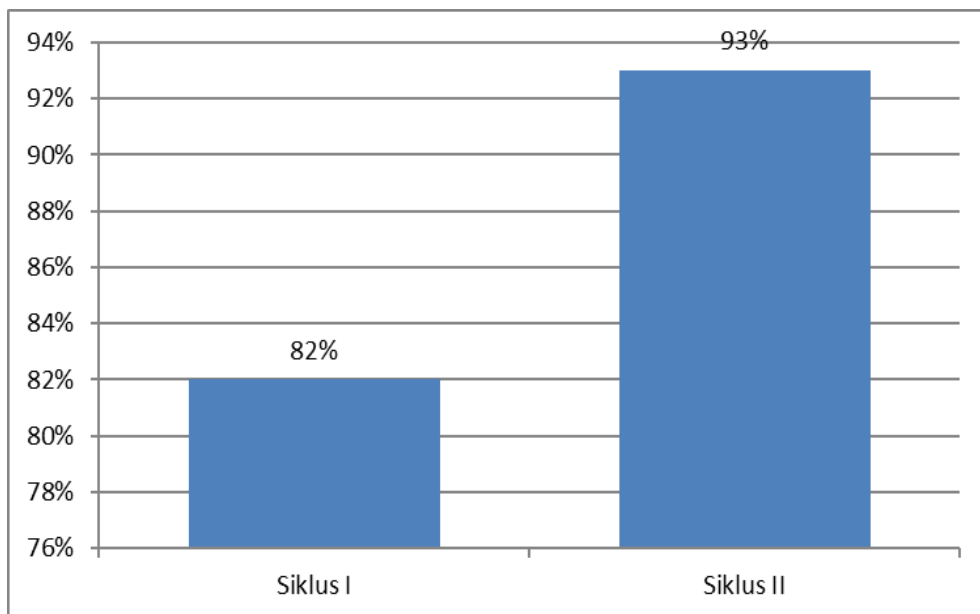
Table 7. Student Learning Outcomes in cycle I and cycle II



| Parameter | Cycle I | Cycle II |
|-----------|---------|----------|
| Amount | 2080 | 2350 |
| Average | 74.28 | 83.92 |

Based on the first cycle evaluation test students who scored above 70 were 23 students. So that the classical completeness achieved is 82%. From these results, it is still minimal in achieving the success indicator so proceed to cycle II. In the second cycle students who score above 70 as many as 26 students with achieved classical completeness increased to 93%. So it has reached the indicator of success. The calculation of classical thoroughness recapitulation of student learning cycle I and cycle II is presented in the following diagram.

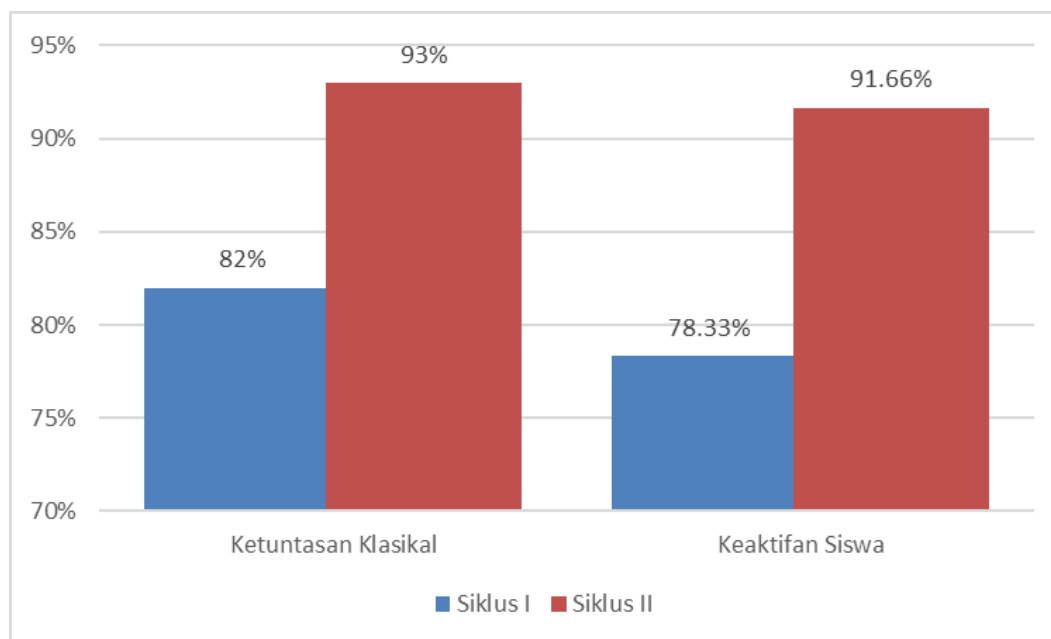
Table 8. Results Student Classical Exhaustiveness in the first cycle and cycle II



| Parameter | Cycle I | Cycle II |
|--------------------------|-------------|----------|
| Classical Exhaustiveness | 82% | 93% |
| Criteria | Pretty Good | Good |

Based on the analysis of written tests and observations of students showed the results of learning and student learning activity on learning mathematics cycle II increased compared to Cycle I. The diagram of learning

outcomes and student learning activities on learning mathematics with learning models of the Missouri Mathematics Project. can be seen in the following bar chart:

Table 9. The result of Classical Exhaustiveness and Activity of Student Learning cycle I and cycle II

In the first cycle, the average of students' learning achievement reaches 78%, then in cycle II, the mean of student learning activeness increased to 91%. In the first cycle of student's classical completeness of learning achievement reaches 82%, then in cycle II, the average completeness of classical student learning increased to 93%. Then, for the average of student learning outcomes in cycle I reached 74.28. While the average of student learning outcomes in cycle II increased to 83.92. Thus, from the results of the cycle I and cycle II can be seen that the learning model of the Missouri Mathematics Project can improve student learning outcomes in learning mathematics. If student learning activeness, the average of student learning outcomes and classical completeness increases, then the indicator is achieved.

5. Conclude

The learning model of the Missouri Mathematics Project can improve students' learning outcomes in the fourth-grade mathematics learning of MI At-Taqwa 50 Mandala Jaya Tarumajaya Sub-district, Bekasi District. This can be seen from the average of students in the first cycle of 74.28 with 82% classical completeness increased average in cycle II to 83.92 with 93% classical completeness.

References

- [1] Indonesia, P. R., Government Regulation No. 19 of 2005 on national education standards. (Ministry of National Education Republic of Indonesia, 2005).
- [2] OECD, PISA 2015 Results: What Students Know and Can Do-Student Performance in Mathematics, Reading, and Science (PISA: OECD Publishing, 2016).
- [3] TIMSS, Highlights from TIMSS and TIMSS Advanced 2015 Mathematics and Science Achievement of U.S. Students in Grades 4 and 8 and in Advanced Courses at the End of High School in International Context (Washington: NCES, IES, U.S. Department of Education Potomac Center Plaza, 2016).
- [4] Neal Shambaugh, and Susan G Magliaro, *Instructional Design*. (Boston: Person, 2006), p. 88
- [5] Kusnandar, *Authentic Assessment*. (Jakarta: RajaGrafindo Persada, 2013), p. 62.
- [6] Nana Sudjana. *Assessment of Learning Outcomes Teaching and Learning Process* (Bandungremaja Rosda Karya, 2009). p. 22.
- [7] Aswin Saputra., Comparison of RBL and PBL on Student Learning Mathematics Learning Outcomes at MAN 12 Jakarta. (Research and Development Journal of Education Vol 2 No. 1 October 2015 ISSN 2406-9744: Lecturer of Informatics Engineering Program, Faculty of Engineering, Mathematics, and Science University Indraprasta PGRI, 2015), p.6.
- [8] Muhammad Irwan Nur, Moh. Salam, Hasnawati., Effect of applying cooperative learning model type numbered heads together (NHT) to the results of learning mathematics students of class VII SMP Negeri 1 Tongkuno. (Journal of Mathematics Education Research Volume 4 No. 1 January 2016: Department of Mathematics Education FKIP Halu University Ole) p. 103-104.
- [9] Husnul Khotimah, the influence of quantum teaching model with the method of discussion on mathematics learning outcomes, Proceedings of Panel Discussion "Being a Learning Teacher" (Alumni Family of Indraprasta PGRI University Jakarta, April 8, 2017: Mathematics Education Program, Faculty of Engineering, Mathematics and IPA Universitas Indrapasta PGRI, 2017), p. 79
- [10] Rachma Hanan Tiaso., Elly Arliani., Missouri Mathematics Project Learning Model with Two Stay Two Stray Method (National Seminar on Mathematics and Mathematics Education: UNY, 2015)
- [11] I Handayani., RL Januar., SE Purwanto., The effect of the Missouri mathematics project on student learning mathematical problem-solving abilities (ZDM-International Journal on Mathematics Education, Journal of Physics: Department of Mathematics Education, University Muhammadiyah Prof. DR. Hamka, Indonesia, 2018).
- [12] Winardi., Dwijanto., Mathematical Literacy Capability Analysis through the Missouri Mathematics Project Model with the Open-Ended Approach (Unnes Journal of Mathematics Education Research: Universitas Negeri Semarang, 2017).
- [13] N. Riski Utami Sari., N. Dantes., I M. Ardana., The Influence of Missouri Mathematics Project's Learning Model to Ability to Solve Mathematical Stories from Verbal Ability (Journal of Graduate Program of Ganesha University of Education: Ganesha Singaraja University of Education, Indonesia, 2014)
- [14] Tatik Wulandari., Hidayah Ansori., Influence of Missouri Mathematics Project Learning Model to Students' Ability in Solving Problems (EDU-MAT Journal of Mathematics Education: Mathematics Education FKIP Universitas Lambung Mangkura, 2013).

- [15] Indra Setyawan., Budiyono., Isnandar Slamet., The Comparison of Missouri Mathematics Project and Teams Games Tournament from Emotional Quotient Eight Grade Student of Junior School (The 4th International Conference on Research, Implementation, and Education of Mathematics and Science: American Institute of Physics, 2017).
- [16] David Hopkins, A Teacher's Guide to Classroom Research translations Achmad Fawaid (Yogyakarta: Pustaka Pelajar, 2011), p. 87.
- [17] Wijaya Kusumah and Dedi Dwitagama, Know Your Classroom Action Research (Jakarta: Index, 2011), p. 121
- [18] Suroso, Classroom Action Research (Jogjakarta: Pararalon, 2009).
- [19] Trianto, Complete Class Action Research Guide (Jakarta: Achievement of Library, 2011), p. 11.