

# Development of a flipbook-based Javanese language teaching e-module to improve student learning outcomes

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**Abstract:** This research produces teaching material products in the form of electronic modules (e-modules) in class IV. The focus of the research discussed in this study is to: (1) Know the design of e-module development products to improve learning outcomes for class IV Javanese language subjects, (2) Find out the validity of e-modules to improve learning outcomes for class IV Javanese language subjects in the city Malang, and (3) Knowing the effectiveness of learning outcomes for class IV Javanese language subjects. This research uses the Research and Development (R&D) research method, referring to the ADDIE development model with stages including Analysis, Design, Development, Implementation and Evaluation. The result of this research is a Javanese e-module consisting of 33 pages. This e-module has validity from design experts of 85%, material experts of 85% and language experts of 93%. The results of the field test on the use of e-modules taken from the results of the fourth grade student questionnaire were 86.66%. Meanwhile, testing the effectiveness of the Javanese e-module on the learning outcomes of class IV students showed positive results. In terms of learning material, the results before using the e-module were 67.19 in the pre-test and increased after using the e-module in the post-test results to 81.19. The development of this e-module will later be useful for learning Javanese at primary level schools/madrasas, which of course this development can continue to be carried out to improve students' abilities and also teachers' abilities in terms of developing teaching materials.

**Keywords:** e-module; flipbook; learning outcomes

## 1. Introduction

Javanese language learning in elementary schools/madrasah ibtidaiyah currently still uses conventional teaching materials, namely printed books. This is not in line with the implementation of an independent curriculum, where the learning process must more or less involve technology which is part of the learning process. must based on TPACK (Technological Pedagogical Content Knowledge) so that learning tools which in the independent curriculum are called teaching modules must be transformed from conventional printed form to electronic modules (e-modules). In developing teaching modules into e-modules in implementing an independent curriculum, elementary schools/madrasah ibtidaiyah must have the courage to innovate, be creative and make breakthroughs in managing education, creating a conducive learning environment so that teachers and students are passionate about learning. Teachers and students have the widest opportunity to be creative and innovate so that the quality of learning increases. One of the breakthroughs in improving Javanese language learning is by developing it. The teaching module is in the form of an electronic module or electronic module which is better known as an e-module. E-module is a module in electronic form which can be accessed and used with the help of electronic devices such as computers, laptops, tablets or smartphones. The application that can be used is the flipbook application, where the teaching module is a flipbook-based e-module in the form of a digital book which is capable of presenting interesting material, not only pictures and

writing but also videos. , and when used it is not erased like when using gadgets in general. However, it can be opened like opening a regular printed book because it is equipped with this feature.

Flipbooks are digital book technology or three-dimensional e-books that people like because they present interesting elements such as videos that can be accessed with one click. Flipbooks are electronic books that can be used in learning in the current era where everything can be accessed easily thanks to advances in the internet in the 5.0 era. Flipbook itself is an application used to create word document layouts which are converted into PDF files which are then inserted into ready-to-use e-book documents (Marizal & Asri, 2022). Flipbook media itself has its own advantages because it can contain a combination of text, animation, video, sound, and is also able to contain sound slide media which is a type of audio-visual media (Sari & Ahmad, 2021). Apart from that, flipbook is also an application known as professional software in the form of a PDF which is then converted into a flash book, where this software is in the form of a 3-dimensional flip-flop book equipped with HTML5 which contains several features such as Power Point, Excel, etc. This application can be used as a model in the form of digital books, catalogues, magazines and so on (Afandi et al., 2023).

One of the innovations that technology offers to the world of education is the application of electronic books (e-books). The implementation of e-books, which means books are displayed electronically rather than printed, e-books are becoming popular and are starting to attract the attention of a new generation of teachers. E-books offer lots of images and sounds besides writing because they use technology. E-book applications offer people access to books in any environment at any time. Because new books are published, many people need more and the problem is time and shipping costs, for this reason e-booking makes it easy for book lovers and those who want to access (Ulker et al., 2021).

Language learning Javanese used in madrasas/schools is a model main pedagogy genre. The genre pedagogy learning model is a learning model with text understanding as a two-layer model that underlies the design of text-based teaching models. This model emphasizes that texts are units of meaning designed to achieve certain social goals and cannot be separated from its social context. As a text-oriented teaching methodology, there are two basic principles of this pedagogy, namely the knowledge genre and the curriculum genre. Genre knowledge is concerned with identifying the main genres or types of texts used as material for teaching purposes. To support this learning model, the flipbook teaching e-module is expected to be able to improve learning outcomes and also achieve the goals of learning Javanese in elementary schools. So, in implementing this flipbook application in making Javanese language teaching e-modules, there are several things that must be prepared apart from choosing the application that will be used later. This preparation includes planning teaching materials which includes media selection, format selection, and initial planning. After that, teaching materials are made that are tailored to the needs and then the evaluation stage will determine whether the e-module in the form of a flipbook is suitable for use or not, which can later be revised after carrying out experiments and improvements (Thahir et al., 2022).

In preparing e-learning modules in the independent curriculum, it must be adapted to the principles of preparing teaching modules which are determined by a) Learning is designed taking into account the students' current stage of development and level of achievement, in accordance with their various needs and characteristics, so that learning becomes meaningful and enjoyable, b) Learning is designed and implemented to build capacity to become lifelong learners, c) The learning process supports the holistic development of students' competence and character, d) Relevant learning, namely learning that is designed according to the context, environment and culture of students, and involves people parents and the

community as partners, and e) Learning oriented towards a sustainable future. (Ministry of Education, Culture, Research and Technology of the Republic of Indonesia, 2022).

In general, teaching modules have minimum component requirements in accordance with the Learning and Assessment Guidelines, including learning objectives, assessment plans at the beginning and end of learning, learning steps, and learning media. However, to support readability and ease of finding teaching modules for users, the teaching module consists of components including 1). General information that includes selection of unit type and level of education, phase and class selection, subject selection Special needs marker, title of teaching module, general description of the teaching module, identity of the module author (name and origin of organization), and cover image (optional). 2) Module objectives include selecting/uploading learning objective references which are used as a reference for preparing learning objectives for all course modules. 3). Usage Plan includes total allocation of class hours, Determination of learning mode, Target students, number of students, facilities and infrastructure, and competency requirements 4). Materials, Assessments and References are a complete module design following the minimum component requirements in the Learning and Assessment Guide. A complete teaching module must at least contain: learning objectives, assessment plan, activity details, and learning media. Material includes material title and activity summary, and assessment. If additional assessments/alternative assessments are still needed, contributors can upload them in the assessment column provided. 5). References can be optional, if other material references are still needed sourced from PMM and/or from other credible sources, then contributors can upload reference links in the reference column provided (Ministry of Education, Culture, Research and Technology of the Republic of Indonesia, 2022) .

The result of learning is a change in behavior from not knowing to knowing and understanding and becoming focused. The learning outcomes themselves appear in the aspects of knowledge, understanding, habits, skills, appreciation, emotions, social, physical, ethics or character, and attitudes. So if someone has experienced a learning process, the changes mentioned above will appear which are called learning outcomes (Afandi et al., 2013) . Meanwhile, Hamdani explained that learning outcomes are changes in behavior that students obtain after experiencing learning activities . Susanto stated that learning outcomes are the abilities that children gain after carrying out learning activities. Student learning outcomes are influenced by several factors , including internal factors and external factors (Sappaile et al., 2021) . According to Demirtas, learning outcomes will be seen from the knowledge, skills and behavior that students acquire in their learning/education environment. Apart from that, MH Cho and Shen explained that learning outcomes are the result of students' abilities and skills in organizing their learning activities (Yavuzalp & Bahcivan, 2021) .

Several studies that are relevant to the development of flipbook-based e-learning modules include research by Retno Juliani and Nini Ibrahim entitled The Influence of Flipbook Media on Indonesian Language Learning Outcomes for Class IV Elementary School Students showing test results of 0.05 so it can be concluded that this shows the influence of flipbook media. regarding the results of Indonesian language learning for class IV students (Juliani & Ibrahim, 2023) . Research using flipbook learning media to improve student activities and learning outcomes shows that the use of online- based flipbook learning media can improve learning outcomes and learning activities for class IV UPT SD Negeri 3 Tulungagung students on the theme 8 subthemes 1 and 3 learning 3 and 4. Improved learning outcomes can be seen through the results of learning evaluations at the end of the learning process. Before the action was taken, the average score for all students was 68.4 with learning completeness amounting to 39.4%. On cycles In cycle I the average score increased to 72.9 with a learning completion percentage of

66.6%, and in cycle II the average score increased again to 81.8 with a learning completion percentage of 81.8% (Setiadi et al., 2021).

From several studies above, it can be seen that the advantages of using teaching materials using the flipbook application can improve student learning outcomes. However, the disadvantages of using this flipbook application include that it depends on the power source. If the power source is dead then this learning media cannot be displayed to students, besides that it is also not suitable for long material because not all of the material can be presented. used. presented and will actually make it difficult for students to understand the material. And also the e-flipbook teaching module is only limited to individuals, and is not suitable for use in groups (Soleha, 2023).

To overcome the weaknesses of using flipbook e-modules, you can do this in several ways, such as using solar power because one of the sources with the fastest growth is solar energy, where in 2019 alone, this energy grew by 22%, which means an increase of 131 TW/hour compared to in 2018 (Arafet & Berlanga, 2021), to overcome energy source problems. Meanwhile, for students having difficulty understanding the material, this can be done by linking the YouTube link to the flipbook e-module. The YouTube application is an information source that contains a lot of information from various educational platforms and various knowledge (Alsabhan et al., 2024), so students can study the material in more depth by watching tutorials on YouTube. Especially for the current generation, acculturation with gadgets really helps them in learning. Learning using flipbook e-modules can also be used in groups because by studying in groups using e-modules they are able to develop meta-cognitive awareness and are better able to manage their own thinking and learning. They not only need to be involved in processes such as asking, paying attention, guessing, predicting, checking and reasoning, but also know that they are carrying out learning activities in a group (Green et al., 2012).

This research aims to provide a change in the teaching materials for Javanese language subjects which currently still use conventional teaching materials in the form of textbooks to become electronic modules that can be accessed wherever students are to learn. Apart from that, it encourages Javanese language subject teachers to be more innovative and creative in learning so that the class becomes interactive so that students become motivated to achieve the desired learning outcomes.

## 2. Materials and methods

### 2.1 Types of research

This research is research and development (R&D) research using the ADDIE research model. The ADDIE development research model is a model that involves model development stages with five steps/development stages including: Analysis, Design, Development or Production, Implementation or Delivery and Evaluation (Rusmayana, 2021). At the analysis stage, the researcher conducted a preliminary study and literature review of the object of study of the problems raised. The second stage is Design. This stage is a continuation of the previous stage, namely the researcher began to design what components were needed when preparing the e-module. Apart from the component design for the e-module, there is also a design regarding the principles of creating an e-module based on an independent curriculum. Apart from that, the researcher also created an instrument that will be used to assess the feasibility of the e-module to be completed. Stage 3 (development), after all the material has been analyzed, the e-module design has been created, and the instrument has been completed, at this development stage the previously created design is realized in original form or in the form of a design. The 4th stage is implementation (implementation) at the product stage that has been designed will be tested or implemented on a limited basis with several respondents in connection with the development of the flipbook- based e-module that has been created and obtain the

results of expert reviews and assessments. The 5th Stage (evaluation) is the final stage in design and development research.

In R&D research, apart from product development research, quantitative research is also carried out. Quantitative research according to Balaka (2022) argues that a quantitative approach is research based on the philosophy of positivism to research certain populations or samples and random sampling by collecting data using instruments, statistical data analysis. In principle, research is to answer problems. Problems are deviations from what should be with what actually happens. Quantitative research starts from a preliminary study of the object under study (preliminary study) to arrive at the problem through empirical facts. Furthermore, so that the problem can be answered well, a specific problem formulation is made and generally made in the form of a question sentence (Balaka, 2022). A quantitative approach was used to measure the level of feasibility of the flipbook e-module product and also to measure the relationship between the use of the flipbook e-module and student learning outcomes in Javanese language subjects that have used the independent curriculum.

### 2.2 Research Subjects and Objects

Research subjects refer to the individuals or groups who are the main focus of a study. In scientific research, research subjects often consist of samples drawn from a wider population (Geograph, 2024). The research subjects in this study were class IV students of one of the *madrasah ibtidaiyah* in the city of Malang. Students were chosen to be the subjects of this research because students are users of e-module products and their learning achievements will later be assessed after using e-modules. The object of this research is the appropriateness of the design, material and language used in the flipbook e-module as well as student learning outcomes after using the flipbook e-module in Javanese language subjects.

### 2.3 Data Types and Sources

The types of data used in this research are primary data and secondary data. Primary data consists of: validation results by validators and also data from student questionnaires regarding the assessment of the attractiveness of Javanese flipbook e-module products. Meanwhile, secondary data is in the form of reference books used by teachers and students during learning which will later be developed into a flipbook e-module.

### 2.4 Data collection techniques

The data collection instrument used in this research was to ask questions to expert validators and class IV students to obtain information related to product validation and attractiveness using a questionnaire. There are four questionnaires used by researchers in developing e-learning modules, including: (1) Validation evaluation questionnaire for teaching materials by expert validators of teaching materials; (2) Evaluation of material questionnaire validation is carried out by material expert validators; and 3) Student response questionnaire to assess the attractiveness of the media.

### 2.5 Data Analysis Techniques Data Analysis Techniques

The data analysis technique in this development research uses a Likert scale to determine the level of suitability of design, material and language as well as student responses. Before being analyzed using a Likert scale, the data was processed using a percentage formula. To analyze learning achievement data, a t-test was used using the results of the pre-test and post-test scores for each material per chapter.

### 3. Results

#### 3.1 Implementation of the ADDIE E-Module Java Flipbook Development Model

The results of developing Javanese flipbook e-module products using the ADDIE model are presented in the [Figure 1](#), [Figure 2](#), [Figure 3](#), [Figure 4](#), [Figure 5](#), [Figure 6](#), [Figure 7](#), [Figure 8](#), [Figure 9](#), [Figure 10](#), [Figure 11](#) and [Figure 12](#).

##### 1) Cover Page View

The salmon pink cover page is equipped with temple images and animations. The cover page layout using the Canva application is equipped with the title of the Javanese e-module and the name of the developer.



Figure 1. Flipbook e-module cover page

##### 2) Foreword View

The foreword features the developer's remarks as well as thanks. This display can be accessed or opened using the flipbook application on PC, laptop, computer and also cellphone devices.



Figure 2. Foreword page

### 3) Show Product Specifications

This display contains an overview of the flipbook e-module being developed and the information contained in the e-module starting from the material presented, paper size, and also the type of font used.



Figure 3. Product specifications page

4) Table of Contents View

The table of contents page displays all the features available in the e-flipbook module, starting from the cover page to the developer biography.

**DAFTAR ISI**

Halaman Sampul.....	i
Kata Pengantar .....	ii
Spesifikasi Produk .....	iii
Daftar Isi .....	iv
Capaian Pembelajaran .....	v
Petunjuk Penggunaan E-Modul .....	vi
<b>Bab 1 Menyimak.....</b>	<b>1</b>
Alur Pembelajaran .....	1
Materi Ajar .....	4
Gladi 1 .....	7
<b>Bab 2 Dialog/Podcast.....</b>	<b>9</b>
Alur Pembelajaran .....	9
Materi Ajar .....	12
Gladi 2 .....	16
<b>Bab 3 Menulis.....</b>	<b>17</b>
Alur Pembelajaran .....	17
Materi Ajar .....	21
Penilaian Pengetahuan .....	21
Kunci Jawaban .....	24
Glosarium .....	25
Daftar Pustaka .....	26
Biografi Penulis .....	27

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Figure 4. Table of Contents Page

5) Display of Learning Achievement

This display contains the learning outcomes that students will achieve based on the elements at stage B.

**CAPAIAN PEMBELAJARAN FASE B  
BERDASARKAN ELEMEN**

Elemen	Capaian Pembelajaran
Menyimak	Siswa mampu memahami teks narasi (dongeng anak) yang dibacakan atau dari media audio.
Membaca dan Meminta	Siswa mampu memahami pesan dan informasi tentang teks narasi dan media audio dan dialog/podcast.
Berbicara dan Mempresentasikan	Siswa mampu menjawab pertanyaan dengan menggunakan ungkapan bahasa pada sebuah dialog/podcast.
Menulis	Siswa mampu: a) menulis jawaban teks narasi; b) kalimat sederhana dalam aksara Jawa (simplifikasi steno).

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Figure 5. Learning Results Page

6) E-Module Instructions Display

The display on the instructions page for using the e-module is in the form of steps for using the e-flipbook module, while the media menu is in the form of features in the e-flipbook module.



Figure 6. E-Module Instructions Page

7) Display of General Information on E-Modules and Learning Materials per Chapter

The material display is divided into 3 chapters, namely listening material, dialogue/pacelathon, and writing. The listening material is equipped with an audio narrative text link, the dialogue material shows how to dialogue by paying attention to the uploaded language, and the writing material is presented with a YouTube tutorial which can be accessed directly.



Figure 7. General Information Page for E-Modules and Learning Material per chapter

### 8) Knowledge Assessment View

The knowledge assessment display in each chapter varies according to the material presented. The questions take various forms, multiple choice, dialogue/pacelathon completion, and Javanese script writing.

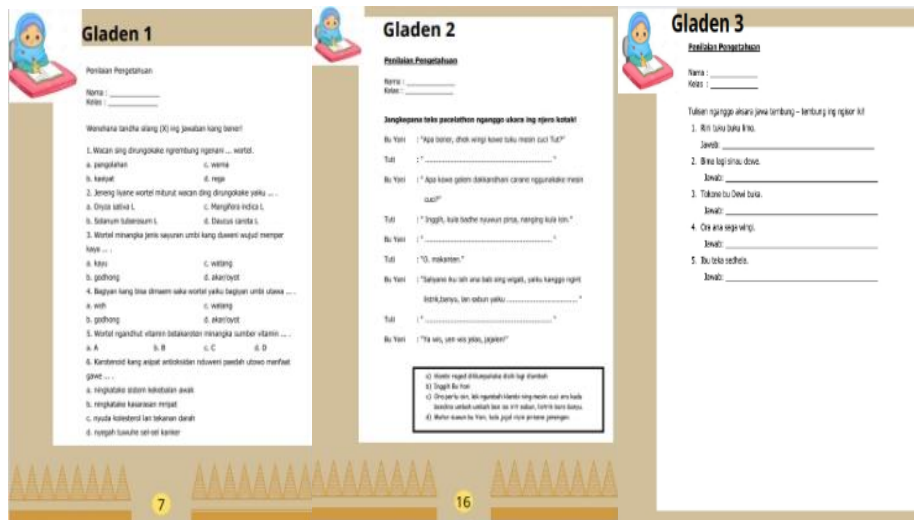


Figure 8. Knowledge Assessment Page

### 9) Answer Key Display

To complete the knowledge assessment questions in this flipbook e-module, it is also equipped with an answer key which can help teachers or students match answers after working on practice questions.

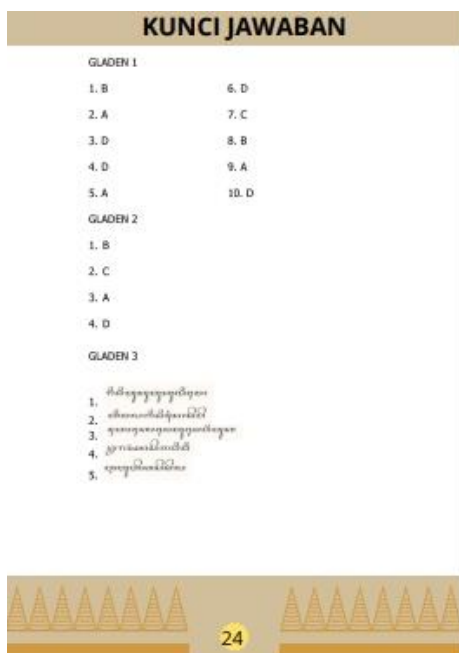


Figure 9. Answer Key Page

### 10) Glossary View

In the narrative text or dialogue/pacelathon material there are several words that students may not understand, so a glossary is included which translates the meaning of Javanese words into Indonesian.



Figure 10. Glossary page

### 11) Bibliography View

This display contains references for making Javanese flipbook e-modules both in books and online media.



Figure 11. Bibliography page

### 12) Author Biography View

This display explains the biodata of the e-flipbook module developer, which includes the name, educational background and other related information of the flipbook e-module developer.



Figure 12. Author biography page

Based on the results of the analysis of filling out validation instruments both in terms of design and language, as well as the results of student response questionnaires, the e-module is suitable for use in class IV Javanese language learning. The results of calculating the percentage of instrument and questionnaire validation are in [Table 1](#), [Table 2](#), [Table 3](#), and [Table 4](#).

Table 1. Results of Expert Validation Questionnaire Design

No	Rated aspect	Score
1.	Accurate font size (readable clearly)	3
2.	Accurate font selection (can be read clearly)	3
3.	Color composition of text against background	3
4.	The narrative displayed is easy to understand (clear)	3
5.	The effectiveness of animation/images in explaining the material	4
6.	E-module is easy to use	3
7.	The material is presented systematically	4
8.	Consistency of words, terms and sentences	3
9.	Layout consistency	4
10.	The table of contents format is easy for users to use	4
11.	Column width is easy to use	4
12.	The writing is easy to understand	3
13.	Video, audio and images according to the material	4
14.	Effective video, audio and image functions	3
15.	Videos, audio and images attract students' interest	3
	Total score	51
	Validity Percentage	85%

Table 2. Results of Material Expert Validation Questionnaire

No	Rated aspect	Score
1.	The learning objectives are in accordance with the learning outcomes in the elements of stage B	4
2.	The material is presented sequentially and coherently	4
3.	The material presented can be understood easily by students	4
4.	Illustrations are presented according to the material in the e-module	4
5.	The language used is easy for students to understand	4
6.	The material in <i>the flipbook e-module</i> is adjusted to the learning outcomes and learning objectives	3
7.	The material presented contains all learning outcomes and learning objectives	4

No	Rated aspect	Score
8.	The material in <i>the flipbook e-module</i> can be studied without the help of other media	3
9.	The material in <i>the flipbook e-module</i> is in accordance with developments in science and technology	4
10.	The material in <i>the flipbook e-module</i> can be studied anywhere and at any time	3
Total score		37
Validity Percentage		85%

Table 3. Material Expert Validation Questionnaire Results

No	Rated aspect	Score
1	Accuracy of sentence structure	4
2	Sentence effectiveness	4
3	Standardity of terms	3
4	Understand messages or information	4
5	Conformity of illustrations to the content of the text	4
6	Students can respond to the message or material presented	4
7	The language used can encourage students to think critically	3
8	The language used is appropriate to students' intellectual development	4
9	The language used is appropriate to the student's level of emotional development	4
10	Grammatical correctness	4
11	Spelling accuracy	4
12	The use of letters is proportional and easy to read	4
13	The use of sentences in the e-module is in accordance with the rules of Indonesian and Javanese	3
14	Consistency in use of terms	4
15	Consistent use of symbols or icons	3
Total score		56
Validity Percentage		93.33%

Table 4. Field Test Questionnaire Results

No	Rated aspect	Scores from 33 Students	Maximum Score	Percentage (in the %)
1.	I can easily understand the material if I use the Javanese <i>flipbook teaching e-module</i>	105	132	79.54
2.	I like the material in <i>the flipbook Javanese language teaching e-module</i>	120	132	90.90
3.	I can easily understand the language used in <i>the e-module</i>	104	132	78.78
4.	I can easily understand the content of the material in <i>the e-module</i>	107	132	81.06
5.	I like <i>flipbook teaching materials</i>	122	132	92.42
6.	I can read every word of the material in <i>the flipbook teaching e-module</i>	114	132	86.36
7.	I can easily understand the material presented by the teacher by using <i>the flipbook teaching e-module</i>	116	132	87.87
8.	I love <i>the flipbook teaching e-module format</i>	116	132	87.87
9.	I love the pictures and videos on <i>the flipbook teaching e-modules</i>	119	132	90.15
10.	I love using <i>flipbook teaching e-modules</i>	121	132	91.66
Total score		1,144	1,320	86.66
Validity Percentage				86.66%

From the data from the percentage analysis above, it can be seen that the Javanese language flipbook e-module is suitable for use as teaching material in class IV of the independent curriculum.

### 3.2 Effectiveness of flipbook e-module products on learning outcomes

Student learning outcomes when using the flipbook e-module can be seen from the results of giving pre-tests and post-tests on the material on the learning outcomes for each element. The [Table 5](#), [Table 6](#), and [Table 7](#) are the pre-test and post-test results for each material per chapter.

Table 5. Results of Pre-test and Post-test Listening Material

NO	Student's name	Pre-test Scores	Post-test scores
1	ANHF	70	90
2	AKP	70	80
3	AJB	70	80
4	ANA	70	90
5	AF	70	90
6	AP	60	70
7	AAM	60	70
8	AFP	70	90
9	AKN	70	90
10	ACR	70	90
11	C.A	60	80
12	INR	60	70
13	KRK	70	80
14	BPS	70	90
15	LSZ	70	90
16	MDA	60	80
17	POSSIBLE	70	90
18	MNA	60	70
19	DAMAGE	60	70
20	M.F	60	70
21	MGD	60	70
22	MRR	60	80
23	NAME	70	80
24	NIF	70	80
25	NSA	70	80
26	NRA	70	90
27	NZAN	70	80
28	SBA	70	80
29	AFV	80	100
30	SS	70	80
31	LEGITIMATE	70	80
32	UUS	70	90
	Amount	2150	2620
	Average	67.1875	81.875

Table 6. Pre-test and Post-test Results of Dialogue/Pacelathon Material

No	Student's name	Pre-test Scores	Post-test scores
1	ANHF	75	80
2	AKP	75	80
3	AJB	60	70
4	ANA	65	70
5	AF	80	90
6	AP	60	65
7	AAM	65	70
8	AFP	60	70
9	AKN	80	90
10	ACR	80	90
11	C.A	65	70
12	INR	60	70
13	KRK	60	75
14	BPS	65	75
15	LSZ	85	90
16	MDA	70	80
17	POSSIBLE	65	75
18	MNA	65	75
19	DAMAGE	60	70
20	M.F	85	95
21	MGD	60	70
22	MRR	60	70
23	NAME	70	80
24	NIF	60	70
25	NSA	85	90
26	NRA	80	90
27	NZAN	65	75
28	SBA	60	75
29	AFV	85	90
30	SS	80	90
31	LEGITIMATE	60	70
32	UUS	75	80
	Amount	2220	2500
	Average	69,375	78.125

Table 7. Pre-test and Post-test Results of Sandhangan Swara Writing Material

No	Student's name	Pre-test Scores	Post-test scores
1	ANHF	65	80
2	AKP	60	80
3	AJB	65	75
4	ANA	70	75
5	AF	70	90
6	AP	55	70
7	AAM	60	75
8	AFP	70	80
9	AKN	70	90
10	ACR	70	90
11	C.A	60	70
12	INR	60	70
13	KRK	70	75
14	BPS	70	75

No	Student's name	Pre-test Scores	Post-test scores
15	LSZ	70	90
16	MDA	60	80
17	POSSIBLE	70	75
18	MNA	60	75
19	DAMAGE	60	70
20	M.F	60	95
21	MGD	60	70
22	MRR	60	70
23	NAME	70	80
24	NIF	70	70
25	NSA	70	90
26	NRA	70	90
27	NZAN	70	75
28	SBA	70	75
29	AFV	75	90
30	SS	70	90
31	LEGITIMATE	70	70
32	UUS	70	80
	Amount	2120	2530
	Average	66.25	79.0625

From the [Table 5](#), [Table 6](#), and [Table 7](#), it can be seen that the pre-test and post-test results for each material chapter have increased. The effectiveness of the E-Module Product, the results of the pre-test and post-test data values above were tested using the t-test.

1. Listening material

Based on the [Table 8](#), it can be seen that the average pre-test score is 67.19 and the average post-test score is 81.88. It can be seen that there has been an increase of 14.68. The pre-test was carried out before learning using the flipbook e-module. Next determine the hypothesis with the results of the [Table 9](#).

Table 8. Paired Sample Statistics

		Group Statistics			
	Category	N	Means	Std. Deviation	Std. Meaning of Error
Results	Prates	32	67.1875	5.22671	.92396
	Posttest	32	81.8750	8.20602	1.45063

Table 9. Paired Sample Test

		Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference		
		F	Sig	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Results	Equal variances assumed	5.826	.019	-8.540	62	<.001	<.001	-14.68750	1.71990	-18.12552	-11.24948
	Equal variances not assumed			-8.540	52.598	<.001	<.001	-14.68750	1.71990	-18.13779	-11.23721

Based on the [Table 9](#), there is an average difference of 14.68, which is the result of the difference in scores before and after using e-modules in listening material. These results are taken from the pre-test and post-test results. The next step is to carry out the following paired sample t-test: (1) Formulate a hypothesis. By using the flipbook e-module there are significant differences in student learning. (2) Determining significance. The resulting significance level has been explained in [table 4.9](#) where the significance is <0.001. (3) Test criteria: (a) If the probability value (sig) is > 0.05, it can be concluded that there is no significant difference in the results of using the flipbook e-module and without using the flipbook e-module. (b) If the probability value (sig) < 0.05 then it can be concluded that there is a significant difference in the results of using the flipbook e-module and without using the flipbook e-module.

From the explanation of the SPSS testing above, a significance level of <0.001 is obtained, which means there is a significant difference in learning outcomes before and after using the flipbook e-module on listening material in Javanese language subjects in class IV.

2. Dialogue/pacelaton material

The function of product effectiveness testing is to determine the impact of the Javanese language flipbook e-module on dialogue/pacelathon material in improving the learning outcomes of class IV students. Data was taken from the results of the pre-test and post-test of class IV students at MI Cemorokandang, Malang City. The pre-test and post-test questions are listed on the attached sheet, while the assessment results from the pre-test and post-test are presented in the discussion. The test results using SPSS are explained in [Table 10](#).

Table 10. Paired Sample Statistics

		Group Statistic			
	Category	N	Mean	Std. Deviation	Std. Error Mean
Results	Pretest	32	69.3750	9.39715	1.66120
	Posttest	32	78.1250	8.77588	1.55137

Based on the results of the analysis ([Table 10](#)), it can be seen that the average pre-test score was 69.38 and the average post-test score was 78.13. It can be seen that there is an increase of 2.27. The pre-test is carried out before learning using the e-flipbook module. Next, determine the hypothesis with the results of [Table 11](#).

Table 11. Paired Sample Test

		Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference			
		F	Sig	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Results	Equal variances assumed	.576	.451	-3.850	62	<.001	<.001	-8.75000	2.27296	-13.29358	-4.20642
	Equal variances not assumed			-3.850	61.7112	<.001	<.001	-8.75000	2.27296	-13.29400	-4.20600

Based on the data above, there is a mean difference of 2.27, which is the result of the difference in scores before and after using the e-module dialogue/pacelathon material. These

results are taken from the pre-test and post-test results. The next step is to carry out the following paired sample t-test: (a) Formulate a hypothesis. By using the flipbook e-module there is a significant difference in student learning in listening material. (b) Determining significance. The resulting significance level has been explained in table 4.11 where the significance is <0.001. (c) Test criteria: (1) If the probability value (sig) is > 0.05, it can be concluded that there is no significant difference in the results of using the flipbook e-module and without using the flipbook e-module. (2) If the probability value (sig) < 0.05 then it can be concluded that there is a significant difference in the results of using the flipbook e-module and without using the flipbook e-module.

From the explanation of the SPSS testing above, a significance level of <0.001 is obtained, which means that there is a significant difference in learning outcomes before and after using the flipbook e-module for dialogue/pacelathon material in Javanese language subjects in class IV.

### 3. Sandhangan swara writing material

The function of product effectiveness testing is to determine the impact of the Javanese language flipbook e-module on the Javanese sandhangan swara writing material in improving the learning outcomes of class IV students. Data was taken from the results of the pre-test and post-test of class IV students at MI Cemorokandang, Malang City. The pre-test and post-test questions are listed on the attached sheet, while the assessment results from the pre-test and post-test are presented in the discussion. The test results using SPSS are explained in Table 12.

Table 12. Paired Sample Statistics

	Category	Group Statistic			
		N	Mean	Std. Deviation	Std. Error Mean
Results	Pretest	32	66,500	5.236735	0.92566
	Posttest	32	79.0625	8.07600	1.42765

Based on the results of the analysis (Table 12), it can be seen that the average pre-test score was 66.25 and the average post-test score was 79.06. It can be seen that there is an increase of 1.70. The pre-test is carried out before learning using the e-flipbook module. Next, determine the hypothesis with the results of Table 13.

Table 13. Paired Sample Test

		Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Results	Equal variances assumed	6.338	.014	-7.530	62	<.001	<.001	-12.81250	1.70148	-16.21371	-9.41129
	Equal variances not assumed			-7.530	53.150	<.001	<.001	-12.81250	1.70148	-16.22501	-9.39999

Based on the data of Table 13, there is a mean difference of 1.70, which is the result of the difference in scores before and after the use of the dialogue/pacelathon material e-module. These results are taken from the pre-test and post-test results. The next step is to

carry out the following paired sample t-test: (a) Formulate a hypothesis. By using the flipbook e-module there is a significant difference in student learning in listening material. (b) Determining significance. The resulting significance level has been explained in table 4.14 where the significance is  $<0.001$ . (c) Test criteria. (1) If the probability value (sig) is  $> 0.05$ , it can be concluded that there is no significant difference in the results of using the flipbook e-module versus without using the flipbook e-module. (2) If the probability value (sig)  $< 0.05$  then it can be concluded that there is a significant difference in the results of using the flipbook e-module and without using the flipbook e-module.

From the explanation of the SPSS testing above, a significance level of  $<0.001$  is obtained, which means that there is a significant difference in learning outcomes before and after using the flipbook e-module for dialogue/pacelathon material in Javanese language subjects in class IV.

### *3.3 Barriers and solutions in using Javanese flipbook e-modules*

After observing the use of the flipbook e-module, several obstacles were found including (1). Some students still need to adapt to using flipbook e-modules even though they usually use printed books, (2). The product requires improvements such as increasing practice questions in the form of games, (3). Javanese language subject teachers must be motivated to be more innovative and up to date with technological advances. For this reason, schools/madrasahs must hold training in making teaching materials more often and students must be more involved in using technology in the learning process.

## **4. Discussion**

In learning activities using teaching materials such as e-modules, they must be available which provide benefits, including containing standard content or nature of subject matter according to the applicable curriculum program, so as to reduce the occurrence of wrong views in the learning process. Due to the existence of learning activities, it can increase individual interest in learning, especially teaching materials that are made attractive with clear color displays so that they can also increase memory for important material. Indicators that can be used as a reference for evaluating the effectiveness and efficiency of using teaching materials (e-teaching module), namely (1) can improve student educational outcomes, (2) can motivate students to carrying out the learning process on an ongoing basis, (3) can improve students' memory of the content or material that has been studied, and (4) is able to make participants play an active role in applying the knowledge and skills learned (Sumartini, 2022). The e-flipbook module helps students a lot to understand Javanese language learning material, where a good e-module must be able to help make learning easier, make learning interactive, interesting because the e-module contains material that is not in text form but contains simple images, audio and the video is understood and understood by students (Hakim et al., 2020).

This flipbook e-module is equipped with a number of facilities such as animation, coloring, video links, images that show differences from the usual module. The features in the e-module can provide a sense of enjoyment and attract students' interest in studying the e-module. This is in line with the opinion of Muller, et al. In 2008, electronic-based teaching materials must provide special advantages so that students' interest in learning is more active and interactive and students' learning motivation becomes better (Riwu et al., 2018). Another opinion explains that teaching materials must be able to stimulate students and motivate students to learn so that learning objectives are achieved and make the learning process more interesting for students (Dwiyanti et al., 2021).

From the results of the student response questionnaire, it shows that this e-flipbook module is interesting and easy to access to help student learning. This is because e-modules make it easy for students to understand the material according to the explanation. The use

of flipbook learning media makes learning interesting, communicative, interactive, and the material is easier to understand (Amanullah, 2020). This is also in line with Hayati's opinion, namely that it can improve creative thinking skills and educate motivating students (Sa'diyah, 2021).

From the results of trials using Javanese e-modules in the field, several interesting things were found, such as students being more enthusiastic when learning using contemporary teaching materials or involving technology. Because technology, especially Information and Communication Technology (ICT), if integrated into education can be used to facilitate learning, overcome barriers of space and time, and encourage a flexible environment for students and teachers (Velarde-Camaqui et al., 2024). Apart from that, teachers are also more helped by the use of technology in learning, so there is a need for professional training and support for teachers to be able to develop learning strategies that enable STEAM learning, such as approaches to integrating art and technology and the use of formative and generative assessments to enable students to explain ideas and develop new understanding (Boice et al., 2024).

## 5. Conclusion

This development research provides some information needed by all stakeholders in learning Javanese in primary schools/madrasah ibtidaiyah. Because from the results of e-module product development, it was found that conventional learning in Javanese language subjects made students less likely to understand the learning material, especially in the implementation of an independent curriculum which required the use of TPACK in learning and made students more active. From the results of e-module product validation in terms of design and materials, a percentage was obtained of 85%, and from the results of language validation, a percentage of 93% was obtained and from the results of student responses, a percentage of 86.6% was obtained. So it can be stated that this Javanese language flipbook e-module is suitable for use in Javanese language learning in class IV elementary school/madrasah ibtidaiyah.

This development research is only on Javanese language subjects because this subject is a local content subject which is sometimes not studied well or lacks development of teaching materials. The development of teaching materials for Javanese language subjects should be done better because in implementing the independent curriculum schools/madrasahs are free to combine them with the uniqueness of a region to encourage schools/madrasahs to become better and maintain local wisdom. If students have good Javanese language skills, it will be easier for them to interact with local communities in their environment. This research focuses on developing the Javanese language, but in other regions the same product can also be developed to facilitate learning of local regional languages. So that the learning objectives in the independent curriculum can be achieved well.

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