

E-Module Development of Line and Angle Materials Assisted by Learning Videos for Junior High School Students

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ABSTRACT

This study aimed to develop an E-Module on Line and Angle material with learning videos to facilitate the mathematical understanding ability of seventh-grade junior high school students that meets the aspects of validity and practicality requirements. This study was a research and development method with a 4D development model consisting of the define, design, develop, and disseminate stages. The small group trial subjects were nine students of grade VII at a Junior High School in Pekanbaru. The data collection instrument in this study consisted of a validity instrument in the form of a validation sheet and a practical instrument in the form of a student response questionnaire sheet. Based on the analysis of the validation sheet data and student response questionnaire sheets, the average E-Module validation was 3.6 with a very valid category, and the E-Module practicality average was 3.3 with a very practical category. Thus, it can be concluded that the developed E-Module is valid and practical.

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1. INTRODUCTION

All parts of life in Indonesia have been affected by the Covid-19 pandemic, but education has been hit the hardest. So, the Indonesian Minister of Education and Culture put out Circular Letter Number 4 of 2020, which is a circular letter about school policies about learning that can be done from home to make online or distance learning more meaningful. Pakpahan and Fitriani (2020) say that the goal of online learning is to meet educational standards through the use of information technology. This is done by connecting students and teachers through computers and other devices so that the teaching and learning process can still be done properly. Every subject, especially math, has to use technology. Zainal, Jasriani, and Hasnah (2019) say that mathematics is one of the subjects taught in school that affects how well people understand science and technology. In order to solve problems and use what

they've learned in the real world, math students must first understand the concepts (Nirmala Yulianty, 2019). In other words, students need to be able to understand math in order to be able to learn it.

Mathematical understanding ability is a key aspect that students must have. This is in line with Widyastuti (2015) that mathematical understanding ability is one of the important goals in learning mathematics because mathematical understanding ability means that the material taught to students is not just memorization but a concept of the material being studied. The indicators of mathematical understanding ability put forward by Hendriana et al. (2017) consist of: 1) restate a concept; 2) classify objects based on certain properties in accordance with the concepts; 3) apply concepts algorithmically; 4) present concepts in various forms of mathematical representation, and 5) link various concepts (internal and external mathematics). Hendriana et al. (2017) also said that mathematical understanding ability is included in the basic ability that will support other mathematical abilities. Students can't develop other mathematical abilities, such as reasoning skills if they do not understand the material being studied. Therefore, teachers need to check students' mathematical understanding ability before continuing the material because the material in mathematics is interrelated between one material and the next material.

Students' low mathematical understanding ability can be seen from the results of the 2019 national exam. The average value of the national exam for junior high school students in mathematics subjects, especially in Pekanbaru city is 51.34 (out of a maximum score of 100) and is included in the deficient category. This score is still below the minimum completeness value determined, which is 55.00. This makes mathematics the lowest score of all subjects: 1) numbers; 2) algebra; 3) geometry and measurement; and 4) statistics and probability. The geometry and measurement material is one of the materials that obtained the lowest percentage of correct answers.

Senjaya, Sudirman, and Supriyatno (2017) report that many students struggle with line and angle content due to issues like inaccurately writing mathematical symbols (mathematical language), not understanding the specified problems, and not grasping the fundamentals of arithmetic operations. Students have trouble grasping the properties of angles, according to Nurfadilah and Suhendar (2018), who also claim that students struggle with problem-solving on material that involves a visualising process, especially line and angle information. They don't understand the notion even when asked to visualise it. As a result, pupils end up with a diminished grasp of the subject matter. Materials involving lines and angles, in other words, call for advanced mathematical knowledge on the part of pupils.

Mathematical literacy can be fostered with the use of instructional resources that explicitly target this goal. Learning resources that emphasise the development of mathematical comprehension abilities might help students build their own mathematical conceptions in light of what they've learned. In the classroom, an E-Module (Electronic Module) is a computerised presentation of a lesson plan that encourages student participation. According to Simarmata et al. (2017), an E-Module is a sequential and structured presentation of electronic educational materials beginning with the smallest unit of the learning process. There are many benefits for both students and instructors when course materials are delivered in the form of an electronic module. Laili (2019) lists several benefits of using an E-Module, including the fact that it can be accessed from any computer or smartphone, less paper is used throughout the teaching and learning process, the E-Module is not the time or location-specific, and it features text, images, animations, and videos. Therefore, E-Module offers several benefits that facilitate their use.

The E-Module developed by researchers is in the form of E-Modules assisted by learning videos. According to Wibowo (2018), learning videos are teaching materials in the form of audiovisuals so that they can display the material studied as a whole so that at the end of each video viewing, students can master one or more basic competencies. In line with that, Wahyudi et al. (2013) argue that the advantages of learning videos include : (1) the ability to improve perception; (2) the ability to improve understanding; (3) the ability to improve learning transfer; (4) the ability to provide reinforcement or knowledge of the results achieved; (5) the ability to improve memory. In other words, E-Modulde assisted by learning videos are able to facilitate students' audio-visual so that students can master the material.

Learning strategies that can actively interest pupils are also required, in addition to using appropriate instructional resources. The scientific method is one way that can help pupils better grasp mathematics. Yanti (2019) argues that the scientific method improves the educational process by allowing students to interact directly with intended learning resources to acquire and hone knowledge, thinking, and psychomotor skills. Aldeliana (2019) found that the E-Module he helped create using Sigil to teach trigonometry was rated highly by pupils for its practicability and novelty. In addition, Wicaksono et al. (2020), who created an E-Module with the ADDIE approach and used PowerPoint as a medium, successfully increased students' motivation to learn and comprehension of mathematical ideas. While the research was conducted using theoretical methods, the E-Module was created utilising the Flip Pdf Professional application due of its simplicity and usefulness. Since audio-visual learning is more effective in boosting students' mathematical knowledge thanks to its many benefits, the produced E-Module makes use of learning movies per subject area.

Based on the description above, a study was conducted to develop a mathematics E-Module assisted by learning videos online and angle material to facilitate the mathematical understanding skills of seventh-grade junior high school students that meet the aspects of validity and practicality.

2. METHODS

This research is classified as development research or Research and Development (R&D), which is important research in an effort to find solutions to learning problems with certain products (Tegeh dan Kirna, 2013). The development model used in this study is the 4D (four-D). The 4D development research model consists of four stages, namely : define, design, develop, and disseminate (Thiagarajan dalam Trianto ,2015).

The define stage includes preliminary analysis, student analysis, task analysis, and learning objectives analysis. The preliminary analysis was carried out in several stages, namely interviews and literature studies. The interview was conducted with the mathematics teacher of SMPN 40 Pekanbaru as a resource person. The literature study used was sourced from journals. After the preliminary analysis, then the student analysis was carried out by means of literature study and observation at SMPN 40 Pekanbaru. Observation is done by observing the learning process of students and teachers in the classroom. After student analysis has been carried out, then task analysis is carried out in the form of competencies that will developed in learning activities such as analysis of Basic Competencies related to line and angle material. Based on concept analysis and task analysis, learning objectives are compiled in accordance with the Basic Competencies for each material specified in the E-Module development.

The design stage includes the preparation of instruments, media selection, format selection, and making initial product designs. The instruments prepared in the study were in the form of E-Module validation sheets and student response questionnaires. After the instrument has been made, media selection is carried out, namely electronic media in the form of the Flip Pdf Professional application. Furthermore, format selection is carried out with the aim of designing the contents of the E-Module both in terms of writing, images, and appearance. And the last step in the design stage is to make an initial product design which is then consulted with the supervisor.

The development stage includes making products developed based on the initial design of the product, conducting validity tests on the product, and conducting practical. E-Module development is carried out in accordance with the design and then consulted with the supervisor to get suggestions and input to be better until the E-Module is ready to proceed to the validation process. After that, the E-Module was validated by three validator lecturers until it was declared valid. Simultaneously or after conducting validation in the expert assessment process, a one-on-one evaluation was conducted with students.

The dissemination stage includes the distribution of research products that have been produced. The valid mathematics E-Module were packaged in web form and then disseminated to the school where the research took place. The E-Module trial was conducted at SMP Negeri 40 Pekanbaru in the odd semester of the 2021/2022 academic year. This study's subjects were nine SMP Negeri 40 Pekanbaru students with heterogeneous ability levels (low, medium, and high). This study's data collection instruments consisted of validity and practicality instruments for the developed E-Modules.

The validity instrument in this study was a validation sheet used to validate the E-Module, which was filled in by the validator. The validators consisted of three Mathematic Education lecturers. The aspects assessed on the validation sheet consisted of aspects of the E-Module cover and introduction, aspects of the E-Module content, aspects of the suitability of the E-Module to facilitate mathematical understanding skills, aspects of conformity with didactical requirements, aspects of conformity with construction requirements, and aspects of conformity with technical requirements. The instrument of practicality in this study is in the form of a student response questionnaire to determine the practicality of using E-Module. The student response questionnaire consisted of 17 close-ended questions. Student response questionnaires were distributed via a link after students worked on activities in the E-Module. The aspects of assessment in the student response questionnaire are E-Module display aspect, E-Module content/material aspect, E-Module ease of use aspect, learning video aspect, and software engineering aspect. The analysis technique used in the student response questionnaire is based on Anas Sudjono, 2011. The validity and practicality criteria used are based on Sugiyono (2014), which can be seen in table 1 and table 2.

Table 1. Criteria for E-Module Validity

Interval	Category
$3,25 \leq \bar{M}_V < 4$	Very Valid
$2,50 \leq \bar{M}_V < 3,25$	Valid
$1,75 \leq \bar{M}_V < 2,50$	Less Valid
$1,00 \leq \bar{M}_V < 1,75$	Invalid

Description :

\bar{M}_V : average total validity

Table 2. Criteria for Practicality of E-Module

Interval	Category
$3,25 \leq \bar{M}_p < 4$	Very Practical
$2,50 \leq \bar{M}_p < 3,25$	Practical
$1,75 \leq \bar{M}_p < 2,50$	Less Practical
$1,00 \leq \bar{M}_p < 1,75$	Not practical

Description :

\bar{M}_p : average total practicality

E-Module are categorized as valid and practical if they reach a minimum average score of 2.50.

3. FINDING AND DISCUSSION

This study aims to see whether the developed E-Module meets the criteria of validity and practicality. This research was conducted through four stages, namely the defining stage, the design stage, the development stage, and the dissemination stage. The following are the results at each stage :

1. Define Stage

The defining stage includes five steps, namely initial and final analysis, student analysis, concept analysis, task analysis, and formulation of learning objectives. The initial and final analysis was carried out with the aim of knowing whether or not the E-Module needed to be developed. The preliminary analysis was carried out in several stages: interviews and literature studies. Based on the results of interviews conducted with two junior high school mathematics teachers in Pekanbaru and literature studies derived from journals obtained that teachers do not make E-Module because it is not a necessity. The teaching materials used by teachers are books from the government, which are still difficult for students to understand because they are not in accordance with students' cognitive abilities.

Student analysis aims to find background information on the knowledge and abilities of seventh-grade students at junior high school in Pekanbaru participating in the learning process. Student analysis was conducted by literature study and classroom observation. Based on the results of the literature study, it was found that students in grade VII of junior high school aged 12-14 years old entered the formal operational stage, namely being able to work effectively and innovatively, analyze in combination, think proportionally, and draw conclusions fundamentally (Piaget in Leny Marinda, 2020). So, not all junior high school students are at the formal operational stage of development. There are still students who find it difficult to accept an abstract idea if it is not described concretely. Based on observations in the classroom, the learning process is still teacher-centred, and students have difficulty when asked to solve story problems because they can't apply formulas in solving problems.

Concept analysis was conducted by examining the context and order of presentation of material in the student book of Mathematics grade VII Junior High School Curriculum 2013 by the Ministry of Education and Culture revised edition 2017 related to line and angle material. A concept map of line and angle material was produced in the concept analysis step.

Task analysis is carried out to analyze tasks in the form of competencies that will be developed in the learning activities, such as analysis of Basic Competencies related to line and angle material. In the task analysis step, the resulting Competency Achievement Indicators based on the Basic Competencies used are KD 3.10, analyzing the relationship between angles as a result of two parallel lines cut by a transverse line and KD 4.10, solving problems related to the relationship between angles as a result of two parallel lines cut by a transverse line. The resulting GPA will be used as a reference for making E-Modules.

Based on concept analysis and task analysis, learning objectives are formulated in accordance with the Basic Competencies for each material set as a consideration in the development of E-Modules.

2. Design Stage

At the design stage, the initial E-Module design, media selection, format selection, E-Module validation questionnaire sheet and student response questionnaire sheet were produced. The E-Module developed uses the arrangement of E-Module components in the Practical Guide for E-Module Preparation according to Permendikbud in 2017 with the constituent components, namely: 1) E-Module cover includes E-Module title, subject name, learning topics/materials, class and author; 2) introduction, includes a table of contents, glossary, KD and GPA, a brief description of the material, motivation, prerequisite material, and instructions for using E-Modules; 3) learning, includes learning activity 1, objectives, material description, summary, tasks, exercises, self-assessment, learning activity 2 and so on following the number of lessons designed; 4) evaluation; 5) answer key and scoring guidelines; 6) bibliography; 7) attachments.

The components of the E-Module that were developed were modified according to the scientific approach and the needs of students, so several components were not used, namely glossary, motivation, prerequisite material, self-assessment, evaluation and scoring guidelines. The components of the developed E-Module consist of 4 parts, namely: 1) E-Module cover, including E-Module title, subject name, learning topics/materials, class and author; 2) introduction, including preface, table of contents, introduction to the material, basic competencies, indicators of competency achievement, and concept map; 3) content of learning materials, including learning objectives, learning activities consisting of observing activities, questioning activities, information gathering activities, reasoning activities, and communicating activities, learning videos, and exercises; and 4) closing, including summary, competency test, answer key and bibliography.

The preparation of the validation questionnaire sheet to assess the quality of the developed E-Module consist of 6 aspects, namely aspects of the E-Module cover and introduction, aspects of E-Module content, aspects of E-Module suitability for facilitating mathematical understanding skills, aspects of conformity with didactical requirements, aspects of conformity with construction requirements, and aspects of conformity with technical requirements. The preparation of the student response questionnaire sheet refers to 5 aspects, namely the display aspect of the E-Module, the content/material aspect of the E-Module's ease of use aspect, the learning video aspect, and the software engineering aspect.

3. Development Stage

At the development stage, the E-Module was produced in accordance with the initial design that had been made at the design stage. Each sub-learning material contains learning activities with a scientific approach and learning videos. The learning video is made by recording it using the Prezi Video application. Learning videos contain recordings of researchers explaining line and angle material. The learning video is divided into 3 videos according to the 3 sub-materials in the E-Module. The following is the appearance of the developed E-Module.

KEGIATAN BELAJAR 2
(KB-2)

SUDUT

Tujuan pembelajaran pada kegiatan belajar II ini yaitu :

1. Siswa dapat mendefinisikan sudut.
2. Siswa dapat menentukan besar sudut dari kedudukan angka jarum jam yang diberikan.
3. Siswa dapat menentukan besar sudut menggunakan busur derajat.
4. Siswa dapat menjelaskan jenis-jenis sudut yaitu sudut lancip, sudut siku-siku, sudut tumpul dan sudut lurus.
5. Siswa dapat menentukan hubungan antara dua sudut yaitu sudut berpenyiku, sudut berpelurus dan sudut bertolak belakang.

Figure 1. Learning Activity 2

Mari Mengamati

Amatilah Gambar 2.5 berikut ini.

Gambar 2.5 Contoh sudut dalam kehidupan nyata

Kita dapat mengamati sudut yang ada pada benda-benda nyata seperti yang ditemukan pada penggaris segitiga, jendela, kursi santai dan tali tambang. Sudut yang terbentuk pada gambar tersebut ditunjukkan dengan dua sinar garis yang berpotong di satu titik. Besar sudut pada gambar tersebut berbeda satu sama lain. Amatilah lingkungan sekitarmu dan temukan benda yang menggunakan konsep sudut. Apa sajakah yang kamu temukan? Apakah besar sudut pada masing-masing sudut yang kamu temukan berbeda-beda?

Mari Menanya

Setelah kegiatan mengamati, buatlah daftar pertanyaan tentang hal-hal yang belum kamu pahami mengenai sudut. Tuliskan pertanyaan kamu di buku latihan kamu masing-masing.

20

Untuk mengukur sudut PQR pada Gambar 2.10 dilakukan cara sebagai berikut:

1. Letakkan pusat busur derajat pada titik sudut, yaitu titik Q. Himpitkan garis horizontal busur derajat yang tertulis angka 0 pada salah satu kaki sudut, yaitu QR. Lakukanlah seperti pada Gambar 2.11.

Gambar 2.11 Pengukuran sudut PQR dengan busur derajat

2. Lihatlah angka pada busur derajat yang berimpit dengan kaki sudut yang lain, yaitu kaki sudut QP berimpit dengan garis yang menunjukkan angka 140. Jadi ukuran $\angle PQR$ pada Gambar 2.11 adalah 140° .

Selain dapat digunakan untuk mengukur besar sebuah sudut, busur derajat juga dapat digunakan untuk menggambar sebuah sudut. Berikut langkah-langkah menggambar sebuah sudut :

1. Gambarkan sebuah garis lurus yang akan menjadi garis acuan serta kaki sudut pertama.

25

Figure 2. One Example of Presentation of Learning Materials on E-Module



Figure 3. Video Display Learning in E-Module

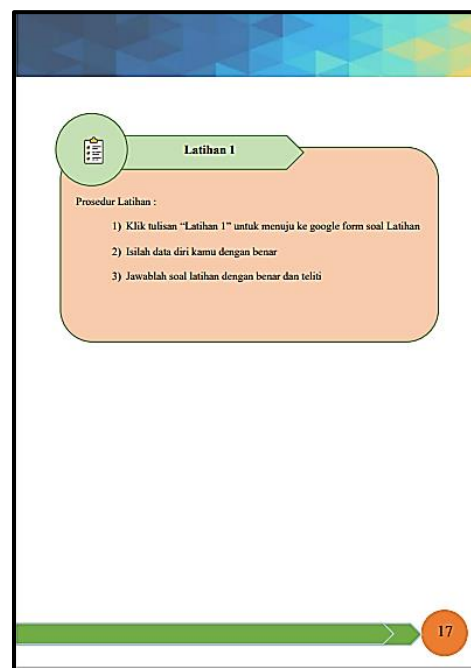


Figure 4. Exercise Display in E-Module

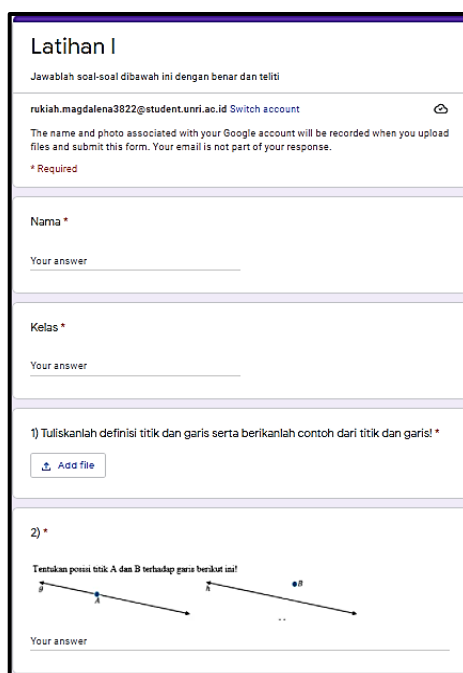


Figure 5. Display of Practice Questions on Google Form

The E-Module that has been made is then validated by three experts in the field of Mathematics Education. The three experts included two lecturers of Mathematics Education at Universitas Riau and one lecturer of Mathematics Education at UIN Suska Pekanbaru. Based on the validation results, the results are shown in Table 1.

Table 3. E-Module Validation Results

No	Assessed Aspect	Validator Score			Average Validation Score	Validation Category
		1	2	3		
1.	E-Module cover and introduction	4	4	4	4	Very Valid
2.	E-Module content	3,3	3,87	4	3,72	Very Valid
3.	Suitability of E-Module to facilitate mathematical understanding skills	3,4	4	3,6	3,6	Very Valid
4.	Conformity with didactical requirements	3,5	3,75	4	3,7	Very Valid
5.	Compliance with construction requirements	3,5	3,42	4	3,6	Very Valid
6.	Compliance with technical requirements	3,5	3,58	3,88	3,6	Very Valid
	Average	3,53	3,77	3,91	3,6	Very Valid

From Table 3, it can be seen that the average E-Module validation score is 3.6, with a very valid category. The average value on the aspect of the E-Module cover and introduction is 4 (very valid category). This shows that each component of the cover, which includes the E-Module title, subject name, learning topics/materials, class and author, as well as the introduction, which includes a preface, table of contents, introduction to the material, basic competencies, indicators of competency achievement, and concept maps are included in full. The average score on the content aspect of the E-Module is 3.72 (very valid category). This shows that the material is presented sequentially and systematically in the E-Module in accordance with KD 3.10 and 4.10. The average value on the aspect of suitability of E-Module to facilitate mathematical understanding skills is 3.6 (very valid category). This shows that E-Module is in accordance with the indicators of mathematical abilities that need to be achieved, namely 1) restating concepts; 2) classifying objects according to certain properties in accordance with the concept; 3) giving examples and non-examples of concepts; 4) presenting concepts in various forms of mathematical representation, and 5) applying concepts or algorithms to problem-solving. The average score on the aspect of conformity with didactical requirements is 3.7 (very valid category). This shows that the E-Module can be used well by students with high, medium and low abilities. The level of difficulty of the questions in the E-Module is in accordance with the level of thinking of junior high school students. Prioritizing the process of finding concepts and problems in the E-Module encourages students to learn independently. The average score on the aspect of conformity with construction requirements is 3.6 (very valid category). This shows that the E-Module has clear instructions for use, language appropriate for students' level of thinking, and language that does not contain misconceptions and contains clear learning objectives. The average score on the aspect of conformity with technical requirements is 3.6 (very valid category). This shows that the use of images, layouts, and videos is interesting, and the applications used in developing E-Module are easy to run on smartphones and computers. This means that the E-Module meets the criteria according to the aspects assessed and can be tested on students.

Although the E-Module is valid, there are some suggestions from the validators for the perfection of the developed E-Module.



Figure 6. Display of Learning Activity 1 Before Revision



Figure 7. Display of Learning Activity After Revision

Figure 6 is the display of learning activity 1 before revision. The validator suggested removing the word “kita” because the meaning of the word “kita” is that those who use the E-Module during learning are readers and people who develop E-Module. In reality, E-Module is independent teaching materials that students only use as readers. The validator also suggested not using the word “untuk” at the beginning of a sentence because the word “untuk” is a conjunction that functions as a link between sentences. If it functions as a connector, then the word “untuk” will not be able to function as an opening sentence prefix. The display of learning activity 1 after revision can be seen in Figure 7.

Hubungan Antar Sudut

Hubungan antar sudut terdiri dari sudut berpelurus, sudut berpenyiku dan sudut bertolak belakang.
Perhatikanlah gambar di bawah ini

Gambar 2.10 Denah rumah Salsa

Gambar di atas merupakan denah di sekitar rumah Salsa. Rumah Salsa berada di poros kompas (tengah). Suatu hari, Salsa mendapatkan tugas untuk membuat denah lingkungan sekitar rumahnya.

Figure 8. Display of Learning Activity 2 Before Revision

Aktivitas IV

Hubungan Antar Sudut

Hubungan antar sudut terdiri dari sudut berpelurus, sudut berpenyiku dan sudut bertolak belakang.
Perhatikanlah Gambar 2.15 berikut.

Gambar 2.15 Denah lingkungan sekitar Salsa

Figure 9. Display of Learning Activity 2 After Revision

Figure 8 is the display of learning activity 2 before revisions based on the validator’s suggestion. The validator suggested changing the objects that are likened to the points. In figure 8, the one that is likened to a point is the market. In reality, an object that can be likened to a point is a single object, while the market is a large place with many shops in it. So, the object that is likened to a point is changed such as from a market to a tree. Figure 9 is the display of learning activity 2 after being revised based on the validator’s suggestions.

The next step was to test the E-Module to junior high school students in grade VII through small group trials. The small group trial was conducted online with 9 seventh-grade students of SMPN 40 Pekanbaru. During the trial, students were asked to learn using the E-Module that had been made. After the trial was completed, students filled out a response questionnaire in the google form format that had been distributed. After students filled out the response questionnaire, the researcher analyzed the data from the student response questionnaire to see the E-Module's practicality level. The results obtained from the students response questionnaire are presented in Table 2.

Table 4. E-Module Practicality Results

No	Assessment Criteria	Average Student	
		Response Questionnaire	Criteria
		to E-Module	
1.	E-Module Display	3,3	Very Practical
2.	Contents/Materials on E-Module	3,3	Very Practical
3.	Ease of Use of E-Module	3,4	Very Practical
4.	Learning Video	3,3	Very Practical
5.	Software Engineering	3,2	Practical
	Average	3,3	Very Practical

Table 4 shows that the average value of the E-Module's practicality is 3.3, with a very practical category. The average value on the aspect of E-Module appearance is 3.3 (very practical category). This shows that the E-Module has an attractive appearance, the writing in the E-Module is clear and easy to read, the language used in the E-Module is easy to understand, the colour composition in the E-Module makes students more enthusiastic about learning, and the pictures in the E-Module are good and interesting. The average score on the content/material aspect of the E-Module is 3.3 (very practical category). This shows that the material presented in the E-Module helps students understand lines and angles and students are confident that they will succeed in doing exercises and competency tests. The average score on the ease of use aspect of the E-Module is 3.4 (very practical category). This shows that the instructions for using the E-Module are clear so that students can use the E-Module well. The average score on the learning video aspect is 3.3 (very practical category). This shows that the E-Module learning videos' appearance and sound are very clear, and the use of learning videos makes it easier for students to understand line and angle material. The average value in the software engineering aspect is 3.2 (practical category). This shows that the application (Flip Pdf Professional) used in the E-Module can be run by students easily both on smartphones and computers. This means that the E-Module is practical for use by students in grade VII.

Disseminate Stage

At this stage, the distribution is carried out at SMPN 40 Pekanbaru by sending the E-Module link through the WhatsApp group of class VII, and students can copy the link to one of the internet browser applications such as Google Chrome to be able to open the developed E-Module.

The advantages of the E-Module of mathematics assisted by learning videos with line and angle material developed are as follows:

1. Make it easier for teachers to deliver learning materials because this mathematics E-Module acts as a study guide for students so that they can learn independently in the classroom or outside of school hours.
2. This mathematics e-module is developed and packaged attractively so that the student learning process will be more enjoyable and can be understood by students.

3. The process of distributing E-Modules is very easy and efficient online by simply sharing a *website link*.

In addition to having advantages, this mathematics E-Module also has the following disadvantages:

1. The watermark in the mathematics E-Module could not be removed because the researcher needed to pay a lot of money to upgrade the application.
2. Mathematics e-modules cannot be accessed offline.

Based on the results of the description above, it is obtained that the E-Module assisted by a learning video to facilitate students' mathematical understanding skills is valid and practical to use. This is in line with the opinion of Bidayatun Nafi'ah dan Suparman (2019), Khoirul Anam Dwi Wicaksono et al. (2020) in their research related to E-Module using a scientific approach to facilitate students' mathematical understanding skills.

4. CONCLUSION

Conclusions drawn from the available shows that E-Modules of mathematics aided by learning videos to facilitate the mathematical understanding ability of junior high school students have reached very valid criteria with an average score of 3.6. E-Modules of mathematics aided by learning videos to facilitate the mathematical understanding skills of junior high school students have reached efficient criteria with an average score of 3.3. Based on the findings, researchers can advise those who would like to replicate the study. The study's limitations are the E-Modules developed here were only applicable to the line and angle materials. Then, the study's trials were limited to small groups due to time constraints. The E-Modules developed here should be tested on larger groups, and based on the validation results, the approach aspects of the mathematical understanding ability aspects of the E-Module should be revised.

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