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DEVELOPMENT OF FLIPBOOK MAKER-BASED INTERACTIVE TEACHING MATERIALS

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Abstract. *The purpose of the study was to determine the validity and responses of students to the development of flipbook maker-based interactive teaching materials in science learning for class VI simple electrical circuits. This type of research is Research and Development Borg and Gall with steps (1) potential problems, (2) data collection, (3) product design, (4) design validation, (5) design revision, (6) product trial, (7) product revision, the quantitative descriptive research method. Interactive teaching materials that have been developed have covered components, preface, table of contents, study instructions, core competencies, basic competencies, indicators, learning objectives, material descriptions, practice questions, summaries, and bibliography. In the first stage, the average material validation results were 66.67% and, the media validation average was 6.26%. In the second stage, the material validation average is 72.50%, the media validation average is 86.31%, and the average student response result is 87.00%. It can be concluded that interactive teaching materials based on flipbook maker in science learning class VI simple electrical circuit materials are feasible to be used as learning media.*

Keywords: *interactive teaching materials, flipbook maker, science, teaching, and learning.*

Main provisions of the article. Research objectives. The purpose of the study was to determine the validity and responses of students from the development of flipbook maker-based interactive teaching materials in science learning for class VI of simple electrical circuits.

Introduction. The role of teaching materials is needed in the learning process to create a certain atmosphere so that students can learn comfortably and pleasantly during the learning process. To create a fun and not the boring atmosphere for students in learning, interactive teaching materials are needed to support the online learning process during the COVID-19

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pandemic [1]. The use of interactive teaching materials is expected to help students in learning. The use of interactive teaching materials based on flipbook makers has not been widely used by teachers in the learning process, teachers do not take advantage of current technological developments. Based on observations made of grade VI students in 3 elementary schools in the Pangeran Diponegoro Demak cluster area, it was found that the teaching materials used were in the form of printed teaching materials [2]. Meanwhile, based on the questionnaire regarding the need for teaching materials, students want interactive teaching materials that can be accessed on smartphones because on average students are familiar with information technology and use it as a learning resource and information facility.

One way to provide interesting learning to students is with flipbook maker-based interactive teaching materials. Where the advantages of flipbook maker-based interactive teaching materials to be developed have the advantage that the results are in the form of links that can be shared with students via smartphones in which there is material supported by pictures, music, video quizzes that are interesting for students. With interactive teaching materials based on flipbook makers, it can encourage students to be more interested in learning and it will be fun. Especially during the current Covid-19 pandemic, the government recommends studying from home [3]. The development of science and technology can encourage changes, one of which is in the field of education, so the use of digital tools is needed in learning from home. The development of science and technology encourages changes that occur in people's lives, both relationships, perspectives, habits, economic, social, cultural and even educational levels [4].

Interactive media that can be used are flipbook maker-based interactive teaching materials. Flip book maker is a software that can be used to display teaching materials with electronic models. Making teaching materials can be done using software in the manufacture of multimedia-based learning media is expected to increase student's motivation to learn to understand teaching materials [5]. The use of flipbook maker-based interactive teaching materials or e-modules can increase the effectiveness, motivation, and understanding of students in learning [6]; [7]; [8].

Conceptual framework. The essence of science learning is to empower students to become scientists, make discoveries of natural phenomena, and find scientific products through scientific processes and attitudes. Scientific products are facts, concepts, generalizations, principles, theories and laws [9]. Science is the science of the physical world, and its impact will not only change the environment, but also change human perceptions of the problems faced in everyday life [10]. Science is the result of human activities obtained through certain ways, namely in an orderly, systematic, objective, methodical, and universally applicable way [11].

Researchers can conclude that science learning is student learning with the help of teachers who study the surrounding environment. The scope in addition to the surrounding environment, also includes humans and all life processes and the energy that surrounds them.

One of the innovations that can attract students' attention in the learning process is to use creative and innovative media [12]. One of the creative media is interactive teaching materials. Interactive teaching materials are not like printed or modeled teaching materials which can only passively control the user, users will participate in two-way action with the teaching materials they learn [13]. Modules are teaching materials that have stand-alone content and can be equipped with videos, images, animations, texts and quizzes [14]. The use of animation can increase students' attention and motivation to learn [15].



The teaching materials that will be developed in this research are e-modules or flipbook maker-based interactive teaching materials using a professional flip pdf application, which combines text, images, and other learning media, and presents them in digital format. which can be sent to students' smartphones using the links generated from the interactive teaching materials.

Flipbook maker is software that can be used to display electronic display modules. The software can be used to create multimedia-based learning media. Flipbook maker is software used to change the appearance of books or teaching materials into digital e-books in the form of flipbooks [5]. By using Flip Book Maker, students are more interested in learning because it has a more attractive appearance. Kvisoft Digital Book based flip book maker is a powerful software designed to convert PDF files into digital publications or digital books, this software can change the appearance of PDF files to make them look more like books. In addition, flipping machine-based digital books can also generate PDF files, such as magazines, digital magazines, flip books, company catalogs, digital catalogs, etc [16].

One of the developments of interactive learning media is Flip PDF Professional (Flip Builder). Flip Builder is an e-book maker software in the form of a flip book [17]; [18]. Flip builder has the advantage of being able to insert videos in PDFs so there is no need to open them in a separate place but directly into the PDF file [19].

Methodology.

Research design. This study uses a quantitative descriptive approach. The data sources are primary data from expert validators, teachers, and sixth grade elementary school students.

Respondents of the study. The population of this study was 95 grade VI students from 3 elementary schools in the City of Demak, Indonesia. The research is only at the stage of knowing the student's response to the resulting product. To conduct the research has been approved by the principals of the 3 elementary schools.

Sample how the table should be placed is as below. The data needed in this study is a feasibility assessment by an expert as well as student and teacher responses to flipbook maker-based interactive teaching in science learning for simple electrical circuits. Data collection techniques are in the form of questionnaires that will be given to experts and students. The instrument used for the expert is a written questionnaire sheet. The data collection technique carried out by giving a set of questions or written statements to respondents to answer is the meaning of a questionnaire [20]. Questionnaires can be administered directly or indirectly via the internet to respondents. Due to the Covid-19 pandemic, which made it impossible to collect students, the questionnaire was given via the google form link

The data analysis technique is based on the Likert scale score calculation. The use of the Likert scale to measure the attitudes, opinions, and views of a person or group about a social phenomenon [20]. The use of a scale of 1 to 5 where a score of 5 categories is very good, 4 categories is good, 3 categories is quite good, 2 categories is not good, and 1 category is not very good.

The assessment of interactive teaching materials based on flipbook makers in science learning on simple electrical circuits in this study has a minimum score of 4 with a good category. If the average value of the material expert and media expert is in good category, then the development product is adequate to use. If the test results of educators and students are also good, then the product developed is feasible to use.



Table 1. Evaluation Score

Score	Category
5	Very Good
4	Good
3	Quite Good
2	Not Good
1	Not Very Good

Table 2. Interval Score

Score Interval	Category
81% - 100%	Very Good
61% - 80%	Good
41% - 60%	Quite Good
21% - 40%	Not Good
0% - 20%	Not Very Good

Findings and discussion. In order to test the feasibility of flipbook maker-based interactive teaching materials in science learning for class VI semester 1 of simple electrical circuit material, expert validation was carried out in terms of material and media aspects. Validation was carried out on February 2, 2021 by providing an assessment through a questionnaire. The questionnaire for the material expert assessment has 24 statement items consisting of 3 assessment aspects, namely presentation, content, and language. Media expert assessment has 19 statement items consisting of 4 aspects, namely visual appearance, use of letters, physical criteria and interactivity, and ease of use. a minimum of 1 and a maximum score of 5. The score for each statement item is 5 with a very good category, 4 in a good category, 3 in a fairly good category, 2 in a poor category, and 1 in a not very good category.

The results of the validation of material experts and media experts on interactive teaching materials in science learning simple electrical circuit materials are carried out in 2 stages, can be seen in Table 3 and Table 4.

Table 3. Material Expert Validation Result

No	Aspect	Material Expert Validation Result	
		Stage I	Stage II
1	Presentation	16	17
2	Contens	32	36
3	Language	32	34
Total Score		80	87
Max Score		120	120
Presentage		66,67%	72,50%
Criteria		Good	Good

Based on table 3 of the assessment stage I validation of material experts, the average rating obtained a percentage of 66.67% with good criteria. The percentage of the material expert validation assessment phase II experienced an increase in the average assessment results obtaining a percentage of 72.5% with good criteria.



Good research design can increase effectiveness in learning. The results of Nopriyanti's research [21], show that the Professional 3D Pageflip-based electronic module product on technical drawings is feasible to use, the quality of this electronic module product is very good, the assessment of media experts and material experts from the aspect of display is 85 very good categories, learning aspects are 51 good categories and aspects 54 good categories of material, while the results of the students' assessment of the usage test on the display aspect of 956 very good categories and on the content aspect of 847 very good categories. The research and development subjects are product technology experts, material experts, and students. Likewise, the results of Isnaeni's research [22], show an average of 95.4% product technology expert validation, 97% material expert validation, and 91.6% student validation. E-module is effectively used in learning activities in the classroom as indicated by the normalized gain test > 0.7 of 0.75. While the research results of Seruni et al. [23], shows that the e-modules made have good interpretations from material, language, and media experts with a percentage of 83.35% to 85.00%. The results of field trials also get a good interpretation with a percentage of 84.39%. It can be concluded that the electronic module has a good category and received a positive response from students and lecturers.

Table 4. Media Expert Validation Result

No	Aspect	Media Expert Validation Result	
		Stage I	Stage II
1	Visual Display	22	30
2	Use of Letters	15	15
3	Physical Criteria and Interctivity	17	29
4	Ease of Use	8	8
Total Score		62	82
Max Score		95	95
Presentage		62,26%	86,31%
Criteria		Good	Very Good

Based on Table 4, the assessment of the first stage of media expert validation, the average assessment obtained a percentage of 62.26% with good criteria. The percentage of media expert validation assessment stage II experienced an increase in the average score of 86.31% with very good criteria."It's like the results Ibrahim [24], shows that the value of the feasibility of linguists both ie 3:00, media experts excellent ie 3:53, feasibility value ahlii material 3:25 very decent, small group trial responses of learners 3:15, large-scale testing 3.00, the desminate level trial is 3.40, and the test to educators is very interesting with a score of 3.86, this shows that the interactive teaching materials produced in the study are considered feasible to use.

From the results of expert validation, it can be concluded that interactive teaching materials based on flipbook maker in science learning simple electrical circuits are good in terms of materials and media.

In validation, the expert gets some suggestions and input from the validator which is used for improvement, including material expert advice for adding images according to daily life. Student responses are strongly influenced by the presence of pictures or photos so that they can motivate students to learn [25]. Meanwhile, media expert advice is in the form of a com-



bination of media with the addition of video and other interactive media. Adding videos in interactive digital teaching materials will make students more interested in learning.

From the explanation above, it can be concluded that interactive teaching materials based on a flipbook maker in science learning simple electrical circuit materials are suitable for use in learning.

Student responses were obtained from questionnaires distributed via google form. Questionnaires were distributed to sixth graders in 3 elementary schools, namely Public Primary School number 9 Bintoro, Public Primary School number 14 Bintoro, and Public Primary School number 1 Kadilangu, Demak with a total of 95 students. In the student response questionnaire there are 14 statement items from 3 aspects, namely attractiveness, presentation, and convenience. with a minimum score of 1 and a maximum score of 5. The score for each statement item is 5 with very good criteria, 4 with good criteria, 3 with fairly good criteria, 2 with not good criteria, and 1 with not very good criteria.

The following table shows the results of the questionnaire student's responses to interactive teaching materials based on flipbook maker in science learning class VI simple electrical circuits.

Table 5. Student Response Result

No	Aspect	Student Response Score		
		School 1	School 2	School 3
1	Attractiveness	1.330	484	1.064
2	Presenttation	1.172	425	880
3	Ease of Use	192	70	167
Total Score		2.694	979	2.111
Max Score		3.080	1.120	2.450
Presentage		87,47%	87,47%	86,16%
Criteria		Very Good	Very Good	Very Good

Table 5 data on student responses from Public Primary School number 14 Bintoro Demak obtained a percentage of 87.41%, Public Primary School number 9 Bintoro obtained a percentage of 87.47%, and Public Primary School number 1 Kadilangu obtained a percentage of 86.16% with an average percentage of the three schools of 87.00%, then the interpretation criteria achieved are very good, then the flipbook maker-based interactive teaching materials in science learning grade 6 simple electrical circuit materials have met the attractiveness criteria that are feasible and can be used.

Based on the results of student responses, it can be concluded that interactive teaching materials are based on flip book makers whose results are in the form of links that can be used for distance learning and the results are very interesting. The use of interactive teaching materials or e-modules is very good for use in learning [26]; [27].

The ability of teachers to manage learning using interactive teaching materials based on flipbook maker greatly influences learning outcomes. Teachers play an important role in learning because the quality of teachers still plays a key role [28]. According to Hesty's opinion in Puspita [9], that learning success is influenced by factors including teacher quality, student characteristics, availability of facilities and infrastructure and environmental factors. The need for interactive teaching materials is needed by students. Skills training outcomes can be improved, with the introduction of interactive teaching materials without increasing teacher time and improving performance. The performance of skills that have been prepared by stu-



dents with interactive teaching materials is significantly higher than the preparation of text-based teaching materials, both between groups and within groups [30], [31], [32].

Conclusions and Recommendations. In this research It was concluded that the development of flipbook maker-based interactive teaching materials on simple electrical circuit materials whose development was in accordance with 6th grade learning materials for science lessons. The response of students' interest in interactive teaching materials in 3 schools received very interesting criteria and the product was suitable for use in learning. In addition, there is a need for improvements to produce higher quality products and can be further developed for other learning. It is hoped that it can be continued until the effectiveness test is carried out to determine the level of effectiveness of the developed product.

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FLIPBOOK MAKER НЕГІЗІНДЕГІ ИНТЕРАКТИВТІ ОҚУ МАТЕРИАЛДАРЫН ӘЗІРЛЕУ

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Түйін. Бұл зерттеудің мақсаты: жаратылыстану пәндерін оқытуда Flipbook негізіндегі интерактивті оқу материалдарын әзірлеу барысында оқушылардың жауаптарының дұрыстығын анықтау. Зерттеудің бұл түрі (1) ықтималды қиындықтар, (2) деректерді жинау, (3) өнімді жобалау, (4) дизайнды тексеру, (5) дизайнды қайта қарау, (6) өнімді сынақтан өткізу, 7) өнімді қайта қарау, сандық сипаттамалық зерттеу әдісі. Әзірленген интерактивті оқу материалдарында мұқаба, кіріспе, мазмұны, оқу нұсқаулары, негізгі құзыреттіліктер, көрсеткіштер, оқу мақсаттары, материалды сипаттау, практикалық сұрақтар, қысқаша мазмұны және библиографиясы бар. Бірінші кезеңде материалдың валидтілігі бойынша орташа нәтижелері 66,67%, БАҚ орташа валидтілігі 6,26% құрады. Екінші кезеңде материалды тексерудің орташа көрсеткіші – 72,50%, медиа валидтіліктің орташа көрсеткіші – 86,31%, студенттердің орташа жауап нәтижесі – 87,00%.

Түйін сөздер: интерактивті оқу материалдары, Flipbook, ғылым, оқыту және үйрену.

РАЗРАБОТКА ИНТЕРАКТИВНЫХ УЧЕБНЫХ МАТЕРИАЛОВ НА ОСНОВЕ FLIPBOOK MAKER

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Аннотация. Цель исследования состояла в том, чтобы определить достоверность и реакцию учащихся на разработку интерактивных учебных материалов на основе Flipbook в изучении естественных наук. Этот тип исследования называется «Исследования и разработки Борга и Галла» с этапами (1) потенциальные проблемы, (2) сбор данных, (3) дизайн продукта, (4) проверка дизайна, (5) пересмотр дизайна, (6) испытание продукта, (7) ревизия продукта, количественный описательный метод исследования. Интерактивные учебные материалы, которые были разработаны, включают компоненты покрытия, предисловие, оглавление, учебные инструкции, основные компетенции, индикаторы, цели обучения, описания материалов, практические вопросы, резюме и библиографию. На первом этапе средние результаты валидации материалов составили 66,67 %, средние валидации носителей — 6,26 %. На втором этапе средний уровень проверки материалов составляет 72,50%, средний уровень проверки средств массовой информации составляет 86,31%, а средние результаты ответов учащихся составляют 87,00%. Можно сделать вывод, что интерактивные учебные материалы, основанные на создании Flipbook, в VI классе естественных наук, материалы простых электрических схем можно использовать в качестве средств обучения.



Ключевые слова: интерактивные учебные материалы, Flipbook, наука, перподавание и обучение.

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