

## Development of Electronic Teaching Modules Using Flip Books in Internet of Things (IoT) Subjects at SMK Negeri 6 Kupang

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### Abstract

*This thesis discusses the development of electronic teaching modules using the flipbook application. The purpose of this research is to produce a web-based electronic teaching module to facilitate students in independent and guided learning equipped with instructions for self-study, so that students can learn according to their abilities and can fulfill all the competencies that students must master in internet of things subjects. The type of research used in this research is R&D with Quantitative data analysis techniques using the ADDIE model. To measure the success of this electronic teaching module obtained by distributing questionnaires to media experts, material experts and to the main subjects in this study, namely students, as for the final results of this study which show the success of this research is the first media expert the value obtained from the assessment of the first media expert is 91%, the second media expert the value of money obtained is 97% while for the main subject, namely students, the results of the validation of the product feasibility questionnaire from students with an average value of 90.76% This indicates that the teaching module developed has met the expected quality standards from various aspects.*

**Keywords:** *Electronic teaching module, flipbook, IoT.*

### INTRODUCTION

The very rapid development of technology has brought progress to almost all aspects of life. One of the technological developments is the internet, namely technology that provides ease of communication globally and allows people to obtain and exchange information quickly. The large amount of internet use among students is both a challenge and an opportunity for teachers. Technology can be used to encourage the learning process, support communication arrangements, assess learning activities, manage resources and create learning materials (Nadiyah & Faaizah, 2015). Changes in the world of education change the system's perspective learning from what was initially conventional to become modern. Learning that was initially teacher-centered changed to student-centered, students were also free to obtain information and teaching materials (Annake, 2013). Therefore, teachers as facilitators of the world of education are required to be able to utilize and even develop technology products in order to improve the learning process. One of the teaching materials that can be developed is e-modules or electronic learning modules. Utilizing and empowering e-modules to support learning is a necessity, not only to increase the effectiveness and quality of learning. class system digitalization. Researchers

also found problems during the learning process and were asked to take notes, after which students were given the opportunity to watch video tutorials on YouTube in practice in the practicum room, but the teacher does not explain the material provided in advance, besides that, teachers tend to use textbooks so that students do not understand the material taught by the teacher and other problems. Students often look for material on the internet because the teaching modules or learning resources are not complete and detailed. that has been given. So, the researcher is interested in conducting research with the title "Development of Electronic Teaching Modules Using Flip Books in Internet of Things (IoT) Subjects in Class XI TJKT 1 SMK Negeri 6 Kupang"

### METHOD

#### A. Types of research

The type of research used in this research is Research and Development (R&D) or what is said to be research and development. So in this research the researcher will create a web-based learning media to support teacher learning, making this application the researcher also uses the ADDIE model (Analyze, Design, Develop, Implement, and Evaluate).

#### B. Data Analysis Techniques

This research uses a questionnaire with the aim of determining the level of accuracy, effectiveness and attractiveness of web-based teaching module products using flipbook created by researchers.

$$P \frac{x}{xi} \times 100\%$$

Is :

P = Percentage what you are looking for

X = Number of answers

Xi = Total ideal value for the entire item

100% = Constant number

## RESULTS AND DISCUSSION

### A. Results

#### 1. Product Display Front Cover Page Module

Teaching Module Cover Page electronic it contains the Module title, eye name lessons, no writer module, year of creation and name of school of origin



Figure 1. Electronic Teaching Module Cover Page

#### 2. Learning Outcomes and Learning Objectives page

Cp and TP page Teaching module electronic it contains Learning and Learning Objectives that students will achieve in the next few meetings which have been designed in this electronic teaching module.



Figure 2. CP and TP pages

#### 3. Learning Module Arrangement Page

The general information page for this teaching module contains the composition of learning modules, including the general identity of the core competency module, Pancasila student profile, facilities and infrastructure, target students, learning models, core activities and learning objectives that students will achieve in learning.

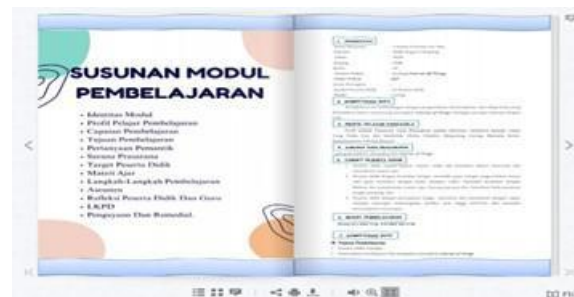


Figure 3. Learning Module Arrangement Page

#### 4. Assessment Page, Meaningful Understanding and Meetings

This page contains assessments, meaningful understanding, trigger questions and descriptions of each meeting in the teaching module electronic This.



Figure 4. Assessment page, meaningful understanding and meeting

**5. Module Attachment Page**

The attachment page for this electronic teaching module contains quizzes that will be taken by students and also attachments for LKPD 1-3

**6. LKPD page**



Figure 5. Module Attachment Page

This LKPD 1 attachment page contains the theme or topic of the material to be discussed, the student's name, class, and the student's worksheet or LKPD.

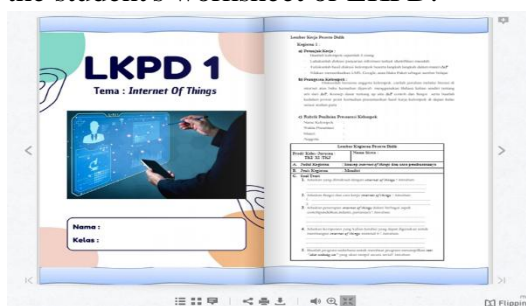


Figure 6. LKPD page

**B. Validation of Media Experts I, II, Material Experts and Students.**

**1. Validation of Media Experts I, II and Material Experts**

Table 1 Results Validation calculations for Media Experts I, II and Material Experts

No.	Validasi ahli media/materi	Jumlah Keseluruhan Hasil/Jumlah Nilai Ideal Untuk Keseluruhan Item	Tingkat Pencapaian	Kualifikasi Kelayakan
1	Ahli Media Pertama	33 / 36 * 100	91 %	Sangat Baik, tidak perlu direvisi
2	Ahli Media Kedua	35 / 36 * 100	97%	Sangat Baik, tidak perlu direvisi
3	Ahli Materi	58 / 60 * 100	96 %	Baik, tidak perlu direvisi
<b>Jumlah</b>			<b>284%</b>	

Based on the results of the questionnaire calculation above, the table shows the results of the First Media Expert validation, the results show that the total number of results is

33 divided by the ideal number for all items, namely 36 and multiplied with 100 getting an achievement level score of 91% with Very Good eligibility qualifications, no need for revision. The results of the Second Media Expert validation, the results show that the total number of results is 35 divided by the ideal number for all items, namely 36 and multiplied with 100 and get an achievement level score of 97% with Very Good qualifications, no need for revision. As a result of the Material Expert validation, the results show that the total number of results is 58 divided by the ideal number for all items, namely 60 and you get an achievement level score of 96% with eligibility qualifications. Good, no need to revise.

**2. Student Questionnaire Validation Results**  
**Table 2. Student Questionnaire Validation Results**

No.	Jumlah Siswa	Jumlah Keseluruhan Hasil/Jumlah Nilai Ideal Untuk Keseluruhan Item	Rata – Rata	Tingkat Pencapaian
1	10	57 / 60 * 100	95 %	Sangat Baik, tidak perlu direvisi
2	25	56 / 60 * 100	93%	Sangat Baik, tidak perlu direvisi
3	11	55 / 60 * 100	91%	Sangat Baik, tidak perlu direvisi
4	3	54 / 60 * 100	90 %	Sangat Baik, tidak perlu direvisi
5	7	53 / 60 * 100	88%	Sangat Baik, tidak perlu direvisi
6	8	52 / 60 * 100	86 %	Sangat Baik, tidak perlu direvisi
7	2	51 / 60 * 100	85 %	Sangat Baik, tidak perlu direvisi
8	3	81 / 60 * 100	81 %	Sangat Baik, Tidak perlu direvisi

Based on the data provided, it can be concluded that in general students gave a positive response to the web-based electronic teaching module that was developed. Most students rated the teaching module well. The scores obtained vary from 81% to 95%. This shows that there are variations in students' perceptions of the teaching module. Meanwhile, most students gave high scores (above 85%). This indicates that in general, students responded positively to the electronic teaching module that was developed.

**C. Discussion**

Based on the results of the questionnaire calculation above, the table shows the results

of the validation of class final 90.76% and achievement level is very good. So, it can be concluded that according to the results of the questionnaire from class taught in the subject of Internet of Things (IOT), class XI TJKT 1 and TJKT 2 SMKN 6 Kita Kupang. The validation results show that overall, students really accepted the electronic teaching module that was developed.

So, the average validation result obtained from the 3 media experts above as a whole is 284% divided by 3 so that the final result is 94.6% with a Very Good eligibility qualification that does not need to be revised. So, it can be concluded that from the results of the first, second media experts, and one material expert regarding the Teaching Module Electronic Web-based is suitable for use as a teaching module in Internet of subjects Things (IOT), class XI TJKT 1 and TJKT 2 of SMK Negeri 6

## CONCLUSION

Based on the results of implementing web-based electronic teaching modules in IoT subjects, it can be concluded that the teaching modules created using the Flipbook application are suitable for application as learning media, this can be seen from the results of the product feasibility questionnaire for media experts I, II and III with the first media expert. The value obtained from the first media expert assessment is 91%. This means that media experts give a very high assessment of the electronic teaching modules being developed. Second media expert Comparison with Previous Results: The 97% score obtained from the second media expert is slightly higher than the score obtained from the first media expert (91%). This indicates that there is a very high level of conformity between the teaching modules and the standards set by experts in the field of learning media. Meanwhile, the material expert's score of 96% obtained from this material expert shows the consistency of the validation results which is very good. Both the first, second media experts and material experts gave a high assessment of the teaching module. This indicates that the teaching module developed has met the expected quality standards from various aspects and the

results of product feasibility questionnaire validation from students with an average score of 90.76%. This shows that the teaching module has been well received by students.

## SUGGESTION

Based on the research results in this study, the researcher conveys the following suggestions:

1. As a teacher, you must be able to create other interesting and creative teaching modules for use by both teachers and students
2. This teaching module is only for IoT material, it is hoped that future researchers can add other material
3. Utilization of Open-Source Platforms: Consider using open-source platforms for developing teaching modules to make them more flexible and easier to customize.
4. Learning Community Development: Form a learning community to share experiences and knowledge related to the development and use of electronic teaching modules.
5. The teaching module that the researcher created is still simple, it is hoped that further researchers can develop it to be more interesting for use in the learning and teaching process in educational institutions.

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