

IMPLEMENTATION OF INDONESIAN MATHEMATICS REALISTIC APPROACH (PMRI) MATERIALS OF MATHEMATICS FRANCE CONCEPTS FOR CLASS VI SDN II STUDENTS WATESWINANGUN, SAMBENG-LAMONGAN.

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Abstract

This study aims to (1) determine the effect of using Indonesian Realistic Mathematics Education (PMRI) in learning mathematics on fraction materials, (2) determine the positive influence of Indonesian Realistic Mathematics Education (PMRI) on understanding the concept of fractions, (3) determine the effect of Indonesian Realistic Mathematics Education (PMRI) on students' critical and logical thinking. PMRI is a mathematics learning method that links real things as students' experiences, so that the concept material for mathematical fractions which is usually emphasized by rote becomes learning understanding while observing real objects around them as objects, and makes students not focus on something that is just imagined. The population of this research was class VI students at SDN II Wateswianangun by taking 4 samples from 16 research students. The instruments used were tests of understanding concepts and critical thinking on fractional concepts and interview tests. The research used is descriptive qualitative research.

Keywords: Learning mathematics, PMRI, Fractions, understanding of concepts, realistic mathematics

INTRODUCTION

Mathematics is a basic science that underlies the development of other sciences. Therefore mathematics is one of the important subjects taught in schools and is useful in everyday life. In general, the purpose of learning mathematics is to form students' reasoning abilities that are measurable in thinking critically, logically, creatively, innovatively, problem solving and be objective. As a basic science in studying mathematics, especially at the elementary school level, it is necessary to understand the psychological condition of students, who on average are still at the stage of concrete thinking, so they need to understand something abstract. According to Piaget, at this stage students can think logically about concrete objects, learn to remember and communicate. With the experience gained students can classify, communicate concepts in mathematics. Therefore, through real experience students can sharpen their mastery of concepts and reasoning power in solving mathematical problems in everyday life.

The ability to think logically and rationally is a necessary thinking ability developed to optimize the development of the left brain which is very necessary to solve mathematical problems in everyday

life. The ability to think logically can also be interpreted as the ability to think of students to draw valid conclusions according to logic.

Understanding of concepts and ability to think logically requires knowledge from experience by the students themselves. Therefore, the teacher's role and efforts are needed to motivate, train and explore all the abilities and knowledge of students. But in essence, knowledge and abilities are not only the result of the transfer of knowledge from one person to another, but can be formed by students themselves through real experience by associating the knowledge they already have. In learning mathematics at school, of course, it must also strengthen the experience of students, so that inevitably they have to involve active students. In this way there is effective two-way communication between students and teachers, which will have an impact on the development of mathematical experiences and skills such as logical, creative thinking and problem solving.

One approach that requires teacher innovation and creativity to involve the active role of students is Indonesian Realistic Mathematics Education (PMRI). In PMRI learning this is done by linking

real things as student experiences. This learning approach is very suitable to be applied in learning mathematics, because in learning mathematics it is not enough just to know and memorize, but also requires an understanding and ability to solve mathematical problems properly and correctly through activities or real objects in everyday life as student experiences. PMRI is a learning activity that relates to the real life of students in their daily activities which has a basic philosophy, namely meaningful learning and constructivism.

In this lesson, students associate old knowledge with understanding a mathematical concept so that students build their own understanding and understanding. The characteristics of PMRI learning according to Supinah (2008, p.16), are as follows: (1) using contextual problems, (2) using models, (3) using students' own results and constructs, (4) focusing on students, and (5) there is interaction between teachers and students. By using models and contexts, students can go through the mathematization process and develop it within themselves. Thus, the essence of learning mathematics is being able to use it to solve everyday problems.

Meanwhile, according to Freudenthal (2013, p.60), 'Students must be given the opportunity to experience the same process in mathematical concepts'. This means that the learning process must be carried out with activities that allow students to carry out processes where they can find their mathematical concepts. Thus understanding mathematics must be learned by students from things that are easily understood and known by students, so that mathematics is presented not only as "finished" and "instant" goods that can be transferred by teachers to students in mind quickly but obtained through a process. think students. Likewise with understanding the concept of mathematical fractions.

Fractions are one of the most difficult materials for some students (Siegler et al.,

2010). Teachers are also aware of this. Lack of understanding of the concept of fractions is an important point of dissatisfaction with knowledge of mathematics (Siegler et al., 2010). In pursuing fractional material, teachers more often ask students to memorize and use formulas than to develop students' understanding (A. Fitriani et al., 2019). Ready and Duru expressed the same thing where the main reason behind the students' lack of understanding was that they only tended to remember formulas, algorithms, problem solving and students only assumed that the denominator and numerator of fractions were two separate integers (Deringol, 2019). Even though students' understanding will be needed for the future not only to develop mathematical understanding but also to support students in everyday life (A. Fitriani et al., 2019).

LITERATURE REVIEW

In this article using quantitative descriptive research. Descriptive research is research conducted to describe certain symptoms, phenomena or events. Data collection is carried out to obtain information related to the phenomenon of certain conditions or variables and is not intended to test hypotheses. This descriptive research includes the presentation of conclusions through exposure. The main purpose of the analysis is to provide illustrations and summaries that can help readers understand the types of variables and their interrelationships (Takshakkori & Teddlie, 2010: 186). Quantitative research methods (Sugiyono, 2016: 8), namely research that examines certain populations or samples, data collection uses research instruments, data analysis is quantitative/statistical in nature, with the aim of testing the established hypotheses. This research was conducted using a survey on grade 6 students at SDN II Wateswinangun with competencies regarding understanding the concept of mathematical fractions in the form of descriptive competencies that have been learned by students at SDN II Wateswinangun.

This research is a survey research conducted to identify students' knowledge of SDN II Wateswinangun regarding the concept of mathematical fractions to serve as input for the development of the implementation of PMRI (Indonesian Realistic Mathematics Education) in education. This research was carried out on November 11, 2022 at the house of a female student at SDN II Wateswinangun with a pre-agreed schedule.

The population is a generalization area consisting of objects/subjects that have certain qualities and characteristics that are applied by researchers to be studied and then conclusions drawn (Sugiyono, 2016: 117). While the sample is part or representative of the population studied. If we are only going to examine a portion of the population, then the research is called sample research. The population of this study were grade 6 students at SDN II Wateswinangun. Based on class data, the total number of grade 6 students at SDN II Wateswinangun is 16, with details of 8 boys and 8 girls. So for the sample, the researcher took 4 students with details of 1 male and 3 female. This was chosen with the provisions of quantitative research techniques, namely probability sampling, a random sampling method.

In accordance with the required data, the data collection technique uses a questionnaire technique (questionnaire). The questionnaire method has two types, namely open and closed, but for this study using an open research method. The open questionnaire method means that the researcher gives the opportunity for respondents to answer with their own knowledge without being constrained or limited by the researcher. In its implementation, questionnaires were given to students who had been selected as samples to fill out the questions that had been provided by the researcher. Instrument validation test is carried out by content validation based on competence or expert judgment. The research instrument is a tool used to measure observed social and tool phenomena, so it can be said that the

instrument is a measuring tool in research (Sugiyono, 2016: 148). The instrument used in this study was in the form of Student Worksheets (LKPD) which contained materials and questions regarding the concept of mathematical fractions.

RESULTS AND DISCUSSION

The focus of implementing PMRI learning is to increase understanding of mathematical concepts by linking real life to everyday life, as well as constructing students' experiences. The goal set is to improve students' critical thinking skills regarding the concept of mathematical fractions through everyday life. The results of this study are guided by data from interviews, observations and documentation presented in tabular form to make it easier to understand. This study uses a descriptive basic interpretation in the form of the following sentence descriptions:

A. Students' Understanding of the Concept of Fractions with PMRI

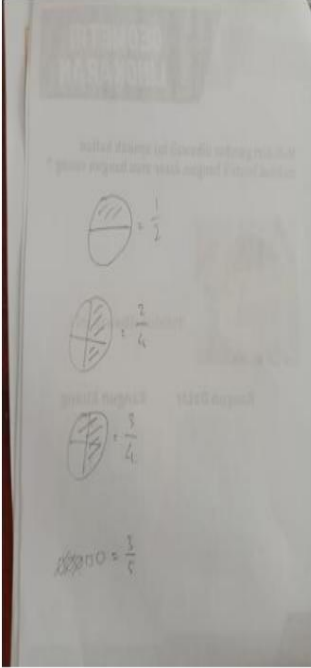
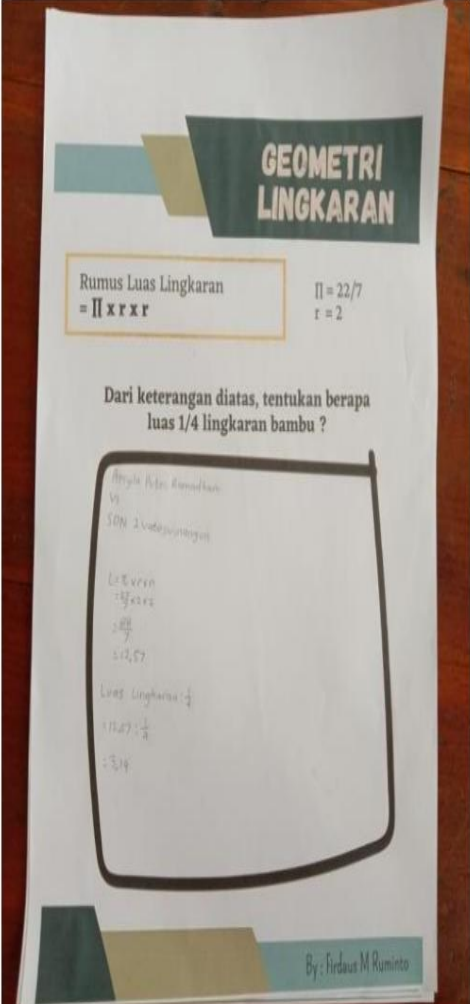
This section will explain the results of research in the field, namely students of class VI, SDN II Wateswinangun. The interview results will be supported by observations made on November 10, 2022 at the researcher's house. Beginning with the researcher asking, 'Have you ever seen this thing?'. Students according to their experience, some know and some don't. Then proceed by asking 'Which structure can be seen from that object?' students give various answers according to their respective opinions, some are circles, balls, circles, etc. Then, the researcher continued to provide more detailed questions to enter the concept of fractions of an object. So that students understand the concept of fractions and can explain the difference between the numerator and denominator.

B. Implementation of Fractional Concepts with PMRI.

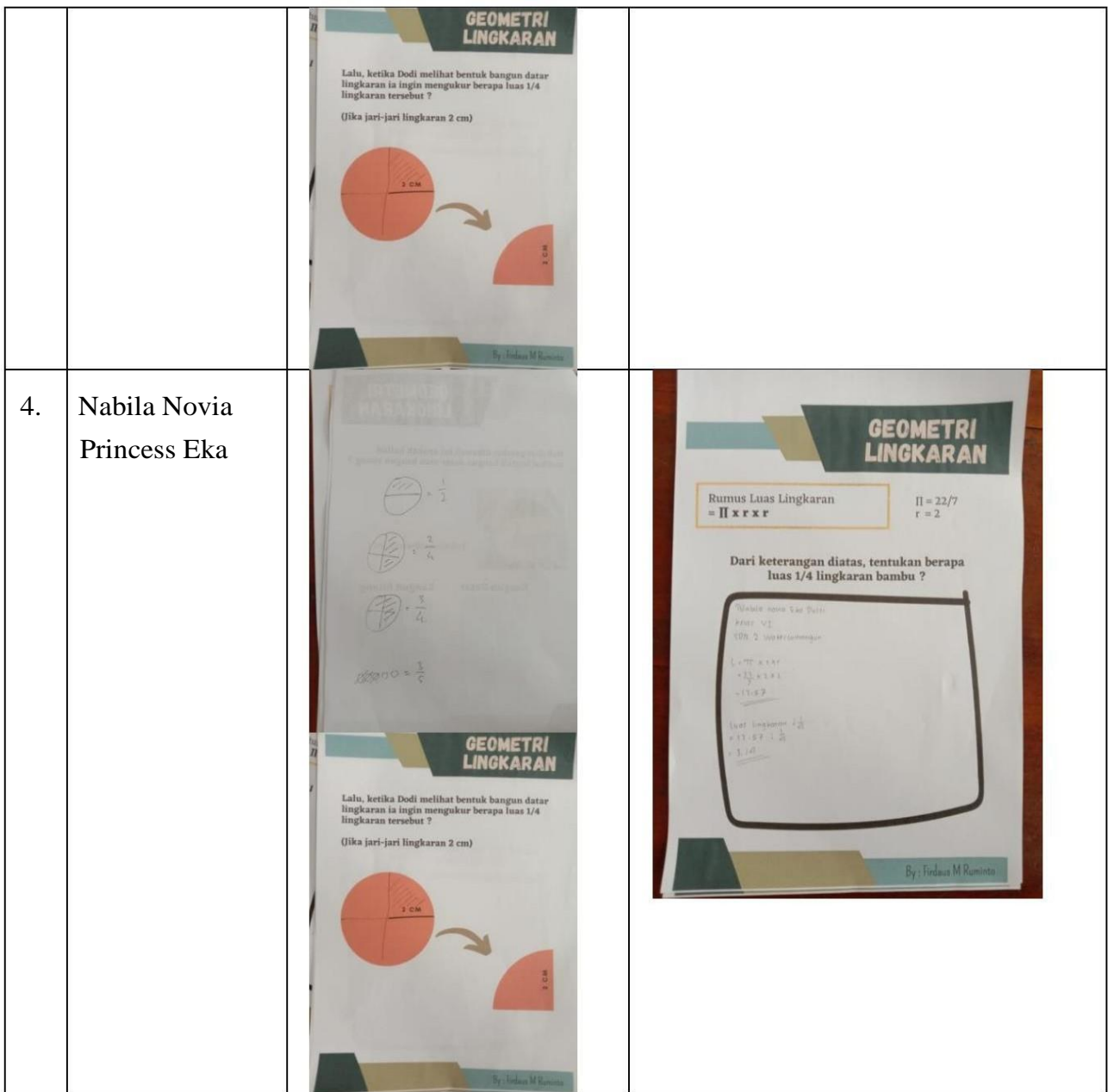
The researcher distributed student

worksheets to each child and asked to be given an identity on the worksheet. Then, the researcher explained about the procedure for filling out the worksheet. In the worksheet students are asked to make pictures of fractional numbers and given an the discussion:

explanation why that is so. Then for further students are asked to calculate the area of the fraction of the whole shape. Working on this worksheet aims to determine the understanding of students. Following are the results of

No	Name	Understanding the Concept of Fractions	Implementation results
1	Arsyila Putri Ramadhani	 <p>The image shows a student's handwritten work on a worksheet. It features three circles. The first circle is divided into two equal halves, with the fraction $\frac{1}{2}$ written next to it. The second circle is divided into four equal quadrants, with the fraction $\frac{3}{4}$ written next to it. The third circle is divided into four equal quadrants, with the fraction $\frac{5}{4}$ written next to it. Below these circles, there is a calculation: $1000 = \frac{3}{4}$.</p>	 <p>The image shows a student's handwritten work on a worksheet titled "GEOMETRI LINGKARAN". It includes the formula for the area of a circle: $\text{Rumus Luas Lingkaran} = \pi \times r \times r$. To the right, it states $\pi = 22/7$ and $r = 2$. Below this, a question asks: "Dari keterangan diatas, tentukan berapa luas 1/4 lingkaran bambu?". The student has written a calculation: $\text{Luas lingkaran} = \frac{1}{4} \times 22/7 \times 2 \times 2 = 3,14$. At the bottom right, it says "By: Firdaus M Raminto".</p>

2.	Princess Karisha Sri Lestari		
3.	Muhammad Nursyam Ardiansyah		



C. Follow-Up Implementation of the concept of fractions with PMRI

Based on interviews, observations and documentation of students, it can be obtained that the

implementation of PMRI is well implemented, this can be seen from the results of interviews between researchers and students. As follows :

No	Name	Interview Results
1	Arsyila Putri Ramadhani	“Today I like to learn mathematics In a new way, this smethod is easy For us to understand because it Uses examples from objects around us”
2.	Karisha Putri Silestari	“I am very happy today, I got a New experience, namely learning Fractional material in a new way”

3	Mochammad Nursyam	"It's delicious, the lesson given is fun, and it's not confusing because of the
4	Nabila Novia Eka	"Yeah, today was really fun learning, I learned math fractions using examples that I can easily understand, so we don't have anv

CONCLUSIONS

The conclusion obtained from the results of this study is that the implementation of Indonesian Realistic Mathematics Education (PMRI)-based learning can increase students' knowledge and understanding of 21st century learning at SDN II Wateswinangun, Sambeng, Lamongan. This is evident from the results of the implementation of the concept of mathematical fractions, where students are required to link the knowledge and experiences of students in everyday life. In addition, this learning can be carried out by learning while observing the objects around them as objects, which makes students not focus on something that is just imagined. This is proven, when students can use round glass which is actualized into a circular flat object. Thus, they will learn to use objects directly without wishful thinking.

Based on the implementation of Indonesian Realistic Mathematics Education (PMRI)-based learning that has been carried out at SDN II Wateswinangun, Sambeng, Lamongan. So the researchers made

several suggestions to the teaching staff to maximize the implementation of Indonesian Realistic Mathematics Education (PMRI)-based learning for students. Because in its implementation, researchers found several perspectives and understandings of students that were different from before. For example, students used to think that fractions were two separate numbers between the numerator and denominator, but after learning to use the Indonesian Realistic Mathematics Education (PMRI) method, students understood and understood that fractions are a whole unit that is divided into fractions and written in the form fraction number. And also in PMRI learning students are required to actualize their experience and knowledge so that one day if they are met with math problems in everyday life, students can easily solve them. This is very suitable to be implemented in 21st century learning.

I would like to thank my family, friends and people who have helped in the preparation of this article. Hopefully what has been written here can be useful for others in the future.

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