

Development of Mathematics Learning Module Based on *Realistic Mathematics Education* (RME) Approach in SPLDV Materials

Lisa Levia Miranda¹, Siti Suprihatiningsih^{*2}, Rizki Nurhana Friantini³, Konstansia Hermiati⁴, Pradipta Annurwanda⁵

^{1,2,3,4,5}Department of Mathematics Education, STKIP Pamane Talino Ngabang, Indonesia

*s.suprihatiningsih@stkippamanetalino.ac.id

ABSTRACT

Learning mathematics which is still abstract makes it difficult for students to understand the material of a two-variable linear equation system. It is necessary to arrange modules with realistic content to make it easier for students to understand the material. The research aims to develop a Mathematics learning module based on the Realistic Mathematics Education (RME) approach to the Material of a Two-Variable Linear Equation System. The research method developed is the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The instruments used in this study were validation sheets, observations, and learning outcomes tests. Validation sheet to obtain data about the results of the validation of experts regarding the module, observation sheet to see the implementation of the module. Test results to determine the average percentage of student test scores. Data analysis was carried out to obtain a suitable and qualified mathematics learning module that met the valid, practical, and effective criteria. The criteria for the level of validity, practicality, and effectiveness of the module that are considered sufficient to continue at the next stage are at least ≥ 60 . Based on the results of the limited trial, the results obtained were very good, students felt happy and excited during the delivery process. To the illustrations in the module that were distributed to students, their response was enthusiastic and enthusiastic in working on the practice questions during the learning process. It can be seen from the results of the evaluation carried out by the students that it produced a positive response, so that the percentage of the students' positive response was the lowest at 80.49. This means that the development of this module is very useful and beneficial for students.

Keywords: Development of Mathematics Learning Module, Realistic Mathematics Education, SPLDV.

ABSTRAK

Pembelajaran matematika yang masih abstrak membuat siswa sulit untuk memahami materi sistem persamaan linear dua variabel. Perlu disusun modul dengan muatan realistik untuk memudahkan siswa memahami materi. Penelitian bertujuan untuk mengembangkan modul pembelajaran Matematika berbasis pendekatan *realistic mathematics education* (rme) pada materi sistem persamaan linear dua variabel. Metode penelitian yang dikembangkan adalah model ADDIE (*Analysis, Design, Development, Implementation, Evaluation*). Instrumen yang digunakan dalam penelitian ini, yaitu lembar validasi, observasi, dan tes hasil belajar. Lembar validasi untuk memperoleh data tentang hasil validasi para ahli mengenai modul, lembar observasi untuk melihat keterlaksanaan modul. Hasil tes untuk mengetahui persentase rata-rata skor tes siswa. Analisis data dilakukan untuk mendapatkan modul pembelajaran matematika yang layak digunakan dan berkualitas memenuhi kriteria valid, praktis, dan efektif. Kriteria tingkat validitas, praktikalitas, dan keefektifan modul yang dianggap cukup untuk melanjutkan pada tahap berikutnya minimal ≥ 60 . Berdasarkan hasil uji coba terbatas hasil yang didapatkan sangat baik, siswa merasa senang dan bersemangat selama proses penyampaian. Terhadap ilustrasi gambar dalam modul yang dibagikan kepada siswa, respon mereka adalah antusias dan bersemangat dalam mengerjakan soal-soal latihan selama proses pembelajaran berlangsung. Terlihat dari hasil evaluasi yang dikerjakan siswa menghasilkan respon positif, sehingga persentase respon positif para siswa paling rendah adalah 80,49. Artinya pengembangan modul ini sangat berguna dan bermanfaat bagi peserta didik.

Kata kunci: Pengembangan Modul Pembelajaran Matematika, Realistic Mathematics Education, SPLDV.

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Introduction

Mathematics as one of the basic sciences, both in applied aspects and in reasoning aspects, has an important role in efforts to master science and technology. An indication of the importance of mathematics can be seen from learning mathematics as one of the subjects given at every

level of education. Mathematics taught at the elementary (SD and SMP) and secondary (SMU and SMK) levels is known as school mathematics (*School Mathematics*). School mathematics are parts of mathematics that are chosen on the basis of educational meaning, namely to develop students' abilities and personalities as well as real developmental guidance from the living environment which is constantly evolving along with the progress of science and technology (Ningsih, 2014). One of the materials in mathematics is a two-variable linear equation system (SPLDV). SPLDV material is one of the competencies that must be mastered by class VIII Junior High School (SMP) students. SPLDV material is very closely related to everyday life, some of the problems that are often related to this material are buying and selling problems, industry, and so on. The learning experiences gained from the SPLDV materials include: 1) making a linear equation of two variables; 2) determine the solution of a linear equation of two variables; 3) create mathematical models of everyday problems related to a system of linear equations with two variables, and 4) solve real problems related to a system of linear equations with two variables (Kurniawati, 2020).

The reality is that there are still many students who have difficulty understanding mathematics learning materials. The ability of students to understand abstract things in mathematics is highly dependent on the models, strategies or teaching materials used by teachers in classroom learning (Shaufia & Ranti, 2020). Based on observations obtained by researchers at SMPN 3 Sengah Temila, students have not achieved optimal learning achievement which is shown from the results of students' test scores and the provision of material only from available textbooks and LKS, in the learning process students are often found to be lazy to read and take notes, as well as Methods learning used in schools still uses conventional methods, namely lecture and question and answer methods.

Based on the problems above, efforts that can be made are by developing teaching materials, namely modules that make it easier for students to understand the material using everyday language. Modules are teaching materials that can be studied by students, which consist of planning, objectives, learning materials and evaluation tools used to measure student success. The module also makes it easier for teachers to deliver learning materials that are in accordance with the conditions of students in the field, because basically the module is made to make it easier for children to understand learning materials, especially for 3T areas, for example the Landak district. In addition to the use of teaching materials in learning, to help achieve learning objectives, you must use teaching methods or approaches that are in accordance with the problems at hand. According to (Wulandari et al., 2019) the module as one of the teaching materials has one of the characteristics is the principle of independent learning. The advantages of learning with modules are (a) the module can provide feedback so that learners know their shortcomings and immediately make improvements, (b) in the module clear learning objectives are set so that student learning performance is directed towards achieving learning objectives, (c) designed modules interesting, easy to learn, and can answer the needs of course will lead to student motivation to learn, (d) the module is flexible because the module material can be studied by students in different ways and speeds, (e) cooperation can be established because the competition module can be minimized and between learning and learners, and (f) remedial can be done because the module provides sufficient opportunities for students to be able to find their own weaknesses based on the evaluation given. The development of teaching materials that can help students' teaching and learning process is using the *Realistic Mathematics Education* (RME) approach. According to (Putri et al., 2020) the *Realistic Mathematics Education* (RME) approach is an approach to learning mathematics that places mathematical

problems in life. students' daily lives, making it easier for students to receive material and provide direct experience with their own experiences.

A module is a teaching material that is systematically arranged using language that is easily understood by students according to their level of knowledge and age, so that they can learn independently (independently) with minimal assistance or guidance from educators (Kalinda, & Maharta, nd). According to Pummawan, a module is a kind of instructional device equipped with independent learning that students can learn on their own (Rohmiyati et al., 2016). Parmin & Peniati also stated that the module is an important component in learning because it can help students obtain important information about learning materials (Suastika & Rahmawati, 2019). The purpose of the module is to help students gain knowledge and find learning that is objective. Modules are learning tools in written or printed form that are systematically arranged, contain learning materials, methods, learning objectives based on basic competencies or indicators of competency achievement, instructions for independent learning activities (*Self Introductory*) and provide opportunities for students to test themselves through practice questions. presented in the module, Hamdani in (Haristah et al., 2019). The main purpose of learning with modules is to increase the efficiency and effectiveness of learning in schools, both time, funds, facilities, and energy in order to achieve goals optimally (Setiyadi, 2017).

Realistic Mathematics Education (RME) approach is mathematics learning that utilizes student activities in reality and their environment to transform problems in their daily lives into symbols and mathematical problem solving models (Sutisna & Subarjah, 2016). *Realistic Mathematics Education (RME)* approach is mathematics learning that is linked to real life, then students can build their own knowledge in solving a problem (Sutisna & Subarjah, 2016). According to Hamdani *Realistic Mathematics Education (RME)* is carried out by linking and involving the environment around students, real experiences that students have experienced in everyday life, making mathematics a student activity (Haristah et al., 2019). With the RME approach, students are not only brought to the real world that is in students' minds. So, students are invited to think about solving problems that are often experienced in everyday life.

The results of previous studies indicate that the learning module developed can be said to be effective so that the RME-based module can be used to support student learning processes at school and at home. student learning completeness reaches 90.00% which is still in the effective category (Putri et al., 2020). RME learning, connecting mathematics with reality as a human activity. So that students can imagine the contextual problems given and understand the concepts given, mathematics which is considered abstract can be understood concretely by students (Ramadanti & Marlina, 2019). Based on the data analysis conducted, a realistic-based module can be produced for the set material in class VII SMPN 24 Padang which is very valid with 4.55 criteria from aspects of material, presentation, language and legibility and graphics. In addition, the realistic-based module for set material in class VII SMPN 24 Padang is very practical with 90% criteria from aspects of convenience, time, interpretation and equivalence (Afreni et al., 2001). The product resulting from this research and development is E-module. "This product development is carried out by referring to the research and development design of the ADDIE model. Based on the results of product trials and discussion, it can be concluded that the *e-module* assisted by sigil software is feasible to be used and applied as a learning medium with an average score of 3.70 material experts and 3.54 media experts. The results of the *effect size* test with a score $E_s = 0,52$ indicate that the developed *e-module* is effectively used as a medium to assist the learning process (Fitri et al., 2021). The latest thing from this research is that in teaching and learning activities in the classroom, teachers have not used

learning modules. Teachers only use textbooks and worksheets which are used as a source of learning materials and worksheets. Meanwhile, students use books available in the school library and student worksheets. In the learning process it is often found that students tend to be lazy to read and take notes, and the learning methods used in these schools still use conventional methods, namely the lecture and question and answer method. So that the purpose of this research is to produce a guidebook product according to the needs of teachers and students in schools. Through the development of a Mathematics learning module based on the *Realistic Mathematics Education* (RME) approach to the Material of a Two-variable Linear Equation System for class VIII students of SMPN 3 Sengah Temila.

Research methods

The development design that will be used in this research is ADDIE (*Analysis, Design, Development, Implementation, Evaluation*). The stages carried out in this development are: (1) *Analysis*; This is done to collect various information as material for product planning to be developed. The analysis stages include curriculum analysis, student analysis and student needs analysis. (2) *Design*; develop a framework for learning mathematics modules based on the *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system, a map of the needs for a mathematics learning module based on the *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system, and compile an assessment sheet. (3) *Development*; writing a *draft* of a mathematics learning module based on a *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system and validating it before being tested. (4) *Implementation*; tested the mathematics learning module based on the *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system, carried out tests, and distributed response questionnaires. (5) *Evaluation*; perform analysis and improvement of problems that occur during the learning of this research technique is observation and tests.

Table 1. Criteria for Validity Level

Criteria	Category
$0 < x < 21$	Invalid
$21 < x < 41$	Less Valid
$41 < x < 61$	Quite Valid
$61 < x < 81$	Valid
$81 < x < 100$	Very Valid

The instruments used in this study were validation sheets, observations, and learning outcomes tests. The validation sheet is used to obtain data on the results of the expert's validation regarding the mathematics learning module based on the *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system. This instrument aims to determine the value of the validity of the modules developed based on aspects of competence, content, and conformity with guided inquiry based. The validator writes down the appropriate score by placing a check mark (\checkmark) in the appropriate row and column, and is asked to provide a general assessment conclusion about the mathematics learning module based on the *realistic mathematics education* (RME) approach to the material for the system of linear equations of the two variables with the categories very good, good, enough, less, and less. In this study the validity criteria used were minimally valid criteria. Then the value of the validity level is adjusted according to the table 1.

The observation sheet is used to see the implementation of the mathematics learning module based on the *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system obtained from observations during the learning process. The implementation of the mathematics learning module based on the *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system is seen from the ease of use, readability, content, and time. Furthermore, the data used to improve the module that was developed after being tested in the learning process. In this study, the validity criteria used were minimal in terms of quite practical criteria. Then the value of the practicality level is adjusted according to the table 2:

Table 2. Practicality Level Criteria

Criteria	Category
$0 < x < 60$	Not practical
$21 < x < 70$	Less practical
$41 < x < 80$	Practical enough
$61 < x < 90$	Practical
$81 < x < 100$	Very practical

The test results are used to determine the average percentage of student learning outcomes test scores. From the test results, the percentage of students' classical completeness will be obtained to determine the effectiveness of the module. Learning outcomes tests are given to students at the end of the lesson to determine the completeness of students' understanding after the learning is completed. The test material in this study is a system of linear and variable equations, the number of questions is 10 questions in the form of essay questions.

Data analysis was conducted to obtain a mathematics learning module based on the *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system that is feasible to use and has quality that meets the valid, practical, and effective criteria. The following is an explanation of the data analysis of each instrument. The validity data was obtained from the validation sheet. The data obtained is then calculated using the formula 1:

$$\text{Validity level (x)} = \frac{\text{skor yang diperoleh}}{\text{jumlah skor tertinggi}} 100 \% \quad (1)$$

The criteria for the level of validity of the module which is considered sufficient to continue at the next stage if it reaches more than equal to 60.

Practical data were obtained from the observation sheet on the implementation of the mathematics learning module based on the *realistic mathematics education* (RME) approach on the material of a two-variable linear equation system. The data obtained is then calculated using the formula 2:

$$\text{Practicality rate} = \frac{\text{skor rata-rata}}{\text{jumlah maksimal}} 100 \% \quad (2)$$

The criteria for the practicality level of the module are considered sufficient to continue at the next stage if they reach more than or equal to 60.

The effectiveness of the mathematics learning module data is obtained from the test scores of student learning outcomes which are carried out at the end of the lesson. The quality of effectiveness is determined by the percentage of completeness of student learning outcomes. The formula 3 used to calculate the data is as follows:

$$\text{Value} = \frac{\text{jumlah siswa tuntas}}{\text{jumlah siswa}} 100 \% \quad (3)$$

Thus, the criteria for the practicality level of the mathematics learning module based on the *realistic mathematics education* (RME) approach on the two-variable linear equation system material is said to be effective if the student's mastery percentage is at least 60.

Results and Discussion

Research result

The development of mathematics learning modules based on the *Realistic Mathematics Education* (RME) approach based on the ADDIE Model, which includes five stages, namely the Analysis, Design, Development, Implementation, and Evaluation stages.

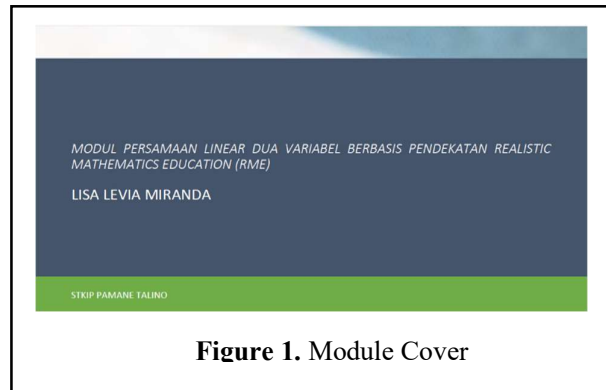
Analysis Phase (Analysis)

In the analysis phase, the researcher collects data and information related to the research problem. Researchers obtained analytical data as needed through observation and interviews at SMP Negeri 3 Sengah Temila. At the time the observations were made in class VIII, in teaching and learning activities in class, the teacher had not used the learning module. The teacher uses the textbook that is used as a source to be explained back to the students. Meanwhile, students use books available in the school library. the provision of material only from available textbooks and worksheets, in the learning process it is often found that students tend to be lazy to read and take notes, and the learning methods used in the school are still using conventional methods, namely the lecture and question and answer method. This observation was carried out as the first step in finding problems related to learning mathematics in class VIII. In addition, observation activities also provide solutions so that researchers can produce guidebook products according to the needs of teachers and students in schools.

From the observations above, efforts that can be made are by developing teaching materials, namely mathematics learning modules based on the *Realistic Mathematics Education* (RME) approach. students have experienced in their daily lives and this module can be used as a reference for teachers and students in the learning process. After the observations were made, the researcher concluded that the student's learning achievement was not optimal and the material provided was only from the available textbooks and worksheets. So it takes a mathematics learning module based on the *Realistic Mathematics Education* (RME) approach in order to assist students in developing learning abilities by linking and involving the environment around students and real experiences that students have experienced in everyday life and this module can be used as a reference for teachers and students. in the learning process. Based on the results of observations of the implementation of mathematics learning at SMP Negeri 3 Sengah Temila, it is known that the curriculum used is the 2013 Curriculum (K13). Where K13 is a student-centered learning activity. Adjustment of the content of the material in the module is adjusted to the book and directs students to be active in learning.

Design Stage (Design)

The researcher designed a mathematics learning module based on the *Realistic Mathematics Education* (RME) approach. The contents of the module consist of: module cover; foreword; table of contents; core competencies, basic competencies, and indicators; Theory; exercises. The cover of the module and the cover of the manual were made using Microsoft word 2007. The cover of the module was printed using HVS paper. The cover of the module is entitled "Development of Mathematics Learning Module Based on *Realistic Mathematics Education* (RME) Approach on Two Variable Linear Equation System Materials for Class VIII Students of SMPN 3 Sampang Temila. The letters are written using the Calibri light headings typeface with a size of 14pt, as shown in figure 1 below.



Translate in english:
A Two-Variable Linear Equation Module Based on a Realistic Mathematics Education Approach

Figure 1. Module Cover

The preface contains gratitude for the completion of the module. The introduction also includes an outline of the contents of the book and an apology for deficiencies in the manual, a request for constructive criticism and suggestions to improve the module guide, as shown in figure 2 below.

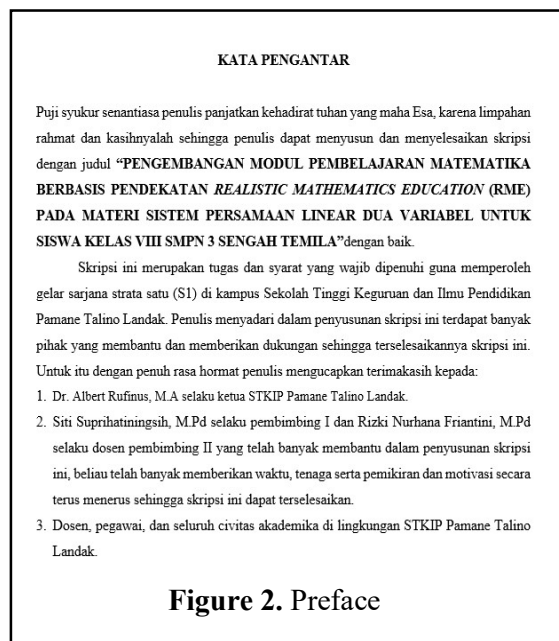


Figure 2. Preface

Translate in english:

Preface

Praise and gratitude the author always prays to the presence of God Almighty, because of the abundance of grace and love so that the author can compose and complete a thesis with the title "*DEVELOPMENT OF MATHEMATICS LEARNING MODULE BASED ON REALISTIC MATHEMATICS EDUCATION (RME) ON LINEAR EQUATION SYSTEM MATERIALS FOR TWO VARIABLE CLASS VIII SMP 3 SENGAH TEMILA*" well.

This thesis is a task and requirement that must be met in order to obtain a bachelor's degree (S1) at the Pamane Talino Landak School of Teacher Training and Education. The author realizes that in the preparation of this thesis there were many parties who helped and provided support so that the completion of this thesis. For this reason, the author sincerely thanks:

1. Dr. Albert Rufinus, M.A as the head of STKIP Pamane Talino Landak.
2. Siti Suprihatiningsih, M.Pd as supervisor I and Rizki Nurhana Friantini, M.Pd as supervisor II who have helped a lot in the preparation of this thesis, he has given a lot of time, energy and thoughts and motivation continuously so that this thesis can resolved.
3. Lecturers, employees, and the entire academic community in STKIP Pamane Talino, Landak Regency.

Table of contents, contains a list of titles in the contents of the module. table of contents is made to make it easier for readers to find pages in each title and sub-heading of the content of the module, as shown in figure 3 below.

DAFTAR ISI		Translate in english:	
Membuat Persamaan Linear Dua Variabel	4	<p style="text-align: center;">Table of Contents</p> <p>Create a linear equation for two variables..... 4</p> <p>Theory..... 5</p> <p>Project 7</p> <p>Independent evaluation..... 11</p> <p>Determine the solution to the linear equation of two variables..... 13</p> <p>Theory..... 14</p> <p>Project 15</p> <p>Independent evaluation 16</p>	
Materi	5		
Proyek	7		
Evaluasi Mandiri	11		
Menentukan Selesaian Persamaan Linear Dua Variabel.....	13		
Materi	14		
Proyek	15		
Evaluasi Mandiri	16		

Figure 3. Table of Contents

The Guide Module for Learning Mathematics Based on *Realistic Mathematics Education* (RME) Approach is prepared based on Core Competencies, Basic Competencies, and Indicators in the 2013 Curriculum (K13), as shown in figure 4 below.

KOMPETENSI INTI		Translate in english:	
Memahami sistem persamaan linear dua variabel dan menggunakannya dalam pemecahan masalah		<p style="text-align: center;">CORE COMPETENCIES</p> <p>Understand the system of linear equations of two variables and use them in problem solving</p> <p style="text-align: center;">BASIC COMPETENCIES</p> <p>1. Solve a system of linear equations of two variables.</p> <p>2. Create a mathematical model of the problem related to a system of linear equations of two variables.</p> <p style="text-align: center;">INDICATOR</p> <p>1. Solve the system of linear equations of two variables using the elimination method.</p> <p>2. Solve the system of linear equations of two variables with the substitution method.</p> <p>3. Solve the system of linear equations of two variables using the elimination-substitution method (combined).</p> <p>4. Create a mathematical model of the problem related to a system of linear equations of two variables.</p>	
KOMPETENSI DASAR			
1. Menyelesaikan sistem persamaan linear dua variabel.			
2. Membuat model matematika dari masalah yang berkaitan dengan sistem persamaan linear dua variabel.			
INDIKATOR			
1. Menyelesaikan sistem persamaan linear dua variabel dengan metode eliminasi.			
2. Menyelesaikan sistem persamaan linear dua variabel dengan metode substitusi.			
3. Menyelesaikan sistem persamaan linear dua variabel dengan metode eliminasi-substitusi (gabungan).			
4. Membuat model matematika dari masalah yang berkaitan dengan sistem persamaan linear dua variabel.			

Figure 4. Core Competencies, Basic Competencies, and Indicators

The material contains understanding and explanations of examples of two-variable linear equation system (SPLDV) questions made using the *Realistic Mathematics Education* (RME) approach, namely linking and involving the environment around students, real experiences that students have experienced in everyday life. Practice Questions, contains questions that will be answered by students, as shown in figure 5.

In this development stage, several things were carried out, including: making learning modules and validating product feasibility. The content of this learning module is mathematics in the VIII grade SPLDV material using the *Realistic Mathematics Education* (RME) approach to linking and involving the environment around students, real experiences that students have experienced in everyday life. After the learning module is completed, product feasibility validation is carried out. The validation of this learning module is carried out by expert validators and requires theoretical and practical considerations. Expert validators consist of material and language expert validators. The validation sheet instrument was given to 3 (three) validators, namely 2 (two) mathematics education lecturers at STKIP Pamane Talino and 1 (one) teacher at SMP Negeri 3 Sengah Temila.

The level of validity obtained from the first material expert validation sheet is 80% which is included in the valid category. Then the level of validity obtained from the second material expert validation sheet is 83.75% and is included in the very valid category. Furthermore, the level of validity obtained from the third material expert validation sheet is 80% and is included in the valid category. The average of the three validator values is 81.25% and is included in the very valid category. Thus, it can be concluded that the problem-based mathematics module is valid.

Implementation

At this stage, all the module designs that have been developed are implemented after revision. Mathematics learning modules based on the *Realistic Mathematics Education* (RME) approach that have been developed are implemented in real situations, namely in the classroom. However, at this stage, the researchers only carried out product trials on small groups (limited tests). The response from students to the learning module that had been developed was very good, students paid close attention to the teacher when delivering material and the results of the exercise provided also got good marks. good. The trial is intended to see the level of practicality in the module. This limited trial consisted of 1 subject teacher and 17 students from SMP Negeri 3 Sengah Temila. Before conducting the trial, the subject teacher conveyed the content of the material in the module that the researcher had developed.

Table 3. Practicality Category

Observation sheet	Practical Category
The first meeting	80%
Second meeting	84.61%
Third Meeting	89.23%
Average	84.61%

The second data collection instrument is the observation sheet. The observation sheet is filled in during the learning process on the linear equations of two variables in the classroom. Based on table 3, the results of the observation sheet that at the first meeting obtained a value of 80% with practical criteria, at the second meeting a value of 84.61% was obtained and the third meeting a value of 89.23%. The average value of the practicality of problem-based mathematics modules is 84.61 %. Thus, it can be concluded that the RME mathematics module is in the practical category.

Evaluation (Evaluation)

Evaluation is the last stage of the ADDIE development model. Because in this study only limited trials, the evaluation referred to here is the evaluation of implementation activities. The evaluation results were obtained from the results of the evaluation tasks carried out by students during the trial, so that from the results of the evaluation tasks, the researchers corrected the students' evaluation tasks to get good grades.

Table 4. Learning Outcome Test

Evaluation	Study Results Test
First indicator	85%
Second Indicator	78.50%
Third Indicator	82%
Average	81.83%

The third data collection instrument is a learning outcome test. The test was given to all students who took part in learning the material for linear equations of two variables as many as 17 students. Based on table 4, the results of the test instruments that have been filled out by students show that the average value for indicator 1 is 85%, the average value for indicator 2 is 78.50%, the average value for indicator 3 is 82%. Then the average value for all indicators is 81.83. This improvement in learning outcomes convinced researchers to conclude that the use of this problem-based mathematics module could improve student learning outcomes.

Discussion

The mathematics learning module is based on the *Realistic Mathematics Education (RME)* approach as an interactive learning module that can be used as a reference by teachers and students in the learning process, and so that students can learn independently. The beginning of making this learning module is to determine what material is suitable and will be used as a subject in making learning modules. The material chosen is “Two Variable Linear Equation System (SPLDV)” which contains text and graphics, equipped with practice questions, and simulations. In making this learning module, there are several obstacles experienced, including: (a) The module design process that will be developed takes a long time, taking into account various things, so that the learning module is completed in quite a long time. (b) The knowledge of the developer is still limited so that in making this module, the developer still needs guidance in the process of making the module from the supervisor in the form of a revision. Based on the initial product that has been made, material experts and module experts are tested, then revisions are made based on assessments and comments from experts. The finished product was revised and then proceeded to the testing phase of 17 students at SMP Negeri 3 Sengah Temila Class VIII.

Based on this limited test, students got very good results, students felt happy and excited in the process of delivering mathematics learning modules based on the *Realistic Mathematics Education (RME)* approach. Student responses can be seen when reading the illustrations in the modules that are distributed to them at the time of delivery of the material, students become more enthusiastic in working on practice questions, as can be seen from the results of the evaluation tasks carried out by students with positive responses from all students with the percentage of positive responses. the lowest is 80.49. Then a final revision is made to create the final product. Like other learning modules, this mathematics learning module based on the *Realistic Mathematics Education (RME)* approach is one of the interactive learning modules

that can be used in the mathematics learning process and provides many benefits for the world of education.

This is increasingly clarified what was stated by (Ningsih, 2014) mathematics as one of the basic sciences, both in applied aspects and in reasoning aspects, has an important role in efforts to master science and technology. An indication of the importance of mathematics can be seen from learning mathematics as one of the subjects given at every level of education. Therefore, based on research conducted through product use testing, this learning module has several advantages, including: (a) Learning using this module is easy for students to understand and time constraints in learning mathematics can be overcome, because this learning module is made using a language that is easy to understand by students and equipped with elements contained in the learning module such as illustrations, sample questions, practice questions, and simulations. (b) This learning module can be used as a reference for teachers and students in the learning process. (c) It can be used as reading material for visitors/readers in the library. In addition, this learning module also has weaknesses, one of which is the limited material in this module. Based on the results of the limited trial, the final result of the student evaluation task obtained a positive response percentage of 88.53% with an average response of 4.32.

Research with the title Geogebra-Based Interactive Learning Media Development with ADDIE Development Model (*Analysis, Design, Development, Implementation, Evaluation*) on Geometry Material for Class XI MIA SMA Negeri 3 Takalar (Walid, 2017), shows the results of material expert validation with an average of 3,1 is in the very valid category, because $3 \leq M < 4$ so that the material on the media is said to be very valid, while the results of media expert validation with an average of 3.05 are in the very valid category, because $3 \leq M < 4$ so that the learning media is said to be very valid. Effective because the learning media is assessed by students with a positive response with an average percentage of positive responses of 88.53% with an average response of 4.32 and the teacher's response with an average response of 4.1 is said to be effective because the percentage of student responses is more than 50%. Practical because the results obtained from the implementation of learning media of 83.3% are said to be practical because the percentage of implementation of learning media is greater than 70%. The results of the research are based on the ADDIE development stage which consists of the analysis, design, and development stages to measure the LKPD validation sheet instrument. It was found that the results of the LKPD validation were 87.92% with a very valid category (Siswati et al, 2021).

Research with the title of learning module development, was carried out by (Haristah et al., 2019) based on the average test scores of classes taught using learning media with the PMRI approach more than the average test scores of classes taught without using learning modules with the PMRI approach, which is 75 for the average value of classes taught using the learning module with the PMRI approach and 69 for the average value of classes taught without using the learning module with the PMRI approach, the average value in the experimental class, namely the class taught using the learning module method is 77.03, while the conventional class has an average value of 70.70. This shows that the average of the experimental class is better than the control class. So, it can be concluded that the use of learning modules with the PMRI approach is more effective than without using the learning media.

Conclusion

Based on this limited test, students got very good results, students felt happy and excited in the process of delivering mathematics learning modules based on the *Realistic Mathematics*

Education (RME) approach. Student responses can be seen when reading the illustrations in the modules that are distributed to them at the time of delivery of the material, students become more enthusiastic in working on practice questions, as can be seen from the results of the evaluation tasks carried out by students with positive responses from all students with the percentage of positive responses. the lowest is 80.49. The process of developing mathematics learning modules based on the *Realistic Mathematics Education* (RME) approach using the ADDIE development model (*Analysis, Design, Development, Implementation, Evaluation*) is carried out in 5 stages, namely: (1) Analysis (*analysis*); (2) Design (*Design*); (3) Development (*Development*); (4) Implementation (*Implementation*); (5) Evaluation (*Evaluation*). Based on this limited test get very good results, students.

The test was given to all students who took part in learning the material for linear equations of two variables as many as 17 students. The results of the test instruments that have been filled out by students show that the average value for indicator 1 is 85, the average value for indicator 2 is 78.50, the average value for indicator 3 is 82, the average value for indicator 4 is 86.50. Then the average value for all indicators is 83. This increase in learning outcomes convinces researchers to conclude that the use of problem-based mathematics modules can improve student learning outcomes.

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