

IMPLEMENTATION OF REALISTIC MATHEMATICS EDUCATION (RME) BASED ON LESSON STUDY FOR LEARNING COMMUNITY (LSLC) TO IMPROVE STUDENTS' MATHEMATICAL UNDERSTANDING

Ainun Najah^{1*}, Moh. Atikurrahman², Saiful³

^{1,2,3}Mathematics Education, Faculty of Education, Universitas Ibrahimy Situbondo
Jl. KHR. Syamsul Arifin Situbondo, Indonesia

ABSTRACT

This study aims to investigate the implementation of Realistic Mathematics Education (RME) approach based on Lesson Study for Learning Community (LSLC) as an effort to improve students' mathematics understanding. The research method used was classroom action research involving 21 students of grade VII of SMP Negeri 1 Arjasa Kalinganyar Sumenep Madura. This research consists of two implementation cycles, where each cycle consists of planning, implementation, observation, and reflection with three instruments, Open Class Observation, tests and documentation. The results of this study indicate that the implementation of LSLC-based RME is able to have a positive impact on student understanding. Data analysis showed an increase of 20% seen from open class and an increase of 31% from the test results. This research shows that the LSLC-based RME approach can be an effective alternative in improving the quality of mathematics learning in the classroom. Collaboration between teachers and curriculum development that focuses on realistic concepts in mathematics make an important contribution in strengthening students' understanding. The implication of this finding is that the application of this approach should be considered in the effort to improve mathematics learning in schools.

Keywords: Realistic Mathematics Education (RME), Lesson Study for Learning Community LSLC, Students' Mathematics Understanding, Classroom Action research.

Introduction

Maths is a very important basic science because it is often used in solving other science subjects or in everyday life. (Matematis & Council, 2019). Because mathematics is a means for students to train their ability to think logically, analyse, systematically, critically, creatively and is a discipline that helps in developing the thinking power of each student (Rohman, n.d.). However, there are several problems that still hinder students in learning mathematics, including: the low understanding of student mathematics as well as the lack of teacher preparation in teaching, it is caused by the influence of learning strategies that are less interesting and seem difficult, so that students first feel bored before learning it.

Efforts that can be made are to understand the difficulties or obstacles experienced by students in learning concepts, procedural and students' ability to solve the problems presented. (Fauzi, 2019). This is generally known as understanding. As stated by the driver in Nur Karimah, that mathematical understanding is the ability to explain a situation or action, and can explain and explain back the essence of the material or concepts obtained independently. (Sari & Yuniati, 2018). This is also reinforced by Mayer's opinion in (Posman Rambe & Nurwahidah, 2023) that understanding is a fundamental aspect that in its implementation must include the main thing that is related to the object itself and not related to it. (Tanu et al., 2018) Tommy Tanu wijaya stated that most researchers have revealed that in understanding, students are expected to be

able to master three things, among others: 1) Translation, at this stage students are expected to be able to convert word problems into mathematical symbols, 2) Interpretation, at this stage students tend to have an understanding in interpreting a problem in the form of words, 3) Extrapolation, students tend to have an understanding in estimating the answer to a problem in the form of a picture. (Khairunnisa et al., 2022). The understanding itself has been stated by many previous researchers that understanding in mathematics involves two things, including 1) Computational understanding, which is the understanding that students have in restating a mathematical concept they have learned. 2) Functional understanding, which is an understanding that students have not only in restating a concept but students are able to modify a concept with other concepts. (Fahrudhin & Zuliana, 2018). Understanding itself usually occurs in students during learning activities so that it can be said that understanding is closely related to student learning activities. Classroom learning activities can involve students in different understanding abilities. So it is necessary to have a learning design that can make students become more active during class learning. One of the lessons that is considered appropriate to train students' understanding of mathematics is to use the Realistic Mathematic Education (RME) approach.

Realistic Mathematic Education is an approach that is implemented by placing the reality that exists in everyday life (Yanti et al., 2022) by using real problems that are in accordance with the environment and student characters as a starting point for developing ideas in learning. (Hobri, 2016), (Atikurrahman et al., 2019) RME focuses on things that are real to students. RME is also an approach that creates a meaningful learning condition so that it can improve students' understanding of mathematics through real concepts.

The implementation of RME approach can be developed through lesson study for learning community (LSLC). Lesson study is a model of professional development of educators through learning assessment activities conducted by a group of educators collaboratively and sustainably to improve the quality of learning. (Soepriyanti et al., 2022). Lesson study is also a scientific activity for teachers to share and strategise in developing their theories to share good practices. (Penelitian & Cisarupankelas, 2013). In lesson study teachers collaborate in learning the content and instruction through observing lessons and discussing them. Through this approach they endeavour to improve the quality of their teaching. Learning community itself is the result of lesson study, to improve students' learning activities so that they can work together in collaboration. So the current application of Lesson Study is developed on Learning Community. In general, it is called LSLC. The stages in lesson study include: plan, do, and see.

It can be concluded that, learning mathematics through the Realistic Mathematics Education (RME) approach based on Lesson Study for Learning Community (LSLC) students are expected to be more challenged to learn better, create interaction and collaboration so as to form a good understanding. Then the teacher collaboratively conducted a review of the learning that was carried out.

2. Research methods

This type of research is classroom action research. Classroom action research (PTK) with John Elliot model, which is used by teachers to observe the application of Realistic Mathematic Education (RME) Based on Lesson Study For Learning Community (LSLC) so that students' understanding of mathematics increases. The research stages consisted of 2 cycles, each cycle consisting of four steps, namely: (1) planning, (2) action implementation (3) observation (4) reflection. The following is the form of design used can be seen in the following figure:

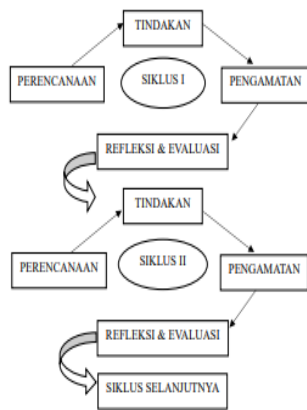


Figure 1. Teori John Elliot

This research was conducted at SMPN 1 Arjasa. The subjects of this study were students of class VIII-1, totalling 21 people. Data collection techniques using observation, interviews, tests and documentation. Data analysis using quantitative analysis of descriptive statistics.

3. Results and Discussion

The results of this study are described in stages in the form of learning cycles carried out in the classroom teaching and learning process, namely.

Pre-cycle

Before conducting the research, the researchers first observed the mathematics teacher of class VIII-1 students at SMPN 1 Arjasa, namely Mr Aan Supandi, S.Pd. He said that the application of learning he did was still using the old way or using the lecture method after that giving assignments to do independently. From the results of his statement that the understanding of mathematics that occurs in class VIII-1 students is still relatively low, he also said that many students' cognitive scores have not reached the minimum completion criteria (KKM).

In cycle 1 there are six stages, namely the planning, implementation, observation, and reflection stages. In the planning stage, namely: 1) making lesson plans (RPP). 2) prepare tools, materials and learning materials. 3) prepare student activity observation sheets. 4) open class observation.

5) collaborate with other teachers to observe the activities of students and model teachers during the learning process. 6) explain to the observer about the learning approach that will be used during the lesson.

Based on the results of student observations in cycle I can be seen in the following figure:

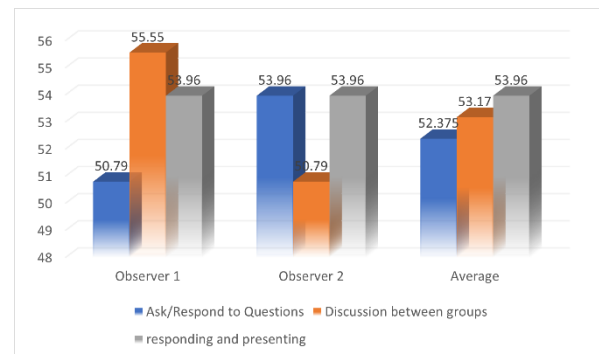


Figure 2. Results of Observation of Student Activity in Cycle 1

From the results obtained from observer 1 and observer 2, student activities carried out in cycle I include three activities, with each acquisition stating that the activities carried out by students are not optimal because the value obtained has not reached the desired provisions, this can be seen through the results of the acquisition of each activity as follows: (1) asking and responding to questions (52.37%), (2) discussion between groups (53.17%), (3) responding to and presenting individual and group work (53.96%).

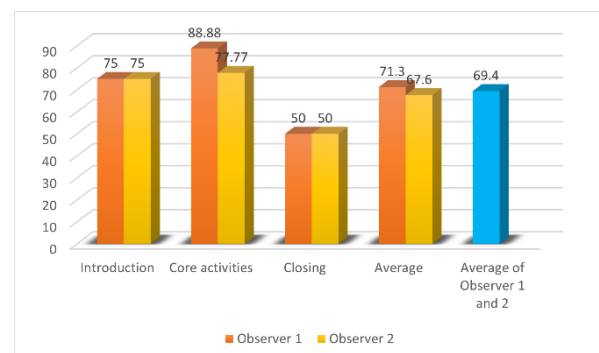


Figure 3. Open Class Observation Results Cycle I

In the open class observation there are 15 questions which have been adjusted to the lesson plan with details including: 4 in introductory activities, 9 in core activities, and 2 in closing activities based on the results of the open class observations above, the average is obtained, 69.4 so that the data obtained has not met the specified target.

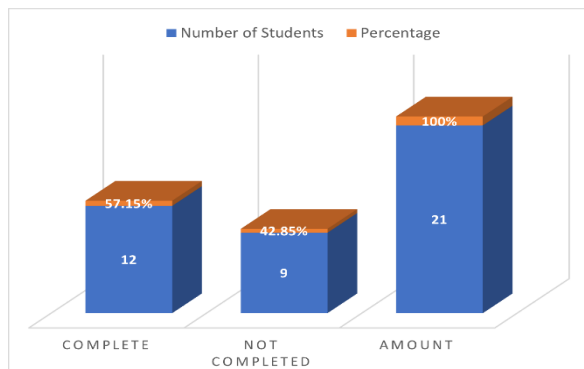


Figure 4. Cycle I Question Test Results

Based on the results of the recapitulation of the test results of students' understanding questions in cycle I, it is known that there were 12 students who completed the test with a percentage of 57.15% and 9 students who did not complete the test with a percentage of 42.85%. Thus the scores obtained by students in the cycle I test have not yet reached the target set.

After reflection, there are several factors that need to be improved in the implementation of cycle I learning including: 1) the limited time available so that many students do not complete the problem completely, 2) the activities carried out by students are not in accordance with the indicators to be achieved such as the lack of student response when asked by the teacher, 3) also in groups only a few students are active in following the discussion, 4) the teacher in delivering material to students is too fast and during learning the teacher is less in accompanying student learning activities. Based on the observation and test results obtained in cycle I, the researcher made the decision to continue cycle I learning to cycle II learning.

Cycle II is a follow-up to cycle I which is based on the results of the researcher's

reflection on the learning process. As was done in cycle I, cycle II consists of planning, action implementation, observation and reflection. In the planning stage, namely: 1) making lesson plans (RPP), 2) preparing, 2) preparing tools, materials and learning materials. 3) prepare student activity observation sheets. 4) open class observation. 5) collaborate with other teachers to observe the activities of students and model teachers during the learning process. The implementation stage in cycle II has been carried out well in accordance with the lesson preparation design (RPP). Based on the results of student activity observations, open class observations and comprehension results in cycle I can be seen in the following figure:

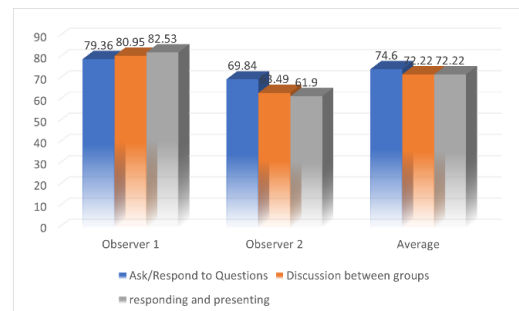


Figure 5. Hasil Observasi aktivitas Siswa pada Siklus II

Based on the results of the acquisition of student activity scores in cycle II, it is very visible that there is an increase from cycle I. This can be seen from the activities of students who have been active in following the learning stages, it is also seen based on the acquisition of values from three student activities such as: 1) asking or responding to questions (74.6%), 2) discussion between groups (72.22%), 3) responding and presenting individual or group work (72.22%).

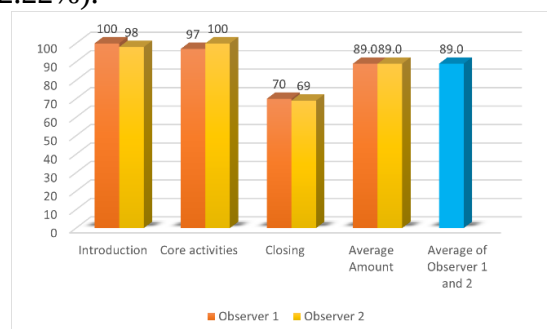


Figure 6. Results of Open Class Observation Cycle II

Open class observations carried out in cycle II have increased from 69.4 (cycle I) to 89 (cycle II).

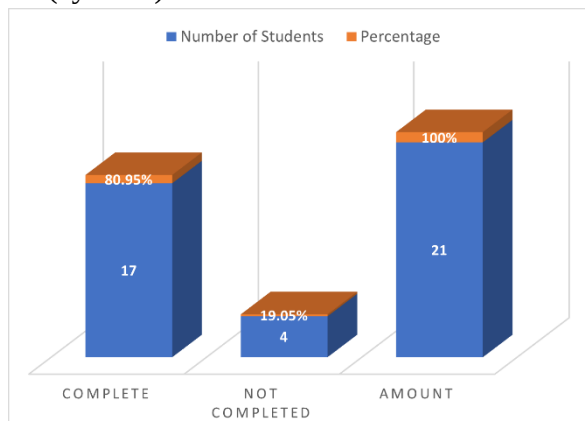


Figure 7. Cycle II test results

From the recapitulation of the results of the cycle II test, it shows the acquisition of scores in cycle II, 17 students who completed the test with a percentage of 80.95% and those who did not complete were 4 students with a percentage of 19.05%. Thus the test results of cycle I and cycle II questions have increased.

4. Conclusions

Based on the results of the application of learning in each cycle, it can be said that the application of the Realistic Mathematic Education (RME) approach based on Lesson Study for Learning Community (LSLC) can improve students' understanding of mathematics, it can be seen from the results of student activity and open class which increased each cycle. In student activity I increased from 52.37 to 74.6, the results of activity II increased from 53.17 to 72.22, in activity III increased from 53.96 to 72.22. On the results of the application of the Realistic Mathematic Education (RME) Based Lesson Study For Learning Community (LSLC) approach can be said to be in accordance with the expectations and plans that researchers designed earlier. it can also be seen from the test results that increase each cycle, namely: in cycle I, 12 students completed with a

percentage of (57.15%) increased to 19 students who completed with a percentage of (89%).

5. References

- Atikurrahman, M., Hobri, & Yulianti, N. (2019). The development of comparison material tool with problem based learning based on caring community and its effect on the students' connection ability. *Journal of Physics: Conference Series*, 1211(1). <https://doi.org/10.1088/1742-6596/1211/1/012091>
- Fahrudhin, A. G., & Zuliana, E. (2018). *REALISTIC MATHEMATIC EDUCATION BERBANTU ALAT PERAGA BONGPAS*. 1(1).
- Fauzi, A. (2019). *UPAYA MENINGKATKAN PEMAHAMAN MATEMATIS SISWA PADA OPERASI HITUNG BILANGAN BULAT MELALUI MODEL REALISTIC MATHEMATICA EDUCATIONS (RME)*. 678–697.
- Hobri. (2016). *LESSON STUDY FOR LEARNING COMMUNITY : REVIEW HASIL SHORT TERM ON LESSON STUDY V DI JEPANG*.
- Khairunnisa, A., Gozali, S. M., & Juandi, D. (2022). *Systematic Literature Review : Kemampuan Pemahaman Matematis Siswa dalam Menyelesaikan Masalah Matematika*. 06(02), 1846–1856.
- Matematis, K. P., & Council, N. (2019). *PENERAPAN LEMBAR KERJA SISWA (LKS) BERBASIS REALISTIC MATHEMATICS EDUCATION (RME) TERHADAP KEMAMPUAN PENALARAN MATEMATIS SISWA Hasnaa Indar N Program Studi Pendidikan Matematika , Fakultas Keguruan dan Ilmu Pendidikan , Universitas Muhammadiyah Sukabumi*. 2(2), 27–33.
- Penelitian, S., & Cisirupankelas, N. (2013). *KEMAMPUAN PEMAHAMAN MATEMATIS SISWA MELALUI MODEL PEMBELAJARAN AUDITORY INTELLECTUALY REPETITION DAN PROBLEM BASED LEARNING*.

- Posman Rambe, & Nurwahidah. (2023). The Impact of Problem-Based Learning Learning Methods on the Development of Islamic Education Learning. *JOINME (Journal of Insan Mulia Education)*, 1(1), 25–30.
<https://doi.org/10.59923/joinme.v1i1.9>
- Rohman, S. (n.d.). *Students metacognition analysis through jumping task based on lesson study for learning community*.
- Sari, A., & Yuniati, S. (2018). *PENERAPAN PENDEKATAN REALISTIC MATHEMATICS EDUCATION (RME) TERHADAP KEMAMPUAN PEMAHAMAN*. 2(2), 71–80.
- Soepriyanti, H., Sujana, I. M., Thohir, L., & Syahrial, E. (2022). *Peningkatan Kualitas Pembelajaran Guru Bahasa Inggris MTs Sabilurrrasyad NW Barabali Lombok Tengah Melalui Lesson Study For Community Learning (LSLC)*.
- Tanu, T., Neng, W., Septiani, S., Indah, D., & Fauziah, R. (2018). *Analisis Kemampuan Pemahaman Matematis Siswa Kelas IX Pada Materi Bangun Ruang*. 6(1), 19–28.
- Yanti, F., Nurva, M. S., & Fikriani, T. (2022). *EDUKATIF : JURNAL ILMU PENDIDIKAN Pengembangan Lembar Kerja Peserta Didik (LKPD) Berbasis Realistic Mathematic Education (RME) untuk Meningkatkan Kemampuan Penalaran Matematis Peserta Didik*. 4(2), 1743–1751.