

# Students Worksheet Design On Geometry For Seventh Grade Students With Rme Approach

Padhila Angraini, Suparman

**Abstract:** The purpose of this study was to design teaching materials in learning geometry based on RME to improve students' understanding of concepts. This study uses the Research and Development (R & D) method with the ADDIE model. The procedure in the ADDIE model consists of five stages, namely Analysis, Design, Development, Implementation, and Evaluation. This research is limited to analysis and design only. The subjects in this study were several samples of seventh grade students in junior high school. Data collection techniques are observation and interview. The instruments of data collection include observation guidelines and interview guidelines. The results of this study indicate that the design of teaching material has been adjusted to the characteristics of students and the 2013 curriculum. Teaching materials in learning geometry based on RME to improve students' understanding of concepts. This research can be continued in the stages of development, implementation and evaluation in learning.

**Index Terms:** Design, RME, Geometry, Worksheet

## 1. INTRODUCTION

HOTS (High Order Thinking Skill) is a skill in the thinking process that links the level of positivity in analyzing, evaluating, and making levels [1-3]. In line with that, [3] suggests principles that can help teachers to grow HOTS in mathematics learning such as implementing how to assess optimal learning, determining HOTS learning outcomes, HOTS question strategies, integrating information, communication, and technology, teaching activities and development of cognitive abilities. Also, in the formulation of HOTS learning objectives using the revised Bloom taxonomy to improve students' cognitive skills [1]. So, in HOTS learning is learning that relates to how to analyze, evaluate, and create levels, wherein the development of learning HOTS uses revised taxonomy of bloom to improve cognitive abilities, to integrate information, communication, and technology. [4] suggests that students experience difficulties in solving problems related to HOTS questions that require students to think high, especially in geometry. This is supported by [5-7] which states that students also experience difficulties in problem-solving, while students already know the formula on geometry, but students find it difficult to solve problems when they do not understand representations in two dimensions or three dimensions because of the different spatial abilities of students. In addition, Geometry is related to everyday life events with concepts in mathematics and its learning does not have to be based on two-dimensional forms [6], [8-9] Therefore, students' difficulties in geometry in daily life -day on problem-solving and representing object on two dimensions or three dimensions, behind that students already know the formula in geometry, difficulties occur in the questions that are HOTS thinking processes. RME is the first mathematics learning approach born in the Netherlands, in addition to designing RME-based learning, an educator must pay attention to the main principles that exist in the RME to achieve the desired goals [10]. The RME approach makes understanding students' mathematical concepts through their informal knowledge so that students

can actively accept mathematics no longer seen as passive recipients of mathematics [11]. [12] suggests that the RME approach can transform mathematics learning into meaningful and enjoyable learning using the context of everyday life which converted into mathematical problems. Therefore the RME approach is learning that is born with the main principles to achieve meaningful and enjoyable learning goals so that students receive good mathematics learning. Therefore, as an innovation in mathematics learning as well as an implementation of the 2013 curriculum that is oriented to the relevance of mathematics to the conditions of the reality of everyday life. Based on this, the researcher intends to make teaching materials in learning geometry. The purpose of this study was to design teaching materials in learning geometry with the RME approach. This research can be continued in the implementation and evaluation stages

## 2 METHOD

This research method uses the ADDIE model. The ADDIE model consists of five stages, namely analysis, design, development, implementation, and evaluation [13-15]. The product in this study is the design of teaching materials to improve understanding of mathematical concepts. The analysis phase in this study consisted of performance analysis and needs analysis. Performance analysis is done through observation of the mathematics learning process and student learning outcomes, as well as interviews with mathematics teachers. The results of the performance analysis will be used to obtain a needs analysis. Needs study is done by determining the subject matter of mathematics be included in teaching materials, such as deciding KD (Basic Competence) and Basic Competence targets and choosing the design of teaching materials that will be used to make teaching materials. Furthermore, the design stage in this study was carried out through the framework preparation activities in teaching materials and the design of teaching materials. Experts will validate products in the form of teaching material designs. Design validation was carried out to determine the expert's assessment and input as a revision material so that the model of the development of teaching materials was of good quality. The subjects in this study were seventh-grade students of SMP Negeri 2 Pundong 2019/2020 academic year. The instruments of data collection include guidelines for observation and interviews.

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### 3 RESULT AND DISCUSSION

#### 3.1 Performance Analysis

The results of the observation of the learning process of mathematics and student learning outcomes obtain some information. First, the teacher has carried out the learning process according to the stages of the teaching and learning process, which includes: introduction, apperception, material delivery, evaluation, and closing. Second, students have difficulties when given contextual questions in daily life. Third, the lack of understanding of students' concepts of flat building material. The results of the interviews with the teacher obtained some information. First, the teacher only uses the lecture method in explaining the material. Second, the media used by teachers has printed books. Third, the lack of teaching materials in the form of mathematics students worksheet at the school. The performance analysis, the researcher concludes that students and teachers need teaching materials in the form of students worksheet to help and facilitate mathematics learning activities to improve understanding of concepts in students so that learning can take place effectively and efficiently.

#### 3.2 Needs Analysis

[16] suggesting that three errors in geometry, first student errors in using geometric formulas, both errors identify the properties of the planar geometry, and all three errors in interpreting story problems become mathematical forms. Also, in learning students still have difficulty in solving problems in the form of stories and learning resources that are used are still in the way of worksheets that contain material, formulas, contemplate problems and solutions and practice in the form of problems [17-18]. Therefore, based on the explanation above, it is essential for learning devices in the form of student worksheets using the RME approach that will bring students in building students' knowledge through problems that exist in everyday life

#### 3.3 Design Stage

Teaching materials used are teaching materials for student worksheets. Furthermore, the Students worksheet contains cover, preface, table of contents, instructions for using Students worksheets, Students worksheet syllabus, student worksheets, and student activities. Therefore the Students worksheet cover design can be seen in Figure 1.



Fig. 1. Design Cover

Figure 1 contains the title of the Students worksheet which also includes classes and semesters that students will use. In addition, for the introductory word about the author's thank you

to the parties involved and the table of contents contains the sequence on the Students worksheet and the page on the Students worksheet. This can be seen in Figure 2.

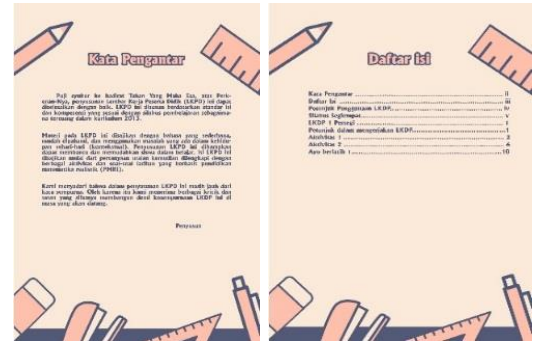


Fig. 2. Preface and Table of Contents

Furthermore, the instructions for using the Students worksheet contain syllabus components as a basic guideline for the determination of learning strategies used to achieve learning goals, instructions for working on the Students worksheet, activities, let's practice, and post test questions. This can be seen in Figure 3.



Fig. 3. irections for Using Students worksheet

At Students worksheet there is also an Students worksheet Syllabus which contains core competencies, basic competencies, and indicators of achievement of competencies. This can be seen in Figure 4.



Fig. 4. Students worksheet Syllabus

So, this Students worksheet has student worksheets and activities that will be used for students answering a series of questions. The question used here is based on RME, one example is in the context of the paddy fields used to study flat-

build material [19]. This can be seen in Figure 5.

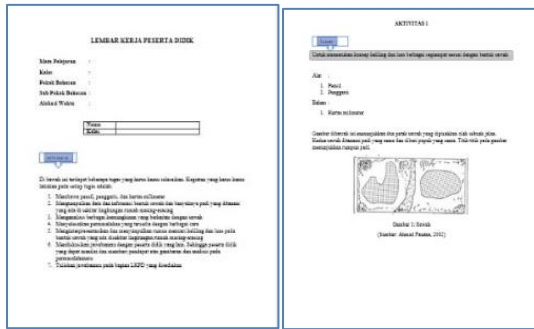


Fig. 5. Student Worksheet and Activities [19]

This teaching material has been assessed for its feasibility by two mathematics teachers. Assessment is done by filling out the design validation sheet that was made by the researcher. The grid of instrument design validation sheets can be seen in Table 1.

TABLE 1  
Design Instrument Grid

No	Indicator
1	Fill in the teaching material
2	PMR Steps
3	Stages of Concept Understanding

The assessment on the design validation sheet obtained a score on the feasibility of the design of learning teaching materials. Scoring results can be seen in Table 2

TABLE 2  
Design Assessment Results

No	Validator	Score	Category
1	Eddy Supriyadi, S.Pd	29	Good
2	Oktavia Filda Yanti, S.Pd	23	Enough
	Total Score	52	-
	Average score	26	Enough

Table 2 shows that the feasibility of the design of instructional materials gets enough categories. The design of teaching materials was declared feasible with revisions in accordance with the comments and suggestions given by the validator. The results of the revised design of teaching materials can be seen in Table 3.

TABLE 3  
Comments and Suggestions

No	Comments	Suggestions
1	On the instructions page, the font for the sub instructions is unclear, shaded (has a shadow)	better fonts are replaced more clearly so they are easy to read
2	Already fulfilling the steps of PMR but only implied are not express or written clearly	-
3	Activities at the LKPD have been designed in accordance with the indicators of understanding the concept, are quite good	-

As demonstrated in this document, the numbering for sections upper case Arabic numerals, then upper case Arabic numerals, separated by periods. Initial paragraphs after the section title are not indented. Only the initial, introductory paragraph has a drop cap.

#### 4 CONCLUSION

This research resulted in the design of teaching materials for mathematics learning in geometry material with the PMR approach to improve students' understanding of concepts. The Students worksheet design consists of 7 main components such as cover, preface, table of contents, instructions for using Students worksheet, Students worksheet of syllabus, student worksheets, and activities. The design of the results of this study has the potential to improve students' understanding of concepts on the subject of flat building. Based on the results of the validation, it can be concluded that the teaching material design is said to be appropriate as a guideline for making teaching materials on geometry material with the RME approach.

#### 5 END SECTION

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