

THE DEVELOPMENT OF RELATION AND FUNCTION MODULES BASED ON REALISTIC MATHEMATICS EDUCATION (RME) APPROACHES WITH INTEGRATED ISLAMIC VALUES

Indah Dwi Putri ¹, Ismail Mulia Hasibuan ² & Noviarni ³

^{1,2,3}*Pendidikan Matematika UIN Suska Riau*

Jl. H.R Soebrantas No. 155 KM. 15 Simpang Baru Panam Pekanbaru Riau

Email: indahdwiputri0712@gmail.com , imhasibuan@uin-suska.ac.id &

noviarni@uin-suska.ac.id

Abstract

The development model used is ADDIE (Analysis, Design, Development, Implementation and Evaluation) with the aim of producing a module based on a Realistic Mathematics Education (RME) approach that integrates Islamic values in relational and functional materials that meet valid, practical and effective criteria. The research was conducted at Islamic Junior High School Darussakinah Batu Bersurat. The data collection techniques used in the form of questionnaires and posttest questions. The research instrument validity consisted of a research instrument validation sheet, a module validation sheet by an educational technology expert and learning materials. It also used a practical instrument, namely a student response questionnaire, and an effectiveness instrument, namely a posttest. The data used in the form of quantitative and qualitative data. The data obtained were analyzed with qualitative descriptive and quantitative descriptive analysis techniques. Based on data analysis, it was found that the developed module was declared very valid with an average validity of 95,26%, it was very practical with the practicality about 86,56% , it is also effective. The results of the study indicate that the module that has been developed can be used for learning mathematics on relations and functions in Islamic schools.

Keywords: *Realistic Mathematics Education (RME), Islamic Values Integrated , Relation and Function*

Introduction

Education is a process of learning that is planned in order to make the students become active and develop their ability, so they can face all of the changes happen because of the innovation of knowledge and technology (Ekawati, 2009). In Al-Quran verse, it stated that about someone who motivated to get knowledge. It is written on Al Mujadilah surah on 11 verse:

يَا أَيُّهَا الَّذِينَ ءَامَنُوا إِذَا قِيلَ لَكُمْ تَفَسَّحُوا فِي الْمَجَالِسِ فَافْسَحُوا يَفْسَحِ اللَّهُ لَكُمْ وَإِذَا قِيلَ فَأَنْشُرُوا فَأَنْشُرُوا يَرْفَعِ اللَّهُ
الَّذِينَ ءَامَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ ۝ ١١

As it is known, in the Qur'an shows humans have the potential to master science one of them is mathematics. Mathematics is a basic science which is used as a tool to study other related sciences (Sukrul Hamdi, 978). This is in accordance with Permendikbud number 21 of 2016 concerning Standard Content for Mathematics Subjects for all levels of compulsory primary and secondary education. The government has tried to improve the quality of

education in Indonesia, one of the government's efforts is to establish the 2013 curriculum in the national education system (2011).

Based on the fact that is found in the field from the results of discussions with teachers and observations made by researchers at MTs Pondok Pesantren Darussakinah Batu Bersurat, it show that many students are less active in the online learning process carried out. As a result, students' understanding of learning materials is low. Learning resources used during teaching and learning are only textbooks. At the stage of finding a concept the teacher rarely / does not involve the students. Whereas the expected goal of learning mathematics is that students should experience the learning process and with the direction and guidance of teachers, students find their own mathematical concepts and are able to solve mathematical problems that are relevant to everyday life in society. For this reason, researchers want to develop teaching materials that are worth in innovation, so that they can support the learning process and improve students' conceptual understanding of the material. Teaching materials that are worth in innovation are modules. According to Prastowo, Modules are teaching materials that are arranged according to rules or systemically in a language that is easily understood by students according to the level of understanding of students and the age of students, so that students can learn independently with minimal guidance from the teacher (Prastowo, 2012). The module is self-instructional, meaning that the teaching materials arranged in the module can be studied by students with limited assistance from the teacher. Due to the nature of the self-instruction module, it makes the learning process of mathematics at school become enjoyable and fun.

Learning mathematics in schools should be able to create an atmosphere in such a way that students can feel happy and comfortable in the learning process. One of the efforts that can be done is to develop a module based on the Realistic Mathematics Education (RME) approach. Realistic Mathematics Education (RME) is a learning theory that developed in the Netherlands by Freudenthal, since 1971. Thus, Realistic Mathematics Education (RME) itself is an approach to learning mathematics that expresses experiences and events with students as a means to understand mathematical problems (Hulukatti, 2014). RME emphasizes that mathematics education must be related to everyday realities that are close to students' minds so they can be imagined by students. The RME approach is expected to be able to motivate students and their achievements will increase in doing the tasks and exercises given. As in the Qur'an surah Al-Maidah verse 35:

يَا أَيُّهَا الَّذِينَ ءَامَنُوا اتَّقُوا اللَّهَ وَابْتَغُوا إِلَيْهِ الْوَسِيلَةَ وَجَاهِدُوا فِي سَبِيلِهِ لَعَلَّكُمْ تُفْلِحُونَ ۝ ٣٥

The verse above explains that as educators, we must find the best way that makes it easier for students to receive Allah's knowledge and get close to Allah SWT. The goal of an educator is to help students develop themselves by helping each individual in realizing the potential that exists in it.

In fact, along with the increasingly complex phenomena of global life, student behavior patterns are extremely influenced by modernist culture. Western culture often causes students to do something outside of Islamic values. This creates a moral crisis among students. So, this creates a moral crisis among students. Another problem shows that school hours are more dominated by general lessons than religious lessons. In addition, learning in schools emphasizes the cultivation of concepts, formulas, and theories. The world of education provides a very large portion of knowledge, but does not develop attitudes/values and behavior in learning. The learning that must be applied is learning that is not only able to lead students to the attainment of knowledge, but also the achievement of understanding and application of Islamic values, namely education that combines faith,

shari'ah, and morals in a learning order with Islamic character. Therefore, it is also necessary to integrate religious values in each of teaching and learning process at schools, one of which is learning mathematics.

Islamic values are values that are sourced directly from the Qur'an and Hadith which have an important meaning in educational value, especially for Muslims. Islamic values become a strong foundation that will lead humans to achieve happiness in life. Without Islamic values, all worldly attributes, such as wealth, rank, science and technology, and offspring will not be able to lead humans to achieve happiness in both the world and the life after death. Several learning strategies associated with inculcating Islamic teaching values that can be carried out in learning mathematics subjects are: 1) Always Mention the Name of Allah, 2) Use of Terms, 3) Visual Illustrations, 4) Applications or Examples, 5) Insert Relevant Verses or Hadith, 6) Historical Tracing, 7) Topic Network, and 8) Symbols of Kauniah Verses (Verses of the Universe). To create a meaningful mathematics teaching and learning process, it can be done by integrating values in the teaching and learning process. Integration is an attempt to combine something into one whole or round. Integration is also defined as a unit that cannot be separated. Based on definition above, integration is an effort made by a person in combining two or more objects into a unified whole and cannot be separated. The integration of Islamic values in mathematics is an attempt to integrate mathematics with Islamic religious knowledge without eliminating the uniqueness of the two sciences. The teaching and learning process related to Islamic values is the incorporation of Islamic values with mathematics learning either material or questions (Khoiriyah & Rizki, 2017).

The availability of modules that have Islamic values with realistic learning models are still rarely used in teaching and learning process. Teaching materials by using modules with the integration of Islamic values are one of the teaching materials that can overcome these problems, so that students not only think that mathematics has a lot of numbers and formulas but also Islamic values contained in it.

The results of similar research conducted by Suci Yuniati and Arnida Sari show that the module developed with the Realistic Mathematics Education (RME) Approach on triangle material for Madrasah Tsanawiyah (MTs) Al-Munawwarah Pekanbaru and MTs Negeri Danau Binguang Kampar. The results of the calculation of the validity test data by educational technology experts obtained the ideal percentage of 85.19% and by learning materials experts obtained 86.42%, and the practicality assessment during the trial obtained 84.14%. The data shows that the mathematics module that integrates Islamic values through the Realistic Mathematics Education (RME) approach that was developed is feasible and practical for students to use (Yuniati & Sari, 2018).

Based on the explanation above, it can be concluded that Islamic values can be integrated in the mathematics learning process, where Islamic values are included in the learning process so that the learning has an Islamic nuance. The implementation of Islamic values is also integrated in the Realistic Mathematics Education (RME) approach.

Another problem regarding one of the materials in mathematics, namely relations and functions, it is known that there are still students who have difficulty in understanding this material. The difficulties faced by students tend to be when solving problems related to relations and functions by using various representations. This can be seen from the assessment of learning outcomes which are still low. This is proved by the information provided by students that there are indeed difficulties experienced by students in this

material. In general, the difficulties experienced by students are students' incomprehension to solve problems related to relations and functions by using various representations.

Based on this description, the authors are interested in taking the research title "Development of a Mathematics Module Based on an Integrated Realistic Mathematics Education (RME) Approach to Islamic Values in Relational and Functional Materials". This module is expected to help in the learning process.

Method

This research is a development research because it produces a product. Research and development is a research method used to produce certain products and test the effectiveness of these products (Sugiyono, 2016). The research design used the ADDIE research model. The ADDIE model is suitable for the development of teaching materials as follows, which is the cycle of the ADDIE research model.

The subjects in the research were 32 students of class VIII MTs Pondok Pesantren Darussakinah. The questionnaire technique was used to collect data regarding the assessment of various validation aspects of the module and the practicality of the module. The data collection instruments were in the form of a validation questionnaire sheet and a practicality questionnaire sheet. Prior to testing, the module was validated by 5 validators consisting of 3 validators who are learning material experts, 2 validators are technology experts. The data analysis technique used is a qualitative descriptive analysis technique and a quantitative descriptive analysis technique. This qualitative descriptive analysis technique was used to analyze the results of the review of learning material experts, educational technology experts and Islamic material experts in the form of suggestions and comments regarding the improvement of the RME-based relational and function module integrated with Islamic values. Quantitative descriptive analysis is done by analyzing quantitative data in the form of numbers obtained from questionnaires.

After obtaining the validity results from the validators and practicality from students, the percentage level can be adjusted according to the validity criteria table according to (Sugiyono, 2019) as follows:

Table 1. Interpretation of Module Validity Data
Integrated Islamic Values through
RME approach

No	Interval	Criteria
1	81% – 100%	Strongly Valid
2	61% – 80%	Valid
3	41% – 60%	Enough Valid
4	21% – 40%	Less Valid
5	0% – 20%	Invalid

Result and Discussion

The results of this study are described in accordance with the development model used by the researcher, namely the ADDIE model which consists of five stages, namely: Analysis. The analysis step consists of two stages, namely performance analysis and needs analysis. Performance analysis is carried out to find out and clarify whether the performance problems faced require solutions in the form of program implementation or management improvements. The problem faced in this research is the limited use of modules used in learning mathematics so that module development is needed. Needs analysis is a necessary step to determine the abilities or competencies that students need to learn. The stages of needs analysis carried out are to review the applicable curriculum, analyze core competencies and basic competencies for relation and function materials, and develop indicators for relation and function materials based on core competencies and basic competencies. The material is studied by using RME learning steps in the form of giving mathematical problems associated with Islamic material. In addition, the material is also equipped with nuanced images or Islamic values such as religious images, the Quran, and others. Examples of activities carried out are also in accordance with Islamic values. The material is presented interactively so that students are actively involved in learning mathematics and can complete exercises independently according to the RME learning model.

The Design is next step for the relation and function modules based on the RME approach that integrates Islamic values. The steps of the research design are: a) Determine the title of the worksheet. The title of the worksheet is determined based on the basic competencies, indicators, and learning materials listed in the curriculum; b) Prepare source books and other reference books. Then, collect material by analyzing the syllabus and mathematics books for class VIII. Reviewing the literature on the concept of integration, interpretation of the Qur'an and Hadith; c) Identify basic competencies based on the curriculum, and design appropriate forms of learning activities; d) Identify indicators of competency achievement and design the form and type of assessment to be presented; e) Designing the module. At the module design stage, components related to the module are arranged.

Development is carried out after completing the module design, and then the developed module is validated by validators, educational technology experts, and material experts using a questionnaire. This validation aims to see whether the developed module is feasible or not to be tested. The results of the validation of the learning material experts on the RME-based relation and function module showed that 99.00% was categorized as strongly valid and 91.53% was categorized also as strongly valid.

The implementation of the module that has been developed and declared valid is then tested in small groups by giving the module to students. Researchers conducted a try out to a small group with a total of 8 students as respondents. The tryout of the small group was obtained with a percentage of 87.50%, then the module was revised and tested to a limited group and the results of the trial stated that the module was in the very practical category with a percentage of 86.56%.

Next is Evaluation. The evaluation stage is carried out after conducting validation and field trials. The RME-based relation and function module integrated with Islamic values has been declared valid by learning material experts and educational technology experts. Then, at the practical trial stage in small groups, it was carried out to determine the

practicality of the developed module. The practicality test of the module was carried out by giving a practicality questionnaire after students used the RME-based module integrated with Islamic values to 8 class VIII students of Madrasah Tsanawiyah Pondok Pesantren Darussakinah. From the results of the practical analysis of this small group, it can be stated that the module developed is included in the very practical criteria with a percentage of 87.50%. Practical analysis of the limited group was carried out to determine the level of practicality of the developed module. The practicality test of the module was carried out by giving a practicality questionnaire after students used the RME-based module integrated with Islamic values to 32 students of class VIII A Madrasah Tsanawiyah Darussakinah Islamic Boarding School. From the results of the practical analysis of this limited group, it can be stated that the module developed is included in the very practical criteria with a percentage of 86.56%.

Conclusionn

Based on the results of calculations and analysis of research data carried out at Madrasah Tsanawiyah Darussakinah Islamic Boarding School regarding the development of an RME-based module that integrates Islamic values in the material of relations and functions, the results of the development of a relation and function module based on RME integrated Islamic values in the form material are stated. very valid with a percentage of 99.26%. This shows that the developed module has met the aspects of content feasibility, presentation feasibility, language feasibility, graphic feasibility and conformity with RME-based modules. Thus the developed module can be used in the learning process at school. The RME-based relation and function module integrated Islamic values in the resulting relation and function form material was in the very practical category in a small group trial with a percentage of 87.50%, then the module was revised and tested to a limited group and the results of the trial it states that the module is in the very practical category with a percentage of 86.56%. This shows that the developed module has met the practicality criteria. The RME-based mathematics module integrated with Islamic values in the form of relations and functions has been categorized as Effective based on that $t_{\text{calculated}}=4.21$ is greater than $t_{\text{table}}=1.69$. In addition, the effectiveness of the module can be seen from the average posttest value of the experimental class (mean=81) which is higher than the average posttest value of the control class (mean=66.09.)

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