

**IMPROVING STUDENTS' MATHEMATICS LEARNING OUTCOMES
THROUGH THE MISSOURI MATHEMATICS PROJECT (MMP)
LEARNING MODEL WITH REALISTIC MATHEMATICS
APPROACHES FOR CLASS VII STUDENTS OF
SMP YP PGRI 4 MAKASSAR**

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ABSTRAK

Penelitian ini bertujuan untuk mendeskripsikan peningkatan hasil belajar matematika siswa dengan menggunakan Model Pembelajaran Missouri Mathematics Project (MMP) dengan Pendekatan Realistic Mathematics. Instrumen yang digunakan dalam penelitian ini adalah tes kemampuan hasil belajar matematika siswa, angket respon siswa terhadap model pembelajaran Missouri Mathematics Project (MMP) dengan Pendekatan Realistic Mathematics, dan pedoman observasi guru dan siswa. Analisis data dilakukan dengan dua teknik, yaitu kuantitatif dan kualitatif. Data hasil observasi dan angket respon siswa dianalisis secara kualitatif, sedangkan tes hasil belajar matematika siswa dianalisis secara kuantitatif dan diperkuat dengan dokumentasi. Penelitian ini mengungkapkan bahwa model pembelajaran Missouri Mathematics Project (MMP) dengan pendekatan Realistic Mathematics (PMR) dapat meningkatkan hasil belajar matematika siswa. Kondisi ini terlihat pada peningkatan hasil belajar, aktivitas siswa, aktivitas guru, dan angket respon siswa dari siklus I ke siklus II. Nilai rata-rata yang diperoleh pada siklus I adalah 61,62 dari skor ideal 100 dengan ketuntasan 19,048%, dan pada akhir siklus II meningkat menjadi 79,14 dari skor ideal 100 dengan ketuntasan hasil belajar 85,714. %. Standar deviasi pada siklus pertama adalah 10,462 dan standar deviasi pada siklus terakhir atau siklus kedua adalah 9,361. Oleh karena itu, model pembelajaran Missouri Mathematics Project (MMP) dengan Pendekatan Realistic Mathematics merupakan salah satu model pembelajaran yang dapat meningkatkan hasil belajar matematika siswa karena merupakan salah satu model yang menarik dan memotivasi siswa untuk lebih aktif dalam pembelajaran.

Kata Kunci: *Hasil Belajar Matematika Siswa, Model Pembelajaran Missouri Mathematics Project (MMP) dengan Pendekatan Realistis*

ABSTRACT

This study aims to describe the improvement of students' mathematics learning outcomes using the Missouri Mathematics Project (MMP) Learning Model with a Realistic Mathematics Approach. The instruments used in this study were the ability test of students' mathematics learning outcomes, student response questionnaires to the Missouri Mathematics Project (MMP) learning model with the Realistic Mathematics Approach, and teacher and student observation guidelines. Data analysis was carried out in two techniques, namely quantitative and qualitative. The data from the observations and questionnaire responses of students were analyzed qualitatively, while the test of students' mathematics learning outcomes was analyzed quantitatively and strengthened by documentation. This study reveals that the Missouri Mathematics Project (MMP) learning model with the Realistic Mathematics approach (PMR) can improve students' mathematics learning outcomes. This condition can be seen in increased learning results, student activities, teacher activities, and student response questionnaires from cycle I to cycle II. The average value obtained in the first cycle is 61.62 from an ideal score of 100 with a completeness of 19.048%, and at the end of the second cycle, it increases to 79.14

from an ideal score of 100 with a completeness of learning outcomes of 85.714%. The standard deviation in the first cycle is 10,462 and the standard deviation in the final cycle or the second cycle is 9,361. Therefore, the Missouri Mathematics Project (MMP) learning model with the Realistic Mathematics Approach is one of the learning models that can improve students' mathematics learning outcomes because it is one of the models that attracts and motivates students to be more active in learning.

Keywords: *Result of students learning mathematics, Missouri mathematics Project (MMP) Learning model with Approach Realistic*

INTRODUCTION

Education is defined as a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, good morals, and skills needed for themselves, society, nation, and country. (Sugiyono, 2019). According to Hartati and Simanullang (2018), it is emphasized that education is an effort to direct students into the learning process so that they can obtain learning objectives according to what is expected. Education has a very important role in life. Trianto (in Widiantri et al, 2016) states that education must look far ahead and think about what students will face in the future.

Mathematics is one of the subjects that will be taught in SD/MI, as said by Prihandoko (in Widiantri et al, 2016) that "mathematics is a basic science that has become a tool for studying other sciences". Mathematics is one of the fields of study that exist at all levels of education, from elementary school to university level. Even mathematics is taught in kindergarten informally. Mathematics in higher education is defined as a science with an abstract object.

Based on the results of observations by conducting direct interviews with mathematics teachers at SMP YP PGRI 4 Makassar on October 15, 2021, researchers have found several problems, namely: (1) lack of active learning from students, this is because the learning process is still centered on teachers and little involvement of students. As a result, in the learning process, the interaction between teachers and students is very low so in situations like this students feel bored, (2) teacher-centered learning makes it difficult for students to find their mathematical ideas so very little material or knowledge is received by students. (3) The lack of student learning outcomes is caused by the lack of students' abilities. The Minimum Completeness Criteria (KKM) in mathematics is 75. Of the 21 students at SMP YP PGRI 4 Makassar, only 7 people can fulfill the KKM, with the lowest score being 35 and the highest score being 85.

Based on the phenomena that occur in schools, this is a challenge for teachers to choose learning models that are in accordance with the subjects that students are interested in. Teachers must choose the right model according to the subject matter to create effective learning. Teachers must prepare models, methods, and learning approaches that are in accordance with the characteristics of students so that the mathematics learning process takes place more actively, creatively, effectively, and funly. One of the learning models and learning approaches offered to make students active in the learning process is by using the Missouri Mathematics Project (MMP) model and the Realistic mathematics approach.

Rosyid (2017); Hartono et al (2020); Moses (2017); Ansori and Aulia (2015); Marliani (2015) explained that the Missouri Mathematics Project (MMP) Learning Model is considered effective for improving students' mathematics learning outcomes, achieving students' mathematical connection abilities, and solving problems. This is because the Missouri Mathematics Project (MMP) Learning Model accepts more material and the learning process is structured and can activate students by providing project worksheets in every meeting.

However, from several studies that have been carried out, they mostly use the MMP learning model and the Realistic mathematics approach with the classroom action research method, so we are more interested in seeing how the results of the student's mathematics learning process by applying the MMP learning model with a Realistic mathematics approach. Therefore, it is very important to see how the learning process is by applying the MMP model with a Realistic Mathematics approach.

The superiority of the Missouri Mathematics Project (MMP) learning model is one of the problem-solving-oriented learning models. Learning activities facilitate students to understand various mathematical problems that are solved individually and in groups in the form of practice questions to apply the knowledge gained. The process of applying this material can make learning more effective because it gets a lot of material from various material developments in practice questions that are presented to students (Isrok'atun, 2018). This is in line with the opinion of Agoestanto and Savitri (in Marlioni, 2015) stating that "the Missouri Mathematics Project (MMP) learning model demands student activity in learning because the teacher is only a facilitator who accompanies and only helps students find their knowledge". Missouri Mathematical Project (MMP) trains students to be independent, cooperative, and creative in solving math problems.

The characteristic of the Missouri Mathematics Project (MMP) learning model is the presence of a project assignment sheet (student worksheet), where the project assignment is expected to be able to improve students' mathematics learning outcomes which are carried out by completing the project individually or in groups (Marlioni, 2015).

The Realistic Mathematics Approach (PMR) is an approach that can be used as an alternative to create a democratic and character education system. Such learning makes students as learning subjects that must play an active role in the construction of formal mathematical knowledge, namely dominantly in the process of finding facts, concepts, operations, and formal mathematical principles in finished form. The PMR approach can be used as an alternative to increase student learning independence (Simanullang, 2020). Realistic Mathematics Approach (PMR) requires students to learn actively in collaboration with fellow students. Students are given the opportunity to rediscover and reconstruct mathematical concepts from contextual problems given at the beginning of learning so that students have a good understanding of these mathematical concepts (Lestari and Sofyan, 2014).

This research is a type of classroom action research that has been carried out for two cycles at SMP YP PGRI 4 Makassar, the first cycle was carried out for 4 meetings and the next cycle was also carried out for 4 meetings. Supporting instruments in this study were learning outcomes tests, student responses, and teacher and student activities. Before the supporting instrument is used, content validation and construct validation are carried out first.

METHOD

This type of research is Classroom Action Research using the Missouri Mathematical Project (MMP) learning model with a Realistic Mathematics approach. This research has been carried out in two cycles according to the achievements that have increased in the learning process. Each cycle consists of four stages, namely: (a) planning, (b) acting, (c) observing, and (d) reflecting (Rosyid, 2017).

RESULT AND DISCUSSION

The data collection process was carried out in two cycles. Cycle I lasts 4 stages which are described as follows:

1. Planning

Researchers have made a learning implementation plan (RPP) which is carried out on the implementation of the action in accordance with the material and learning methods that have been determined. Observation sheets have also been made to observe the condition of students in the learning process by applying the Missouri Mathematics Project (MMP) learning model and the Realistic mathematics approach according to the achievement indicators when carrying out the action. Then the test of learning outcomes has also been prepared, and researchers have designed student worksheets (LKS). In addition, the researcher has created and compiled an evaluation tool that is given at the end of the first cycle, made and compiled a student response questionnaire to the learning model used, prepared colleagues to act as observers, and helped document activities during the study. According to Solihati (2021) planning in the first cycle is used as a reflection to conduct research in the second cycle, while the second cycle aims to determine the increase in learning outcomes of material, reading, and writing number symbols from students after improvements are made to the process of implementing the teaching and learning process based on cycle reflection I.

2. Implementation

Cycle I actions were carried out at meetings I, II, III and IV on 10 May 2022, 12 May 2022, 17 May 2022, and 19 May 2022. The action phase in cycle I was carried out according to the lesson plan (RPP) using the model Missouri Mathematics Project (MMP) learning with Realistic Mathematics (PMR) approach that has been prepared. Observers observe the learning process that takes place in accordance with the observation guidelines that have been prepared. According to Rahman (2017), in carrying out teaching and learning process activities, teachers are faced with various problems, one of which is the difficulty of students in learning mathematics. These difficulties include difficulties in understanding concepts, problem solving (mathematical problem solving), mathematical reasoning (mathematical reasoning), mathematical connections (mathematical connection), translation of story questions, mathematical communication (mathematical communication), and others.

3. Observation

Observations were made by looking at student activities, teacher activities, student responses, and student mathematics learning outcomes.

Tabel 1. Statistics of Student Mathematics Learning Outcomes Scores in Cycle I

STATISTICS	STATISTICAL VALUE
Subjek	21
Skor ideal	100
Maksimum	76
Minimum	43
Rentang Skor	33
Mean	61,62
Median	65
Modus	53
Variansi	109,448
Standar Deviasi	10,462

4. Reflection

Based on the results of reflection in the first cycle, the average score of students' mathematics learning outcomes was 61.62 which had not reached the KKM standard score of 75, and the percentage of students' complete mathematics learning outcomes was 19.048% which had not reached the classical standard of 85% above the school KKM. There are still many students who do not understand and are less thorough in solving problems, there are still students who do not discuss with their group friends, teachers who have not fully carried out

all learning activities in accordance with the steps and learning implementation plans (RPP), and there are still many students who do not pay attention teacher when explaining the material. According to Solihati (2021), the synthesis in this cycle is in the learning process that has been carried out, from planning to the end of the activity, the results have not been able to increase student understanding in accordance with what is expected by the teacher. This is because there are still weaknesses encountered so that they are still obstacles in achieving increased student understanding so that learning needs to be carried out in the next second cycle. Problems in cycle I will then be corrected in cycle II.

After reflecting on the results of the implementation of the first cycle, it will obtain an overview that needs to be done in the second cycle as an improvement from the first cycle.

1. Planning

In cycle II, the researcher first went back to planning. Cycle II basically repeats the steps in cycle I, but cycle II is carried out to correct errors and deficiencies in cycle I so that the results obtained are better and improve. As stated by Solihati (2021), the results of observations of the learning process in cycle II show that students are starting to be more active in learning activities, this is because the teacher has provided a lot of guidance and additional enrichment or explanations.

2. Implementation

The implementation phase in cycle II was carried out for 4 meetings, namely meetings V, VI, VII and VIII on 24 May 2022, 26 May 2022, 31 May 2022, and 2 June 2022. The action phase in cycle II was carried out in accordance with the learning implementation plan (RPP) using the Missouri Mathematics Project (MMP) learning model with a Realistic Mathematics (PMR) approach that has been prepared. Observers observe the learning process that takes place in accordance with the observation guidelines that have been prepared. According to Rahman (2017), in carrying out teaching and learning process activities, teachers are faced with various problems, one of which is the difficulty of students in learning mathematics. These difficulties include difficulties in understanding concepts, problem solving (mathematical problem solving), mathematical reasoning (mathematical reasoning), mathematical connections (mathematical connection), translation of story questions, mathematical communication (mathematical communication), and others.

3. Observation

Data on students' mathematics learning outcomes in cycle II were obtained through giving a final test of the cycle in the form of a description test after teaching and learning activities for 3 meetings. As for the analysis of the description of the value of students' mathematics learning outcomes using the Missouri Mathematics Project (MMP) learning model with a Realistic Mathematics (PMR) approach, they are as follows.

Tabel. 2. Statistics of Student Mathematics Learning Outcomes Scores in Cycle II

STATISTICS	STATISTICAL VALUE
Subjek	21
Skor ideal	100
Maksimum	91
Minimum	53
Rentang Skor	38
Mean	79,14
Median	80
Modus	80
Variansi	87,629
Standar Drviasi	9,361

4. Reflection

The second cycle has seen an increase during the teaching and learning process. Where the teacher has carried out activities well according to the steps in the lesson plan (RPP) and students can adapt to the Missouri Mathematics Project (MMP) learning model with a Realistic Mathematics (PMR) approach. This can be seen from students being active in working on worksheets in groups and individually, active in discussing with group friends, and eager to learn how to show progress. Based on the data obtained in cycle II, the average student learning outcomes have increased. They have achieved indicators of success by getting results above the KKM standard that has been set at school, namely 75. As stated by Solihati (2021), after taking action in cycle II for the target class by the planning and learning scenario, the learning process runs well. It is perfect and the classroom atmosphere is conducive.

CONCLUSION

Based on the results of classroom action research conducted in class VII SMP YP PGRI 4 Makassar, it was concluded that using the Missouri Mathematics Project (MMP) learning model with a Realistic Mathematics (PMR) approach could improve students' mathematics learning outcomes. This condition can be seen from the results of increased learning, student activities, teacher activities, and student response questionnaires from the first cycle with a percentage of completeness of 19.048% which increased in the second cycle with the percentage of completeness of 85.714%.

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