Uniglobal of Journal Social Sciences and Humanities
Journal Homepage: www.ujssh.com

Digital E-Book Development Using Any Flip to Improve Student Learning Outcomes on Firewall Materials

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Received 11 November 2024, Revised 25 November 2024, Accepted 9 December 2024, Available online 10 December 2024

To link to this article: https://doi.org/10.53797/ujssh.v3i2.42.2024

Abstract: The research objectives were to determine whether using Any Flip to create digital e-books to teach firewall material was beneficial, to evaluate the impact of digital e-books on student educational outcomes, to determine aspects of Any Flip that improve learning outcomes, and to provide suggestions for teachers on how to use Any Flip to teach firewall material effectively. Objectivecreated an interactive digital e-book based on Any Flip about firewall content. to assess whether digital e-books have a positive impact on student learning outcomes. to evaluate electronic book usability and user satisfaction. In this research, product development was carried out in the form of electronic media to improve student learning outcomes on Firewall material. This research used limited tests at SMKN 1 Kediri in the odd semester of the 2024/2025 academic year involving 30 class XI SMK students as research subjects. Learning media in the form of user-friendly digital e-books was developed as a result of research to improve student learning outcomes in class XI Firewall material. The researcher validated the finished e-book to two validator lecturers after the digital e-book media validation process was entered and corrected. Results after validation testing the validity of the e-book. there are several results, including e-book usability 93.33%, e-book effectiveness 90.00%, e-book material content 93.33% and e-book appearance 83.33% so that the average level of validity of electronic usability, book efficacy, material and appearance is equal to 89.99 percent. The firewall material e-book media using Any Flip Maker is considered valid and has very good requirements.

Keywords: Digital e-book, Any Flip, Learning Material, firewalls

1. Introduction

The creation of digital e-books utilizing Any Flip is a potent technique for enhancing student learning outcomes, particularly when it comes to comprehending challenging firewall content. The information in the e-book will be based on instructional design principles, making it clear and well-organized. The flip feature provides an eye-catching interactive aspect and was inspired by the 3D Page Flip3-based e-book (Wiharjo et al., 2020). Teachers may design more immersive and productive learning environments for students by using interactive components, multimedia, and interesting information.

The construction of this e-book employs a similar process to successfully create digital handouts and modules in several areas, including science (Lestari & Wijayanti, 2021), mathematics (Nurvita et al., 2022), and quantum mechanics. With the use of the ADDIE development process, which includes stages for analysis, design, development, implementation, and evaluation, we ensure that e-books adhere to the highest criteria of effectiveness and quality.

Teachers can build digital e-books that students can browse and quickly navigate using Any Flip. The platform makes it possible to incorporate different multimedia components, such as pictures, movies, and interactive tests, which can aid students in understanding and remembering difficult firewall ideas. Teachers can address the knowledge gaps frequently seen in conventional STEM training by combining visual, inductive, active, and global learning strategies (KrishnankuttyRema & Shilov, 2020).

Digital e-books made using Any Flip can be updated and shared with students, as well as enhancing the learning experience. This enables teachers to maintain content that is current and pertinent while making sure that students always have access to firewall technology. Applying the flipped classroom concept is one way to use digital e-books to improve

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student learning outcomes. In this methodology, students read the material from the e-book before class, allowing for more in-depth discussions and practical exercises (Grigg & Stephan, 2018). This strategy has been demonstrated to improve student performance and engagement in a range of educational contexts.

Including cooperative learning and project-based learning components in e-books is another tactic to enhance student learning results. Teachers can promote a deeper comprehension of firewall materials and their useful applications by giving students real-world examples and chances to work with their classmates (Li et al., 2020). In summary, Any Flip can dramatically enhance student learning outcomes when used to produce digital e-books for teaching academic courses. For their pupils, teachers can design more engaging and fruitful learning experiences by fusing multimedia components, flipped classroom models, and cooperative learning techniques.

2. Research Methods

Using research and development methods to put this research into practice. A product is created and its efficacy is tested using the research and development (R&D) method. The feasibility and effectiveness of developing educational products, such as learning materials or applications, to achieve the desired goals are ensured by using this method (Lewis et al., 2021). R&D methods usually involve several stages, including planning, design, development, validation, and testing (Yiu et al., 2020). The R&D model for conducting research is the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). In this research, product development in the form of electronic media was carried out to improve student learning outcomes in Firewall material. This study used a limited test at SMKN 1 Kediri in the odd semester of the 2022/2023 academic year involving 30 students of class XI SMK as research subjects. This procedure has several steps as presented in Fig. 1.

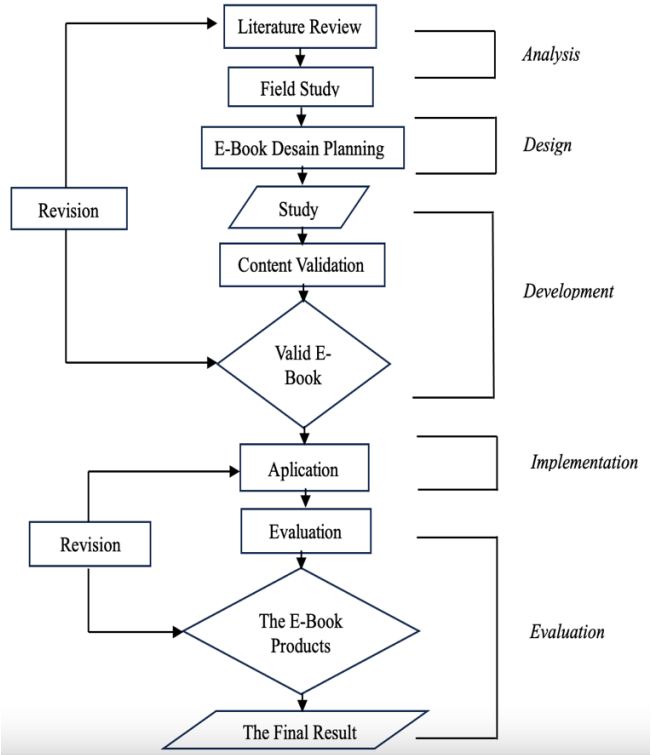

Figure 1. ADDIE research scheme (modified from Branch, 2009)

2.1 Analysis Stage (Analysis)

Before starting the research, the researcher conducted a non-formal interview with the professor of glasses at SMK Negeri 1 Kediri regarding the problems and constraints experienced by the Computer and Network Engineering teacher in learning. From the results of the interview, the teacher explained several obstacles such as the teacher who played an active role in learning compared to students, and the teacher's limitations when presenting material only with media using whiteboards and PowerPoint only. this is what causes students to become passive during learning and it is difficult to understand the material received and creates a non-interactive learning atmosphere between teacher and students. then the teacher added materials that were classified as difficult to understand, one of which was firewall material.

Researchers discovered a potential in the fact the hat majority of the Computer and Network Engineering students and instructors at SMKN 1 Kediri own electronic devices es such as PCs and laptops. Schools are also equipped with internet

network facilities in the form of adequate wifi hotspots. The ability to operate electronic devices is quite good and the electronic devices they use are also quite good. Fig. 2. shows the example of a digital e-book.

Figure 2. An example of a digital e-book display using Anyflip

2.2. Development Stage

SectioBased on of the original design, validation tests were run on the final e-content books and layout. Two media expert validator lecturers in the study program for computer and network engineering received the validation test. The validation test has the aim of assessing the product that has been made worthy of being tested. This product validator is practicable to use, and the two lecturers offer suggestions for design enhancements, as indicated in Table 1, in the evaluation of the two lecturers.

Table 1. Lists the results of the design validation tests.

Tips for improvement	Applying a fix
Enhances the contrast of dark photos	It is easy to see the country replacing the image.
Boost your grammar	Correcting sentences where the writing is still wrong
Centered font size	Sentences where the writing is still incorrect Equalize the font sizes for a cleaner appearance.
Contains usage guidelines for the product	Create a user guide for the product that includes images and the button functions employed.
Sentences about how oil and water differ in density should be made simpler.	In the description of the illustration showing the difference between the densities of oil and water, changing the phrase "floating" to "above"
Give details about the picture.	Inform the audience
Align the test questions with the sample test questions.	Provide examples of the test questions to balance the workload of the questions.

The product validator was updated as instructed by the two lecturers after receiving their feedback. The product is prepared for testing when it has been satisfactorily corrected. Media validation sheets, student response surveys, and specialized assessments were used to gather the data for this study. Two media specialist validator lecturers from the Computer and Network Engineering Program conducted the media validation. Participants were seated in class XI at SMKN 1 Kediri with a total of 30 students. They were given unique examinations and questionnaires about student responses. Utilizing student responses, the effectiveness of the material, language, and media was evaluated. The questionnaire was also utilized to learn what the students thought of the e-book. This survey will be distributed after the lesson, and the results will serve as feedback for revising the e-book.

The N-gain score calculated using the Hake formula to evaluate the efficacy of the pre-test and post-test analysis scores. If data on the authenticity of the media obtained achieves a percentage value of 61 percent, as shown in Table 2, it is deemed appropriate for use in the learning process:

Table 2. Criteria for the validity of the test

No.	Percentage (%)	Criteria
1	10- 20	Very low
2	21- 40	Low
3	41- 60	Enough
4	61-80	High
5	81- 100	Very high

Regarding the developed media, it is considered practical if the evaluation of the respondents meets the standards of "practical and highly practical," as shown in Table 3.

Table 3. Criteria for the validity of the test

Percentage (%)	Criteria	Information
0- 20	Very low	Can be used without revision
21- 40	Low	Usable with minor revisions
41- 60	Enough	Recommended for use
61-80	High	Cannot be used
81- 100	Very high	Cannot be used

Testing 30 students in class XI at SMKN 1 Kediri to evaluate student learning outcomes in studying firewall content using the Digital e-book media, the Any Flip application, provided the findings for the practicality and effectiveness assessments.

3. Research Result

Learning media in the form of user-friendly digital e-books was developed as a result of a study to improve student learning outcomes for class XI Firewall material. The researcher certified the finished e-book to two validator lecturers after the digital e-book media validation process was inserted and fixed. The outcomes, following validation, resemble the graph in Fig. 3.

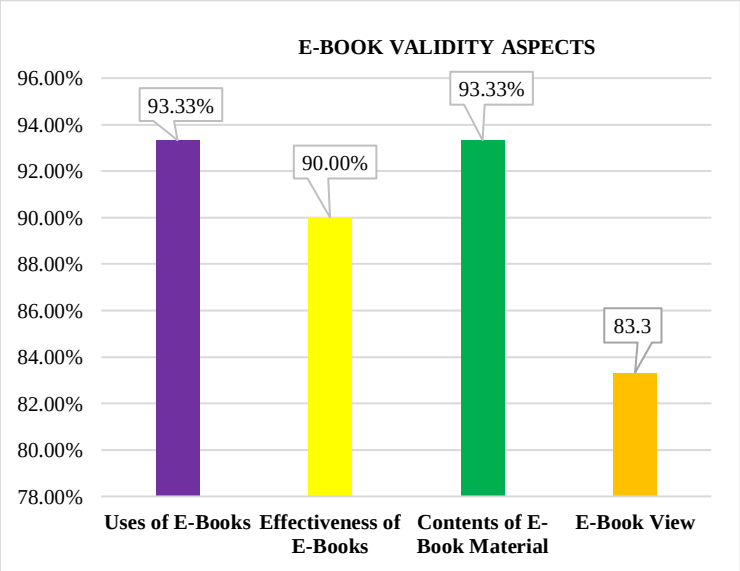

Figure 3. Digital e-book validity using Any Flip

According to Fig. 3. the average validity rate for the e-usability, book's efficacy, materials, and look is 89.99 percent. E-book media on static fluid material using AnyFlip Maker is deemed legitimate and has very good requirements, according (Oyaid & Alshaya, 2019).

3.1 Implementation Stages

The product will then be used for a test run. To determine the learning results of the students after engaging in teaching and learning activities using the research-developed media, the following test steps were implemented on 30 students who were in class XI at SMKN 1 Kediri. To determine the students' first comprehension of the firewall material, a pre-test was provided to the class at the outset.

Students receive a product in the form of a digital e-book that is utilized for continued study after completing the pre-test work. Students were encouraged to open the distributed e-book after the researcher had handed out the product and had continued to demonstrate how to use it. For the first meeting, they had examined the sub-material for user data security. Students spent the entirety of the second meeting studying the surface tension sub-material. Students are permitted to examine and ask questions about topics that they don't fully understand once everything has been covered. The post-test test questions were distributed by the researcher once everything was finished. The analysis of the pretest and posttest data involved calculating the N-gain value, and the resultant N-gain value of 0.84 was considered to have a significant impact on the learning outcomes of the students as illustrated in Table 4.

Table 4. Enhanced Learning Results

No	No Value Range	Number of Students	
		Pre-Test	Post-Tes
1	91-100	0	21
2	81-90	0	15
3	71-80	5	0
4	50-70	24	0
5	< 50	7	0
	Average	56,33	93, 60
	Maximum Value	80	100
	Minimum Value	40	84
	N-Gain Value	0.84	

3.2 Evaluation Stage (Evaluation)

After the post-test, students were given a questionnaire to fill out to rate the effectiveness of the learning resources that were used. The only options on the box-filling device are "Yes" and "No." Table 5 displays the outcomes of the student response survey.

Table 5. Displays the Outcomes of the Student Response Survey.

Aspect	Statement given	Total students who voted "Yes"	Percentage (%)
Presentation	This media encourages your curiosity	36	100
	This media adds to your motivation to study Computer and Network Engineering	35	97.2
	This medium is easy to operate	36	100
	Media can help you to be more active when the learning process is carried out	34	94.4
	Interesting and fun medium	35	97.2
Language	Application of language in products that are easy to understand	36	100
	Use of language in communicative products	36	100

	Concise and concise sentences/words	36	100
	The terms in the media are easy to understand	34	94.4
Illustration	The illustration of the picture corresponds to the concept of learning	36	100
	Picture illustrations help to understand the concept	34	94.4
	The description of the media is aligned with the material	34	94.4
	Descriptions and illustrations through pictures and videos are easy to understand	34	94.4
learning	e-book on learning helps in the process of understanding literature	36	100
	I easily understand firewall material	34	94.4
	The teaching and learning process can be more interactive using e-books	33	91.7
	Percentage average	97.03	

4. Discussion

Based on the media response questionnaire in Table 5, it was determined that, in terms of media presentation, the language used in the media, graphics in the media, and learning through the media, the average student response rate was 97.03 percent. These findings indicate that the media is very useful, and that it may be used to support learning. This justification is consistent with the consensus (Samorodskaya et al., 2022).

In terms of presentation, the media is made as appealing and user-friendly as possible for vocational students so that the learning environment is enjoyable and students take an active role in their education. This is in line with the results of the survey, which showed that up to 36 students selected "Yes" on the media platform to promote curiosity and ease of use, up to 30 students selected "Yes" for the media platform to increase motivation to learn glasses, engage students, and make learning enjoyable, and up to 24 students selected "Yes" at the media student station to encourage students to participate more actively during the learning process.

The media is presented in the most appealing way possible and is made as simple as possible for vocational students to use so that the learning environment is enjoyable and students will be engaged in their studies. According to the responses, 36 students selected "Yes" on the media platform to promote curiosity and ease of use, 30 students selected "Yes" for the media platform to increase motivation to learn glasses, make students interested, and feel fun, and 24 students selected "Yes" at the media student station to support students in being more active during the learning process.

The media then uses visuals and films that are relatable to the subject and simple enough for high school pupils to understand as illustrations. This is in line with the results, which showed that up to 30 students responded "Yes" to the question about illustrated images that support the learning concept, and up to 24 students responded "Yes" to the question about illustrated images that support the concept and descriptions of the images and videos that are relevant to the subject matter and simple to understand. And in terms of learning, the development of e-book media will facilitate the process of comprehending firewall information in books and provide an interactive learning environment. According to the responses, 36 students selected "Yes" on the e-book terminal to aid in the process of understanding literature, 30 students selected "Yes" for the claim that students understand the Firewall material in the e-book, and 24 students selected "Yes" for the claim that using digital e-books can make the teaching and learning process more interactive.

These findings show that the created media has several benefits and drawbacks. Digital e-book media that are easy to use and designed with the Any Flip application to pique students' interests can help with the process of understanding literature. This can increase students' enthusiasm for learning and confidence in carrying out learning, resulting in a better understanding of the component material that is delivered to them.

Along with the previously mentioned benefits, this program also has drawbacks including a significant storage requirement and the fact that Flash players no longer support it. Installing the Any Flip app is therefore required before opening a Digital e-book.

5. Conclusion

It is possible to utilize the developed learning resource as a teaching tool in schools while teaching eyeglasses, especially for firewall content, based on the description that has been provided and the learning resource's declaration of validity and very good category. Therefore, it is included in the effective category in its application for the efficacy of generating Digital e-books with the Any Flip application, which is used as a medium for the acquisition of learning outcomes from students in static fluid content.

However, from the perspective of presentation, language, pictures, and learning through media, it is indicated that employing digital e-books with the Any Flip application as a learning medium for the acquisition of student learning outcomes relating to Firewall material is extremely practical. In other words, this media can be utilized as a learning tool since it is a new teaching tool for more interactive classes and because it offers professors a fresh approach to getting students more involved in learning about computer and network engineering.

Acknowledgement

The authors would like to express their gratitude to the Universitas Bumigora for their support in providing both facilities and financial assistance for this research.

Conflict of Interest

The authors declare no conflicts of interest

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