DEVELOPMENT OF PROPORTION MATERIAL MATHEMATICS MODULE FOR CLASS VII SMP / MTs STUDENTS BASED ON CURRICULUM 2013

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ABSTRACT

Limited teaching material is one of the problems that affect the achievement of learning goals. Teaching materials that can help students learn independently are modules. This study is a development study to produce mathematics teaching materials on comparison for class VII students of Junior High School (SMP / MTs) based on the 2013 curriculum and determine the quality of the developed modules suitable for mathematics learning. This study uses the developed Research and Development (R & D) model, including identifying potential and problems, gathering information, designing products, validating product designs, revising product design, product testing stages, and product revisions. The subject of this module's study and development are material experts, media experts, and students. The 2013 curriculum-based mathematics module is developed based on five main learning experiences: observing, asking questions, gathering information, associating, and communicating. The study results indicate that the mathematics teaching material for comparisons for class VII students of SMP / MTs based on the 2013 curriculum has good quality. Based on the assessment by material experts obtained an average score of 116.67 that meets the criteria of good, by media experts received an average score of 112.33, which meets the requirements of interest, and the results of student responses to the module indicate that the quality of the module good With an average score of 116.5. Based on the study results, the mathematics module of comparison material based on the 2013 curriculum is appropriate for mathematics learning.
Keywords: Modul, Proportion, curriculum 2013

INTRODUCTION

One of the things that reflects the quality and quality of human resources in Education. Education makes humans develop their potential to have the abilities and skills needed by themselves, society, nation, and country. Based on the Law of the Republic of Indonesia number 20 of 2003 article 1, paragraph 1 concerning the national education system, Education is a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to have religious-spiritual strength, self-control, personality, intelligence, noble character, and skills needed by himself, society, nation, and state. Therefore, Education must be designed to understand and improve critical thinking, creativity, and innovation.

Learning resources are one important component of learning. One source of knowledge is teaching material. According to the Ministry of National Education (2008: 6), Teaching materials are all forms of material used to assist teachers/instructors in carrying out teaching and learning activities. The material in question can be either written material or unwritten material. The types of teaching materials usually used in learning include books, student activity sheets, and modules. The module is one of the written teaching materials used in the learning process. The module contains materials that students can study independently and includes exercises related to the material and packaged excitingly and systematically. The module's function is as a sequence to train students' independence in understanding learning material. The content or presentation material of a module must be presented in full and discussed through the presentations to feel they understand enough about the particular field of study from the module's learning outcomes.

Mathematics is one branch of science about a mindset, an art, a symbolic language, and a tool that has a very broad and abstract scope of objects so that it can cause logical and directed thoughts that are divided into three fields, namely algebra, analysis, and geometry. In this research, what is meant by

mathematics is about school mathematics. According to Suherman et al. (2003: 55), school mathematics is as follows. School mathematics is taught in schools, namely mathematics taught in Primary Education (SD and SLTP) and Secondary Education (SLTA). It was explained that school mathematics consisted of selected mathematics parts to develop abilities and form personal and guided in developing science and technology.

Suherman et al. (2003: 56) also mentioned that the function of mathematics as a tool, mindset, and science. These three functions should be used as a reference in learning mathematics in school. Based on school mathematics's understanding and function, it can be concluded that school mathematics has essential characteristics, namely having abstract objects and having a deductive mindset (can produce conclusions) and being consistent (fixed). In the system of teaching and learning process serves to achieve educational goals. School mathematics aims to prepare students to deal with changing world conditions that are always developing and use mathematics in everyday life. According to Slameto (2010: 2), learning is a business process carried out by a person to obtain a new change in behavior as a whole, as a result of his own experience in his interaction with his environment. The intended material can be either written or unwritten material. Based on the description above, it can be concluded that, Thus, learning is a business process carried out by someone to obtain a change in behavior. For example, a student learns to make changes in him from not being able to, from not knowing to know, according to the Ministry of National Education Directorate General of Primary and Secondary Education Management Directorate of High School Development in Guidelines for Development of Teaching Materials. A module is a book written with the aim that students can study independently without or with the guidance of the teacher. According to Daryanto (2013: 9-11), a good module has the following characteristics si Self-instruction and Self Contained. While the objectives of developing the module development stages according to the Ministry of National Education (2008: 20-23) are: 1) Analysis of Core Competencies and Basic Competencies. 2) Determine module titles. 3) Providing module ode. 4) Writing modules

So the module is a printed teaching material, a complete unit that stands alone and consists of a series of learning activities. Modules can be used as a tool in the learning process to stimulate student's minds to solve existing problems more independently, where the teacher only provides minimal assistance in guiding. Based on interviews with mathematics teachers at SMP Muhamadiyah Pleret and SMP 4 Patuk. SMP Muhammadiyah Pleret obtained information that in learning mathematics teaching material used in student activity sheets. The school has also provided mathematics books. However, the provision of books for grade VII students in mathematics is still minimal. At the same time, SMP Negeri 4 Patuk has obtained information that mathematics learning and some teaching materials used are in the form of mathematics books. The provision of mathematics books for grade VII students is still limited because two students only get one math book.

Based on this background, the following problems can be formulated: 1) How to develop a mathematical module on comparison material for grade VII students of SMP / MTs based on the 2013 curriculum? 2) How is the feasibility of Proportion material mathematics modules for grade VII students of SMP / MTs based on the 2013 curriculum?

METHODS

This research uses a research model called Research and Development. Sugiyono (2014: 407) states that Research and Development is a research method used to produce specific products and test their effectiveness. This research is focused on the Development of Proportion Material Mathematics Modules for Class VII Students. The procedure of developing this research refers to Sugiyono's development model. The steps of research development are as follows.

1. Potential and Problems. Their potential is that the school has a student book used in the classroom's learning process. The problem is having students' difficulty understanding the material with books provided by the school when students are learning.
2. Data Collection. After the problem can be demonstrated factually, it is then necessary to gather various information that can be used as material for planning certain products expected to solve the

problem. After the potential and problems have been discovered, the next stage of data collection is to strengthen the first stage's curriculum analysis phase.

3. Product Design. Results The final results of research and development activities are in the form of new product designs, complete with specifications. Product designs must be embodied in drawings or charts to be used as a guide to assess and create them.

4. Design Validation. A process of activities to assess product design. Product validation can be done by presenting several experts or experts. Each expert is asked to determine the design so that further weaknesses and weaknesses can be identified. Validation is adjusted to the evaluation. The evaluation in question is by the evaluation component of the Ministry of National Education.

5. Design Revision. After the design has been validated by the expert and known for its shortcomings and weaknesses, the researchers who developed the product have corrected the validated product designs' flaws and imperfections.

6. Product Testing. Product trials are carried out to determine the suitability of the product being developed to actually run as expected. Through this activity, the researcher also collects information for product improvement. Product trials are conducted twice, namely in small classes and large classes.

7. Product Revision. Product revision aims to overcome the shortcomings and weaknesses of module products tested in the first trial with limited samples and improve the module to be more effective.

8. Product Results. Product results were not conducted in this study due to time, cost, and manpower constraints. The development of Proportion mathematics modules for grade VII students based on the 2013 curriculum, was limited to product revisions.

The study was conducted at SMP Muhammadiyah Pleret and SMP 4 Patuk. This study's subjects were class VII students in SMP Muhamadiyah Pleret with 20 students and SMP Negeri 4 Patuk with 20 students. Students provide assessments and suggestions for module improvement. The instrument used to collect data in this study was a questionnaire. The type of questionnaire used was the checklist questionnaire. There were 3 questionnaires developed: material expert assessment questionnaire, media expert evaluation questionnaire, and student response assessment questionnaire. The questionnaire was given at the evaluation stage, namely the validation and product trial activities. In the validation stage, the material expert assessment questionnaire is given to the material expert to provide an assessment and input on the module in terms of material, including several aspects, including the feasibility of the content, linguistic, presentation, and guided findings. The media expert evaluation questionnaire was given to media experts to provide an assessment and input on the module in terms of media, which included several aspects including the design aspects of appearance, fonts, layout, illustrations, graphics, images, and language. Whereas in the product trial, the student response assessment questionnaire was given to students after students studied the module. The data analysis technique used is the Likert scale presented in Table 1, which is as follows.

Table 1. Likert scale

Information	Score
Strongly agree (very good)	5
Agree (good)	4
Hesitation (enough)	3
Disagree (less suitable)	2
Strongly disagree (not suitable)	1

From the data collected, in Sukarjo (2006: 55), the average is calculated using the formula:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Information:
$\bar{x}$: average score
$\sum_{i=1}^{n} x_i$: total score

n: number of evaluators

Next, determine the average criteria in the guidelines for the ideal assessment criteria presented in Table 2.

Table 2. Criteria for Ideal Rating Categories

No	Range of scores (i) quantitative	Category
1.	$\bar{X} > (\overline{M_i} + 1{,}8\,SB_i)$	Very good
2.	$(\overline{M_i} + 0{,}6\,SB_i) < \bar{X} \leq (\overline{M_i} + 1{,}8\,SB_i)$	Well
3.	$(\overline{M_i} - 0{,}6\,SB_i) < \bar{X} \leq (\overline{M_i} + 0{,}6\,SB_i)$	Enough
4.	$(\overline{M_i} - 1{,}8\,SB_i) < \bar{X} \leq (\overline{M_i} - 0{,}6\,SB_i)$	Less
5.	$\bar{X} > (\overline{M_i} - 1{,}8\,SB_i)$	Very less

Information:

$\bar{X}$: average score

M_i: average ideal

SB_i: ideal standard deviation

RESULTS AND DISCUSSION

The trial data in developing the guided discovery-based mathematics module of trigonometry material covers potential and problems, data collection, product design, design validation, design revision, product trial, and product revision. Based on the data analysis technique used, the data obtained from the expert material assessment, media expert assessment, and student response test were processed, and the results are as follows:

1. Due diligence by material experts. The assessment of the eligibility questionnaire calculations results by material experts can be seen in Table 3.

Table 3. Results of the Questionnaire Calculation of Material Expertise

No	Material Expert	Score	Qualitative Data Criteria
1.	Dra. Sumargiyani, M.Pd.	128	Very Good
2.	Kristanta Adi B, S.Pd.	114	Good
3.	Bustantika Lutfi H, S.Pd.	108	Good
	Amount	350	Good
	Average	116,67	Good

From Table 3, it can be seen that the average score of the material expert assessment is 116.67. These results indicate that the module developed is seen in terms of material included in the good category.

2. Due diligence by media experts. The assessment of the results of the eligibility questionnaire calculations by media experts can be seen in Table 4.

Table 4. Results of the Calculation of the Eligibility Questionnaire for Media Experts

No	Material Expert	Score	Qualitative Data Criteria
1.	Dra. Sumargiyani, M.Pd.	128	Very Good
2.	Kristanta Adi B, S.Pd.	125	Good
3.	Bustantika Lutfi H, S.Pd.	114	Good
	Amount	367	Good
	Average	122,33	Good

From Table 4, it can be seen that the average score of the results of the assessment of media experts is 122.33. These results indicate that the module developed is seen in terms of media included in good.

3. Student Response Test. Tests the students' responses to mathematical module products are known based on the questionnaire results given and filled out by students during product I for small classes

and product tests for broad types. The results of the questionnaire calculation of student responses to the mathematics module can be seen in Table 5, namely:

Table 5. Results of Calculation of Student Response Questionnaire

No	Activity	Average score	Category
1	Product trials	118	Good
2	Product test	116,5	Good
	Average score	117,25	Good

From Table 5, it can be seen that students' responses to the good module are shown by an average score of 118 in product trials and in product tests with an average score of 116.5 included in the good category. From the two tests conducted, it can be concluded that the mathematical modules developed in the very good category are shown with an average of 117.25 and are worthy of use in learning.

CONCLUSION

Based on the results of research on the development of a Proportion material mathematics module based on the 2013 curriculum that has been carried out, the following conclusions are obtained:

1. The development of a Proportion material mathematics module based on the 2013 curriculum is carried out through several stages: potential and problems, data collection, product design, design validation, design revision, product trials, and product revisions.

2. Module eligibility. The mathematics module of material compared with the 2013 curriculum developed is said to be suitable for use in learning based on the results of assessments from material experts, media experts, and student responses. The module assessment results by the material obtained an average score of 116.67 with good criteria, and media experts got an average score of 122.33 with good criteria. While the results of student responses to the module obtained an average score of 116.5 with very good criteria.

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