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Development of a Mathematics Learning Module Based on the Realistic Mathematics Education Approach to Enhance Mathematical Conceptual Understanding among Tenth-Grade Students at SMKN 1 Tebo

Rahmadal Weni, Rusdi, Aniswita, Risnawita
UIN Sjech M. Djamil Djambek Bukittinggi, Indonesia
rahmadalweni104@gmail.com

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Abstract

Mathematics instruction for Grade 10 students at SMKN 1 Tebo remained predominantly teacher-centered, employed limited contextual learning materials, and inadequately addressed students' difficulties in understanding abstract mathematical concepts, particularly systems of linear equations in two variables. This study aimed to develop and evaluate a Realistic Mathematics Education (RME)-based mathematics module in terms of its validity, practicality, and effectiveness in supporting students' mathematical conceptual understanding. The study employed a Research and Development (R&D) approach based on Sugiyono's development model, limited to six stages: identifying potentials and problems, collecting information, designing the product, validating the design, revising the design, and conducting product trials. The participants were Grade 10 students at SMKN 1 Tebo. Data were collected using validation sheets, student response questionnaires, and mathematical conceptual understanding tests. The results showed that the module attained a validity score of 87.84%, classified as very valid; a practicality score of 81.76%, classified as very practical;

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and an effectiveness score of 81.48%. These findings demonstrate that the developed RME-based mathematics module is valid, practical, and effective in supporting students' conceptual understanding of systems of linear equations in two variables. The module offers an alternative instructional resource that promotes contextual, active, and meaningful mathematics learning by connecting abstract concepts with problems drawn from everyday life.

Keywords: Conceptual Understanding; Mathematics Learning Module; Realistic Mathematics Education; Research and Development; Systems of Linear Equations in Two Variables

INTRODUCTION

Education constitutes a fundamental human need, as it represents a process of transforming the attitudes and behavior of an individual or a group of individuals through efforts to mature human beings by means of teaching and training, as well as through the processes, methods, and practices of educating (Sihaloho et al., 2023; Zamani, 2022). As stated in the Qur'an, particularly Surah Al-Kahf, verse 66, Prophet Musa asked Khidr to teach him the true knowledge that had been taught to him so that it could serve as guidance. This verse demonstrates that a student expects the assistance of a teacher in obtaining guidance and knowledge. According to Wahbah al-Zuhaili, Prophet Musa's request to Khidr represents a request to acquire beneficial knowledge and righteous deeds, expressed in a gentle and respectful manner. This illustrates that seeking knowledge is something that is commanded and requires a process of guidance in acquiring knowledge (Koya & Rafeeq, 2025; Permana et al., 2025; Romadhoni, 2022; Azizeh, 2019).

In Law Number 20 of 2003 concerning the National Education System, Chapter I, Article 1, Paragraph 1, education is defined as a conscious and planned effort to create a learning atmosphere and learning process in which students actively develop their potential to possess spiritual and religious strength, self-control, personality, intelligence, noble character, and the skills required by themselves, society, the nation, and the state (Sahriah et al., 2026; Bassar & Hasanah, 2020; Utami et al., 202). Education is an effort undertaken to enable individuals to develop their potential through guidance, teaching, and training directed toward achieving educational objectives. Achieving these educational objectives requires learning (Rahman et al., 2022; Bulungo, 2023). Learning is a process of interaction between students, educators, and learning resources within a learning environment, resulting in

changes in an individual's behavior toward a better direction (Salsabila et al., 2024; Azani et al., 2024). In the context of learning, the primary purpose of teaching is to facilitate students' learning; therefore, education must design responsive and student-centered learning experiences so that students' interest and social activities continue to increase (Putri et al., 2025; Fachreza et al., 2023; Kurniawan et al., 2018).

One form of learning that can realize these objectives is mathematics education. Mathematics is a means or method of thinking and reasoning, a symbolic language that can be understood by all culturally developed nations, and a means that can be used to find solutions to problems closely related to everyday life (Kurniawati et al., 2025; Mytra et al., 2023). Mathematics learning is a process designed to create an environmental atmosphere that enables students to engage in mathematical learning activities so that mathematical concepts or principles can be properly understood by students. Conceptual understanding is an essential component that must be present in mathematics learning (Rahmah et al., 2020; Sugiarti et al., 2024). When equipped with good conceptual understanding, students are able to explain or define learning material even when their explanation differs from the concept initially presented, as long as it conveys the same meaning. Conceptual understanding refers to students' ability to represent learning material in an easily understandable form, interpret data, and apply concepts in accordance with the knowledge they possess (Rival & Rahmat, 2023; Siregar, 2021; Rusdi et al., 2019).

The problem of students' understanding of mathematical concepts was identified among Grade X students at SMKN 1 Tebo, particularly in the topic of Systems of Linear Equations in Two Variables (SPLDV). Based on an analysis of students' Mathematics Final Examination answer sheets using indicators of conceptual understanding, several students were still unable to fulfill several indicators of conceptual understanding. In questions measuring the ability to use, utilize, and select particular procedures or operations in accordance with the properties of operations, students obtained a score of 1 because they did not use the appropriate procedures and operations. Similarly, in questions measuring the ability to apply concepts or algorithms in problem-solving, students also obtained a score of 1, indicating that they had not yet been able to appropriately apply the procedures for solving SPLDV problems, resulting in answers that were not accurate.

The analysis of the Final Examination scores of Grade X students at SMKN 1 Tebo in the 2020/2021 Academic Year, adjusted according to the indicators of conceptual

understanding, showed that most students obtained scores below 55. Based on the interpretation of conceptual understanding ability proposed by Mawaddah et al., scores below 55 fall into the low and very low categories. This condition indicates that students' mathematical conceptual understanding requires further attention. One factor suspected of contributing to this condition is that the teaching materials used in the learning process are still primarily limited to textbooks. The textbooks used do not adequately facilitate students in developing understanding through contextual problems. The material is presented without beginning with contextual problems that are closely related to students' daily lives, making the learning process less meaningful and causing students to experience difficulties in understanding mathematical concepts. Concepts presented in their final form also tend to encourage students to memorize formulas without developing a deeper understanding of the concepts being taught.

These problems were further confirmed by observations conducted by the researcher from July 20 to September 25, 2021. Mathematics instruction, particularly in Grade X at SMKN 1 Tebo, was still predominantly conducted in a one-way manner and remained teacher-centered. The teacher presented the material and subsequently provided several examples of questions, resulting in limited student participation during the learning process. When the teacher asked questions, students showed limited responses, and unless they were specifically called upon, they tended to remain silent. The implementation of mathematics learning methods was also insufficiently varied, particularly methods that connected mathematical concepts with students' everyday lives. Consequently, students became bored and perceived mathematics as merely involving the manipulation of symbols. Interviews with the Mathematics teacher at SMKN 1 Tebo, Mrs. Merry Syukria, S.Pd., revealed that some students considered mathematics a difficult subject to understand. Students tended to simply accept what was provided by the teacher, showed limited participation in the learning process, were unable to solve relatively challenging problems, and tended to memorize formulas rather than understand mathematical concepts. Students also continued to experience difficulties in dealing with abstract concepts and applying mathematics to real-life situations.

Interviews with several students also indicated that mathematics learning at the school continued to rely on textbooks as the primary teaching materials, while learning modules had not been specifically utilized in the instructional process. This condition made it difficult for students to engage in independent learning. This was evident from the

assignments given by the teacher, which students still found difficult to complete properly. Students also perceived mathematics as a difficult and boring subject. Therefore, there is a need for teaching materials that can assist students in learning independently while simultaneously connecting mathematical content with problems that are closely related to their daily lives. The problems identified in this study include mathematics learning that remains teacher-centered, students' difficulties in understanding abstract mathematical concepts, limited student activity and initiative in independent learning, one-way learning processes, teachers' difficulties in finding learning resources that support mathematics instruction, and teaching materials that have not yet been developed based on a realistic mathematics approach and therefore have not optimally supported students' mathematical conceptual understanding.

One effort that can be undertaken to address these problems is the development of teaching materials in the form of learning modules. Teaching materials facilitate students in learning more easily, while for teachers, they provide support in implementing the learning process. A module is a printed teaching material designed to enable learners to study independently. Modules can be used as independent learning media because they contain learning instructions that enable students to learn on their own without direct assistance from the teacher. Modules contain systematically organized materials and are designed to be as attractive as possible to stimulate students' interest in learning. The primary objective of module-based learning is to improve the efficiency and effectiveness of learning in schools in terms of time, financial resources, facilities, and human resources, thereby enabling the achievement of learning objectives optimally.

The use of the module is integrated with the Realistic Mathematics Education (RME) approach. According to the sources used in this study, RME is an approach that positions students' realities and experiences as the starting point of learning. The word "real" in "realistic" refers to something that is real or meaningful to students. In RME, learning begins with something real, enabling students to engage meaningfully in the learning process. The teacher acts as a guide and facilitator in the process of reconstructing mathematical ideas and concepts, while students are given opportunities to discover mathematical concepts themselves under the teacher's guidance. Therefore, concepts in RME are not presented in a ready-made form. Learning that begins with contextual problems or simple examples that are closely related to students' lives is expected to enable students to understand the material

more easily, become interested in solving problems using their own approaches, actively participate in the learning process, and avoid learning experiences that are overly abstract.

Previous studies included in this research indicate that the development of mathematics modules has been conducted using various approaches and covering different types of materials. The study by Siti Maslina, entitled "Pengembangan Modul Berbasis Pemecahan Masalah untuk Materi Matriks pada Pembelajaran Matematika Kelas X di SMK Muhammadiyah Bukittinggi," employed a problem-solving approach, whereas the present study employs the Realistic Mathematics Education approach. The study by Debbie Cynthia Erdy, entitled "Pengembangan Modul Materi Lingkaran Berbasis Pendekatan Open Ended di Kelas VIII MTsN Matur," employed an Open-Ended approach, whereas the present study employs the RME approach. Meanwhile, the study by Suci Fitriani, entitled "Pengembangan Modul Matematika pada Materi Perbandingan di Kelas VII SMPN 5 Bukittinggi," developed a mathematics module on ratio for Grade VII students at the junior secondary school level, whereas the present study develops a module on the topic of Systems of Linear Equations in Two Variables (SPLDV) for Grade X students at a vocational high school. Thus, the research gap lies in the application of the RME approach in developing a module for SPLDV material for Grade X vocational high school students, particularly at SMKN 1 Tebo.

The novelty of this study lies in the development of a mathematics learning module based on the Realistic Mathematics Education approach, specifically designed to improve the mathematical conceptual understanding of Grade X students at SMKN 1 Tebo in the topic of Systems of Linear Equations in Two Variables. The module is designed by considering the stages of RME and the characteristics of students' conceptual understanding. All activity units, ranging from learning materials to assignments, utilize contexts that are closely related to students' everyday lives, thereby making the material easier for students to understand. The module contains activities involving understanding contextual problems, explaining contextual problems, solving contextual problems, comparing and discussing answers, and drawing conclusions. The module materials cover conceptual understanding of SPLDV, formulating SPLDV from contextual problems, determining solutions to SPLDV, and solving SPLDV-related problems.

Based on these problems, this study focuses on the development of a mathematics learning module based on the Realistic Mathematics Education approach to support students' mathematical conceptual understanding of Systems of Linear Equations in Two

Variables in Grade X at SMKN 1 Tebo. The development of the module is directed toward producing teaching materials that can be used by students for independent learning and that can assist students in understanding concepts through contextual problems closely related to their everyday lives. The development focus also includes testing the module in terms of validity, practicality, and effectiveness. The research problem is how to develop a mathematics learning module based on the Realistic Mathematics Education approach for Systems of Linear Equations in Two Variables to improve the mathematical conceptual understanding of Grade X students at SMKN 1 Tebo, such that the module is valid, practical, and effective. Accordingly, the objective of this study is to develop a mathematics module based on the Realistic Mathematics Education approach to improve students' mathematical conceptual understanding, with the module meeting the criteria of validity, practicality, and effectiveness.

METHODS

This study employed a Research and Development (R&D) approach aimed at developing a mathematics learning module based on the Realistic Mathematics Education (RME) approach to support the mathematical conceptual understanding of Grade X students at SMKN 1 Tebo. The developed product was a mathematics learning module based on the RME approach for the topic of Systems of Linear Equations in Two Variables (SPLDV). The research development procedure adopted the development model proposed by Sugiyono, which generally consists of ten stages: identifying potentials and problems, collecting information, designing the product, validating the design, revising the design, conducting product trials, revising the product, conducting product-use trials, revising the product, and producing the final product. However, due to limitations in time, human resources, and funding, this study was limited to the first six stages: potentials and problems, information gathering, product design, design validation, design revision, and product trials.

The first stage involved identifying potentials and problems through a needs analysis conducted by interviewing the mathematics teacher at SMKN 1 Tebo. The analysis revealed that classroom learning tended to be one-directional and teacher-centered, while an RME-based module had not yet been available. Information was subsequently collected through observations and interviews with teachers and students concerning the teaching materials used and the learning process in the classroom. Based on the information obtained, the

researcher designed a mathematics learning module based on the RME approach by selecting SPLDV as the learning material. The module was developed according to the learning time available at the school and was intended for Grade X students. After the initial design was completed and revised based on the supervisor's recommendations, the product was submitted for expert validation.

The participants in the product trial were students of Grade X.B Accounting at SMKN 1 Tebo. The product trial was conducted on December 6, 8, and 12, 2022. During the trial, students used the RME-based module in the learning process, and learning activities were conducted in small groups consisting of four to five students. The product trial was intended to determine the practicality and effectiveness of the developed mathematics learning module. The design validation involved five validators, consisting of two mathematics education lecturers, one education lecturer, one informatics lecturer, and one Indonesian language lecturer.

The research instruments consisted of a product validation sheet, a practicality questionnaire, and a mathematical conceptual understanding test. The product validation sheet was used to assess the validity of the developed module based on expert judgments. The validation instrument employed a five-point scale consisting of very good, good, fair, poor, and very poor, with scores of 5, 4, 3, 2, and 1, respectively. The practicality questionnaire was administered to students after using the module to obtain their responses concerning the practicality of the developed product. The questionnaire used four response categories: strongly agree, agree, disagree, and strongly disagree, with scores of 4, 3, 2, and 1, respectively. The questionnaire included aspects related to independent learning, variation in learning resources, learning pace, connections between the material and students' everyday lives, clarity of instructions and materials, module design, learning motivation, and the enjoyment of the learning process.

The validity and reliability of the research instruments were examined through expert validation and item analysis. The conceptual understanding test was first validated by the validators and subsequently piloted in Grade X.A Accounting at SMKN 1 Tebo. The test trial was conducted to determine item validity, reliability, difficulty level, and discrimination power. The results showed that the seven test items could be used, with a reliability coefficient of 0.794. The item validity coefficients ranged from 0.6597 to 0.8170, while all seven items met the criteria for use. The validation of the module itself was conducted by

analyzing all aspects assessed by the validators, while its practicality was determined from students' responses after using the module.

The data were analyzed using descriptive analysis techniques. Product validity was determined by calculating the percentage of the scores assigned by the validators relative to the maximum possible score and interpreting the resulting percentage according to the established validity criteria. Practicality was analyzed based on students' responses to the questionnaire by comparing the total score obtained with the maximum possible score. The module was considered practical according to the predetermined practicality criteria. Meanwhile, the effectiveness of the module was determined from students' mathematical conceptual understanding test results after they had used the RME-based module. The module was considered effective when the percentage of students' conceptual understanding test results reached the predetermined good category, namely 60%–80%, with mastery determined based on a score above the minimum mastery criterion (KKM) of 69.

The research was conducted at SMKN 1 Tebo, with the product trial involving Grade X.B Accounting students in December 2022. During the implementation of the trial, the researcher also recorded the strengths and weaknesses of the module through field notes. The research activities involved teachers and students in the observation, interview, validation, questionnaire, and testing processes according to the requirements of each development stage. Based on these procedures, the study was directed toward producing a mathematics learning module based on the Realistic Mathematics Education approach that met the criteria of validity, practicality, and effectiveness in supporting students' mathematical conceptual understanding. The resulting module achieved a validity level of 87.84% (very valid), a practicality level of 81.76% (practical), and an effectiveness level of 81.48% (very effective).

RESULTS

The data obtained from the analysis of the learning module validation sheet are presented below. In general, the results of the module validation are shown in Table

Table 1. Validation Results of the Module Based on the Realistic Mathematics Education (RME) Approach

No.	Aspect	Total Score	Skor Maks	%	Criteria
1	Module Material Aspect	243	280	86,78	Very Valid

2	Presentation Aspect	604	680	88,82	Very Valid
3	Language and Readability Aspect	172	200	86,00	Very Valid
Total		1019	1160	87,84	Very Valid

Table 1 shows that the validation results of the module for each aspect ranged from 85% to 100%. Overall, the module was categorized as very valid, with a percentage of 87.84%, and was revised according to the suggestions provided by the validators. Thus, based on the percentage obtained, the developed module can be used in the learning process. The categorization of the module validity results was based on Riduwan's criteria presented in Table 3.8 on page 78.

After the module design had been revised according to the suggestions provided by the validators and supervisors, a product trial was conducted. The revised module was tested in one class at SMKN 1 Tebo, namely Grade X.A Accounting.

During the product trial, the learning process was conducted by the researcher in accordance with the Lesson Plan (RPP) that had been designed and developed by the researcher based on the existing syllabus.

Table 2. Schedule of Product Trial Implementation

Meeting	Day/Date	Period
1	Tuesday / December 6, 2022	3-4
2	Thursday / December 8, 2022	3-4
3	Tuesday / December 12, 2022	3-4

During the learning process using the mathematics module, students worked in small groups, with each group consisting of four or five students. The product trial was conducted to determine the results of developing a mathematics learning module based on the Realistic Mathematics Education (RME) approach in terms of its practicality and effectiveness.

Table 3. Results of the Student Response Questionnaire

No.	Indicator	Practicality Score	Criteria
1	Usefulness	82,64 %	Very Practical
2	Ease of Use	78,70%	Praktis
3	Attractiveness	83,95%	Very Practical
Overall Practicality Score		81,76%	Very Practical

Table 3 shows that the students' assessment during the learning process using the RME-based module on the topic of Systems of Linear Equations in Two Variables obtained an overall score of 81.76%, with the criterion of very practical. According to the students, the module was very practical to use in the learning process. The attractive design and colors of the module increased students' enthusiasm for learning and facilitated their understanding of the concepts presented in the developed RME-based module.

Table 4 Final Conceptual Understanding Test Results

Class	Number of Students	≥70		<70	
		Number	%	Number	%
X.B Accounting	27	22	81,48%	5	18,52%

Table 4 shows that 22 students obtained conceptual understanding scores greater than or equal to 70, representing 81.48% of the students, whereas 5 students obtained scores below 70, representing 18.52%. These results indicate that the majority of students demonstrated good conceptual understanding after using the learning module based on the RME approach. Therefore, the developed module can be used in the learning process to support students' conceptual understanding.

The constraints encountered during the teaching process at the initial stage of implementing the learning module based on the Realistic Mathematics Education (RME) approach were that students had some difficulty understanding the module and required considerable time to study it, while the available learning time was limited. There were also groups that experienced difficulties in solving the assigned problems, requiring the teacher to provide additional assistance to the groups experiencing difficulties. Consequently, other groups could not be observed comprehensively, and the classroom became relatively noisy during the learning process.

DISCUSSION

The results of the study demonstrate that the mathematics learning module based on the Realistic Mathematics Education (RME) approach developed for Grade X students at SMKN 1 Tebo fulfilled the criteria of validity, practicality, and effectiveness. The validation results obtained an overall percentage of 87.84%, which was categorized as very valid. The assessment covered three aspects, namely the material aspect with a percentage of 86.78%, the presentation aspect with 88.82%, and the language and readability aspect with 86.00%.

These results indicate that the developed module was appropriate in terms of its content, presentation, language, and readability. The module was also revised according to the suggestions provided by the validators before being implemented in the product trial. Therefore, the validation results indicate that the module had fulfilled the requirements for use as a mathematics learning resource.

The validity of the developed module is closely related to the characteristics of the RME approach applied in its development. The module does not present mathematical concepts directly in their final form but begins with contextual problems that are close to students' everyday experiences. Through these problems, students are encouraged to understand the situation, explain the problem, develop their own solutions, compare and discuss their answers, and subsequently draw conclusions. This learning process provides students with opportunities to reconstruct mathematical ideas under the guidance of the teacher. In this context, the teacher functions as a facilitator who assists students in developing their mathematical thinking, while students are actively involved in constructing their own understanding. Thus, the validity results indicate that the developed module is consistent with the principles of RME, particularly the use of meaningful contexts and students' active involvement in constructing mathematical concepts.

The practicality results show that the developed module obtained an overall percentage of 81.76%, categorized as very practical. The usefulness aspect obtained 82.64%, the ease-of-use aspect obtained 78.70%, and the attractiveness aspect obtained 83.95%. These results indicate that students considered the module useful, relatively easy to use, and attractive during the learning process. The attractiveness of the module, particularly its design and colors, encouraged students to become more enthusiastic about learning and facilitated their understanding of the mathematical concepts presented. In addition, the use of contextual material allowed students to relate the mathematical concepts in the module to situations encountered in everyday life. Therefore, the practicality findings demonstrate that the module was not only theoretically appropriate but also functional when implemented in the classroom.

The practicality of the module was also supported by the learning activities conducted in small groups consisting of four or five students. Group learning provided opportunities for students to discuss the contextual problems presented in the module, compare their answers, and communicate their understanding with other students. This learning process is

consistent with the RME approach, which emphasizes students' interaction and active participation in constructing mathematical knowledge. The finding is also in accordance with previous research on student-centered learning, which emphasizes the importance of providing students with opportunities to actively participate in the learning process rather than merely receiving information from the teacher. Thus, the positive student responses indicate that the RME-based module can facilitate a more active and meaningful learning process.

The effectiveness results further show that the developed module was able to support students' mathematical conceptual understanding. Of the 27 students who participated in the final conceptual understanding test, 22 students (81.48%) obtained scores of at least 70, while 5 students (18.52%) obtained scores below 70. These findings indicate that the majority of students demonstrated good conceptual understanding after using the RME-based module. The effectiveness of the module can be understood from its contextual learning characteristics. By beginning with problems that are close to students' daily lives, students are provided with opportunities to understand the meaning of mathematical concepts before working with formal mathematical representations. In learning SPLDV, contextual problems can help students identify known and unknown quantities, formulate mathematical relationships, determine solutions, and interpret the obtained solutions. Consequently, the learning process becomes less abstract and provides students with a more meaningful basis for understanding SPLDV concepts.

The findings of this study are consistent with the theoretical principles underlying RME and with previous research on student-centered mathematics learning. RME emphasizes realistic or meaningful contexts as the starting point for learning, while students are given opportunities to rediscover mathematical concepts through guided activities. Previous studies on the development of mathematics modules have also demonstrated that modules can be developed using various approaches, including problem-solving and Open-Ended approaches. However, the present study differs in terms of the learning approach and material developed. This study specifically integrates the RME approach into a mathematics module for Systems of Linear Equations in Two Variables (SPLDV) and is directed toward supporting students' conceptual understanding at the vocational high school level, particularly at SMKN 1 Tebo. Therefore, the findings provide additional evidence regarding the application of RME as a basis for developing contextual mathematics teaching materials.

This study implies that a mathematics learning module based on the Realistic Mathematics Education (RME) approach can serve as an alternative teaching resource for supporting students' mathematical conceptual understanding, particularly in Systems of Linear Equations in Two Variables (SPLDV). The module provides contextual learning activities that encourage students to actively construct concepts, discuss solutions, and relate mathematical ideas to everyday situations. Therefore, the developed module can support teachers in implementing more meaningful and student-centered mathematics learning while also providing students with opportunities for more independent learning.

This study has several limitations. The development process was limited to six stages of the Sugiyono development model due to constraints of time, resources, and cost, and the product trial was conducted in a limited setting involving Grade X students at SMKN 1 Tebo. In addition, some students initially experienced difficulties in understanding the RME-based learning activities and required considerable time and teacher assistance, while the effectiveness test did not involve a comparison group. Therefore, the findings should be interpreted within the context of the study, and further research involving broader samples and comparative testing is needed.

CONCLUSION

The results of this study indicate that the mathematics learning module based on the Realistic Mathematics Education (RME) approach for the topic of Systems of Linear Equations in Two Variables (SPLDV) for Grade X students at SMKN 1 Tebo was successfully developed and met the criteria of validity, practicality, and effectiveness. The validation results showed an overall percentage of 87.84%, categorized as very valid. The practicality assessment based on students' responses obtained a percentage of 81.76%, categorized as very practical. Meanwhile, the effectiveness results showed that 22 out of 27 students (81.48%) achieved scores of at least 70, indicating that the majority of students demonstrated good mathematical conceptual understanding after using the developed module. Therefore, the developed RME-based mathematics learning module can be used as a learning resource to support students' conceptual understanding of SPLDV.

This study contributes to mathematics education by demonstrating the development of a Realistic Mathematics Education (RME)-based mathematics learning module for Systems of Linear Equations in Two Variables (SPLDV) that meets the criteria of validity,

practicality, and effectiveness. The module provides an alternative contextual learning resource that supports students in developing mathematical conceptual understanding through problems related to their everyday experiences.

For practice, teachers are recommended to use the developed RME-based module as an alternative learning resource while providing adequate guidance and sufficient learning time. For future research, broader trials involving different schools and student characteristics are recommended, as well as further development and testing of the module to strengthen its applicability in wider learning contexts.

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