

# Development of English for Mathematics E-Module based on Flipbook Maker

Sumardin Raupu<sup>1\*</sup>, and Dewi Furwana<sup>2</sup>

<sup>1</sup>Mathematics Education Program, Institut Agama Islam Negeri Palopo, South Sulawesi, Indonesia

<sup>2</sup>English Language Education Program, Institut Agama Islam Negeri Palopo, South Sulawesi Indonesia

**Abstract.** This research discusses the development of an English for mathematics e-module based on flipbook maker at Palopo State Islamic Institute. The purpose of this research is to produce an English for mathematics e-module product based on flipbook maker on basic mathematics material. This type of research is research and development (R&D) and applying 4D models (Define, Design, Develop, and Dessiminate). The results show that the final prototype of this development is an English for Mathematics e-module based on a flipbook maker in the form of an android application containing 14 materials accompanied by evaluation questions that can be used in the learning process at the Palopo State Islamic Institute. The feasibility of developing this E-Module is reviewed from the results of expert validation with a percentage of 87% of the category being very valid while in terms of practicality with a percentage of 89% of the category being very practical.

## 1 Introduction

A mathematics teacher, besides having to master mathematical material, of course, must also have good and correct communication skills, both orally and in writing in order to be able to compete in the global era. During the mathematics learning process is taking place in the classroom, in addition to a positive attitude and having good mathematical knowledge, the ability to reason and communicate are two aspects that greatly support the success of the learning process [1].

As the successor of the nation in the future, students are of course required to be able to communicate well and correctly not only using Indonesian but also using international languages. Therefore, at the Palopo State Islamic Institute, there is an English for Mathematics course. By taking this course, students are expected to be able to communicate mathematics in English both orally and in writing so that they can become professional mathematics teachers not only using Indonesian but also using English. However, the reality faced in the field, in following this course, students tend to be silent and seem afraid to speak in English [2].

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\* Corresponding author: [sumardin\\_aldehy@iainpalopo.ac.id](mailto:sumardin_aldehy@iainpalopo.ac.id)

Based on the results of interviews with students State Islamic Institute Palopo, they admitted to being afraid to present in English for fear of mispronunciation, and sentence tension. Besides, they also do not understand mathematical terms in English. This condition is further complicated by the lack of teaching materials owned by students. In this course, there are no relevant teaching materials that students can own and learn independently. Students are very dependent on lecturers so they do not have their own learning resources that can be studied every time. In accordance with the development of technology, students can use the internet easily wherever they are, so they feel the need to develop *decent e-module* teaching materials (valid, practical and effective) for this course so that students can access learning materials and learn them anytime and anywhere.

By seeing the usefulness of teaching materials, namely for lecturers and students, can add references to teaching materials in the Mathematics English course, and can improve students' ability to communicate using English in mathematics. Teaching materials should be designed to guide students to find ways to learn on their own. Furthermore, a teaching material should be designed and written with instructional methods because it will be by lecturers to help and support the learning process [3]. Karnes and Bean stated that the content of teaching materials for students must be adjusted to the student's ability level [4]. Further, materials must provide advanced content that is interdisciplinary in nature, time-effective, complex, relevant and meaningful, matching the required knowledge and skills. Widodo, S. Chomsin, and Jasmadi provide several things that must be considered in making teaching materials that are able to make students learn independently and obtain completeness in the learning process, namely: (1) providing interesting examples and illustrations in order to support the presentation of the material; (2) provide the possibility for students to provide feedback or measure their mastery of the material provided by providing practice questions, assignments and the like; (3) contextual, namely the material presented related to the atmosphere or context of the task and the student's environment; (4) The language used is quite simple because students only deal with teaching materials when studying independently [5]. The quality of good teaching materials can be seen from 3 criteria, namely validity, practicality and effectiveness [6]. The 4-D development model used for the development of teaching materials consists of 4 main stages, namely: (1) *Define*, (2) *Design*, (3) *Develop*, and (4) *Disseminate*.

Based on the description above, the problems that exist in Mathematics English lectures are that students are afraid of Mathematics English courses, students have a vocabulary that is lacking in mathematical terms in English, students cannot communicate well in English, students do not have teaching materials that are worth studying every time, and learning English mathematics is very dependent on lecturers.

## 2 Method

Figures and tables, as originals of good quality and well contrasted, are to be in their final form, ready for reproduction, pasted in the appropriate place in the text. Try to ensure that the size of the text in your figures is approximately the same size as the main text (10 point). Try to ensure that lines are no thinner than 0.25 point.

This type of research is research and development (R & D), which aims to produce products in the form of English for mathematics e-modules based on flipbook makers. The model in this study uses a 4D development design which includes the stages of *Define*, *Design*, *Develop*, and *Disseminate*. The *Define* stage consists of an analysis stage that must be carried out in order to analyze the needs in the development process of the English for Mathematics E-Module based on the Flipbook Maker and collect information related to the product to be developed. The *Design* stage aims to design a prototype of teaching materials to be developed. The *develop* stage is the stage to produce development products that are

carried out through several stages. The Disseminate stage is the dissemination stage to promote the results of development to be accepted by individual users or groups.

The material in the development of the English for mathematics e-module is basic mathematical material. The test subjects in this study were 25 Palopo State Islamic Institute students. Data collection instruments used in product trials developed in the form of validity, and practicality test questionnaires. The validity questionnaire sheet is filled in by the validator and the practicality test is filled in by the student, a Likert scale used four intervals, namely, a score of 4 means very good, a score of 3 means good, a score of 2 means less good, a score of 1 means very less good. The results of the validity questionnaire obtained are then calculated using the formula as equation (1):

$$percentage = \frac{score\ obtained}{maximum\ score} \times 100\% \tag{1}$$

The results of the percentage validity of the e-module are then interpreted according to table 1 below:

**Table 1.** Categories of Assessment of the Validity of a Product [7]

| Percentage (%) | Category     |
|----------------|--------------|
| 0 – 20         | Invalid      |
| 21 – 40        | Less Valid   |
| 41 – 60        | Fairly Valid |
| 61 – 80        | Valid        |
| 81 – 100       | Very Valid   |

The results of the practicality questionnaire obtained are then calculated using the formula as equation (2):

$$Percentage = \frac{score\ obtained}{maximum\ score} \times 100\% \tag{2}$$

Based on the percentage results then categorized according to the following table 2:

**Table 2.** Categories of Practicality Assessment of a Product [8]

| Percentage (%) | Category             |
|----------------|----------------------|
| 0 – 20         | Impractical (IP)     |
| 21 – 40        | Less Practical (LP)  |
| 41 – 60        | Quite Practical (QP) |
| 61 – 80        | Practical (P)        |
| 81 – 100       | Very Practical (VP)  |

### 3 Result And Discussion

#### 3.1 Description of Final Product Prototype

Based on the development process at the define, design, and develop stages, a prototype or initial product display is produced. The prototype or display of the English for Mathematics E-Module based on the Flipbook Maker developed consists of several parts, namely the front cover, preface, table of contents, words of wisdom, material, bibliography, and back cover. The cover is the front part of the e-module, the cover page contains the background related to the material and the title of the e-module as well as the name of the compiler. The cover of the e-module can be seen in figure 1(a). The preface contains the author's expression of gratitude, gratitude and wishes to all those who helped in the development of the e-module. Display of the preface in figure 1(b). The table of contents is used to make it

easier for readers to see the page they are looking for. The table of contents also contains components that are e-modules. The table of contents display can be seen in figure 1(c). Words of wisdom contain words from several figures that can motivate readers. The display of bija words can be seen in figure 2(a). The material contains an explanation of basic mathematics. The display of the material can be seen in figure 2(b). Bibliography is a list that contains references that are used as reference sources to write the contents of e-modules. The view of the Bibliography can be seen in figure 2(c). The back cover of the e-module becomes the closing part of the product development results. The back cover can be seen in figure 2(d). The following is the final view of the prototype of the English for Mathematics E-Module development product based on Flipbook Maker:

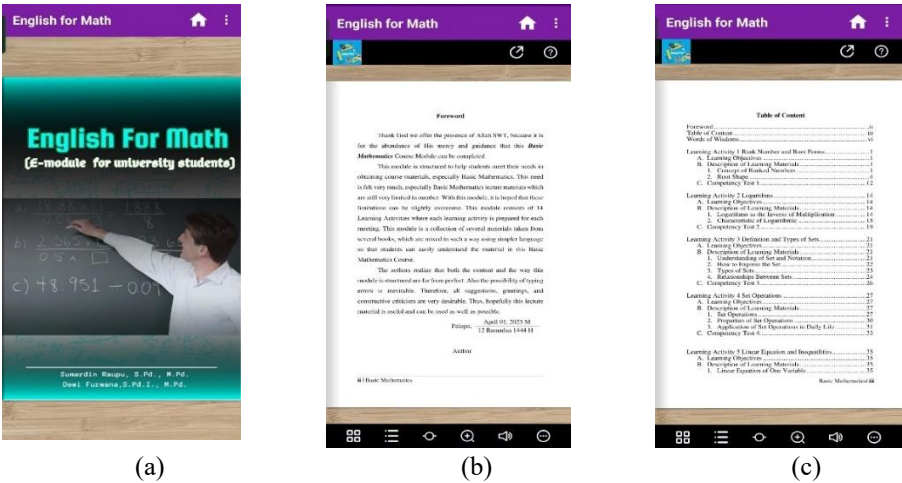


Fig. 1. (a) Cover, (b) preface, (c) table of contents

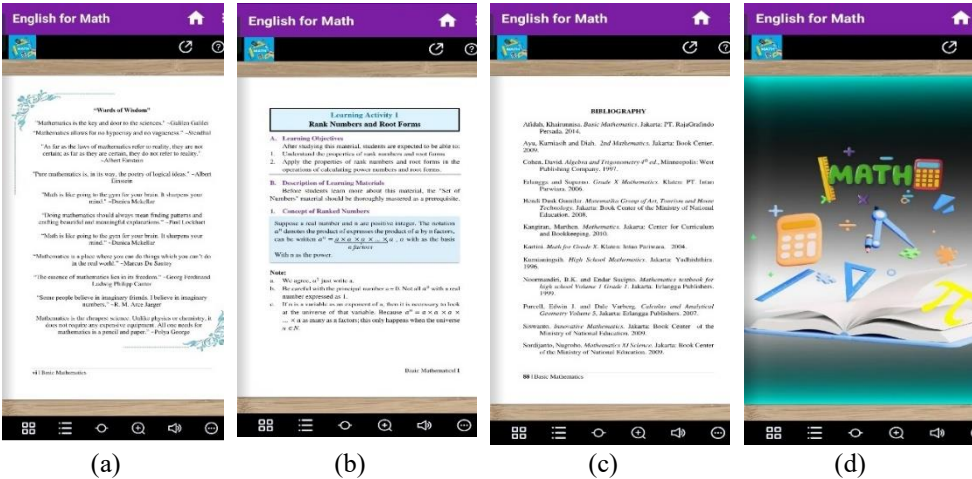


Fig. 2. (a) Words of wisdom, (b) materials, (c) bibliography, (d) back cover

3.2 Eligibility of English for Mathematics E-Module Based on Flipbook Maker

3.2.1 Expert Validation

Linguist validation is carried out by one expert. The e-module assessment covers grammatical correctness and punctuation, fluency and clarity, readability and layout, and stylistic consistency. Linguist validation is done once. From the results of linguist validation, a percentage of 88% was obtained with a very valid language category. Material expert validation was carried out by one expert, The e-module assessment includes the feasibility of content, and the feasibility of presentation. Linguist validation is done once. From the validation results from material expert validators, a percentage of 85% was obtained with the category of very valid material. Media expert validation was carried out by one expert. The e-module assessment covers media display, media functions and benefits. Media expert validation is carried out once. From the validation results from media expert validators, a percentage of 88% was obtained with the category of very valid material. The results of this validation are in line with the validation carried out The title is the development of SCROM-based English mathematics teaching materials through E-Learning with a percentage of validation results of 78% and valid categories [9].

3.2.2 Practicality of E-Modules

After the product is declared valid, then the product will be seen again for practicality. To see the practicality of the product, a practicality test was carried out. The trial was conducted by giving questionnaires to 25 IAIN Palopo students. The results of product practicality trials from the 25 students are as follows:

Table 3. Product Practicality Results

| No | Student Code | Assessed aspects |   |   |   |   |   |   |   |   |    |
|----|--------------|------------------|---|---|---|---|---|---|---|---|----|
|    |              | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1  | 1A           | 3                | 4 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 4  |
| 2  | 2A           | 4                | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 3  |
| 3  | 3A           | 4                | 3 | 4 | 4 | 3 | 4 | 3 | 4 | 3 | 4  |
| 4  | 4A           | 3                | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4  |
| 5  | 5A           | 4                | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 4  |
| 6  | 1B           | 4                | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4  |
| 7  | 2B           | 3                | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 3 | 4  |
| 8  | 3B           | 4                | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 4  |
| 9  | 4B           | 4                | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4  |
| 10 | 5B           | 4                | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4  |
| 11 | 1C           | 4                | 4 | 2 | 4 | 3 | 4 | 3 | 4 | 4 | 2  |
| 12 | 2C           | 3                | 3 | 3 | 2 | 4 | 4 | 4 | 3 | 3 | 2  |
| 13 | 3C           | 3                | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4  |
| 14 | 4C           | 3                | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 3  |
| 15 | 5C           | 3                | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 3  |
| 16 | 1D           | 2                | 4 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 4  |
| 17 | 2D           | 2                | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | 4  |
| 18 | .3D          | 2                | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 3  |

|               |    |     |                     |     |     |     |     |     |     |     |     |
|---------------|----|-----|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 19            | 4D | 4   | 4                   | 4   | 4   | 3   | 3   | 4   | 4   | 4   | 4   |
| 20            | 5D | 3   | 4                   | 4   | 3   | 4   | 3   | 4   | 3   | 4   | 4   |
| 21            | 1E | 4   | 4                   | 3   | 4   | 3   | 4   | 4   | 4   | 4   | 3   |
| 22            | 2E | 4   | 3                   | 4   | 4   | 3   | 4   | 3   | 4   | 3   | 4   |
| 23            | 3E | 4   | 3                   | 4   | 3   | 4   | 3   | 4   | 4   | 3   | 4   |
| 24            | 4E | 4   | 4                   | 4   | 3   | 4   | 3   | 4   | 4   | 4   | 4   |
| 25            | 5E | 4   | 3                   | 4   | 3   | 4   | 4   | 3   | 4   | 3   | 4   |
| Sum           |    | 86  | 89                  | 93  | 85  | 89  | 85  | 90  | 93  | 89  | 91  |
| Maximum Score |    | 100 | 100                 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| %             |    | 86  | 89                  | 93  | 85  | 89  | 85  | 90  | 93  | 89  | 91  |
| Category      |    | VP  | VP                  | VP  | VP  | VP  | VP  | VP  | VP  | VP  | VP  |
| Average %     |    | 89  | Very Practical (VP) |     |     |     |     |     |     |     |     |

Based on the results of the questionnaire of students' responses to the ease of using the English for Mathematics e-module based on flipbook makers, an average practical percentage of 89% was obtained with a very practical category. The results of the student response questionnaire show that the use of e-modules in learning is easy to understand, interesting, and motivating to learn English mathematics.

The results of this study are in line with the research conducted by Meiyana Putri and Iwan Junaedi entitled "Development of Ethnomathematics-Based E-Module Using the Inquiry Learning Model to Improve Mathematical Problem Solving Ability" with an average practical percentage of 87.33% in the very practical category [10].

4 Conclusion

Based on the results of research that has been conducted on the development of English for Mathematics E-Module based on Flipbook Maker at Palopo State Islamic Institute, the following conclusions were obtained:

1. The final prototype of development with a 4-D development model (Define, Design, Develop, and Disseminate) produces an English for Mathematics E-Module based on a Flipbook Maker which consists of activities equipped with evaluation questions that can be used in the learning process at the Palopo State Islamic Institute.
2. The feasibility of developing the English for Mathematics E-Module based on the Flipbook Maker at the Palopo State Islamic Institute is reviewed from the results of expert validation with an average percentage of 87% in the very valid category and practicality product with an average percentage of 89% in very practical category.

References

1. F. Shadiq, Komunikasi dalam Pembelajaran Matematika, **34**, 1–23 (2015)

2. B. N. Z. Hulaifah, Bul. Jagaddhita, **1**, 4 (2019)

3. I. Lestari, Pengembangan Bahan Ajar Berbasis Kompetensi sesuai dengan Kurikulum Tingkat Satuan Pendidikan (Akademia Permata, Padang, 2013)

4. F. A. Karnes and S. M. Bean, Methods and Materials for teaching the gifted. (Routhledge, New York, 2021)

5. S. C. Widodo and Jasmadi, Panduan menyusun bahan ajar berbasis kompetensi, (Elex Media Komputindo, Jakarta, 2008)

6. J. Akker, R. M. Branch, K. Gustafson, N. Nieveen, and T. Plomp, *Design Approaches and Tools in Education and Training*. Netherlands: Springer Netherlands, 1999.

7. M. Agung and F. Eliza, MSI Trans. Educ, **2**, 78–84 (2021).
8. Riduwan, *Belajar Mudah Penelitian*. (Alfabeta, Jakarta, 2005)
9. S. W. Palupi and S. C. Ningsih, 553–560, 2017
10. M. Putri and I. Junaedi, Unnes J. Math. Educ., **11**, 174–182 (2022).