

Design and Build of Interactive Learning Media Based on Adobe Animate Software for Basic Electronic Engineering Subjects at SMK Negeri 5 Padang

Dalfitra*, Ilmiyati Rahmy Jasril, Efrizon, Ika Parma Dewi

Department of Electronics Engineering, Universitas Negeri Padang, Padang, Indonesia

*ORCID: <https://orcid.org/0009-0008-0555-763X>

Abstract - This study aims to develop interactive learning media based on Adobe Animate for Basic Electronics Engineering subjects at SMK Negeri 5 Padang and to assess the validity of the created learning media. The research utilizes the Four D (4D) model, which includes the stages of define, design, development, and dissemination. The learning media will be evaluated for both validity and practicality (user trials). The validity test was conducted by four experts—two media experts and two material experts—while the practicality test was performed by 16 students. The validity test results were 90% from media experts and 96% from material experts, both categorized as "very valid." The practicality test results were 91.33%, classified as "very practical."

Keywords— Learning Media, Adobe Animate, Fundamentals of Electronics Engineering.

I. INTRODUCTION

The fourth industrial revolution, or industrial revolution 4.0, is about to begin throughout the world. This revolution is bringing about changes in a number of industries because of the deep integration of technology. These modifications undoubtedly have an impact on the world of education. These days, innovation and making the most of technology, the internet, and information are the main goals of education. [1]. Therefore, the role of education, through innovation or a revolution in educational practices, is highly anticipated to help cultivate a superior generation capable of competing in the 21st century. This era is renowned for its numerous transformations, notably the rapid advancements in science and technology. These developments have prompted a shift in the educational paradigm, marked by changes in curriculum, media, and technology.

Learning supported by information and communication technology (ICT) is an essential part of current educational needs. In the 21st century, the use of technology as a learning aid is required to enhance learning skills. Learning media play a crucial role in improving the teaching and learning process. They can also make the learning process more engaging and

enjoyable. However, the effectiveness of learning media is greatly determined by the ability of the teacher or instructor to deliver the material [2]. In addition, well-packaged learning media will help students learn better. Conversely, if displayed in an inappropriate way, it can cause students' abilities to be difficult to develop.

Learning media encompass all types of physical tools crafted to transmit information and foster interaction. These tools include tangible objects, printed materials, visuals, audio, audio-visuals, multimedia, and web-based resources. They must be intentionally designed and developed to align with the learners' needs and the learning objectives [3]. Learning media serve as a resource that supports teachers in broadening students' understanding. With the diverse learning media employed by teachers, they can serve as materials for imparting knowledge to students [4].

Interactive learning media refers to a learning program that integrates text, images, videos, animations, and more, facilitated by computers to meet learning objectives, allowing users to actively engage with the program [5]. Interactive media is designed with a display that effectively communicates information or messages and offers interactivity for its users [6].

Based on the definitions from various experts, interactive learning media can be concluded as the application of media in the learning process, where the created media combines text, video, images, and animation with an engaging appearance to convey information or messages. It aims to achieve learning objectives, includes controls for user interaction, and provides interactivity for its users.

One of the developments in information and educational technology in the twenty-first century is the availability of learning media applications based on Android that can take in material from anyplace. The goal of android-based learning resources is to enable students to learn more easily at any time, anyplace, and without regard to location, time, or space constraints. Learning materials based on Android have special qualities because they are portable and useful. Learning materials packaged as applications that are deployed on

DOI: 10.18782/ijeclxx-xx

<https://doi.org/10.18782/ijeclxx-xx>

Corresponding author: Dalfitra

Universitas Negeri Padang

Email: dal280299@gmail.com

Received: August 2024.

Revised: September 2024.

Accepted: October 2024.

Published: October 2024.



For all articles published in IJSEHT <https://ijseht.ppj.unp.ac.id/>, © copyright is retained by the authors. This is an open-access article under the [CC BY-SA](#) license.

Android phones using mobile communication technology are known as Android based learning materials. [7].

Adobe Animate is a multimedia creation and animation application developed by Adobe Systems. This program allows users to create animations, images, films, presentations, games, and quizzes. Formerly known as Adobe Flash, Adobe Animate is a tool designed for developing educational media with features such as animation, graphics, text, and sound. [8]. By utilizing Adobe Animate, interactive media can be created that features images, videos, text, music, and sound. Learners can interact with this media using control buttons, creating an engaging and enjoyable learning environment. The ability of this media to combine images and sounds helps to alleviate boredom and increases student interest, making lessons that use such media more appealing compared to traditional teacher-led lectures.[9].

Based on observations made at SMK Negeri 5 Padang, it is known that the learning media used previously were jobsheets, books, and PowerPoints. The learning applied so far has not been able to make students active in the learning process. The learning medium has not been able to support the learning value of grade X Electronics students in the Basic Electronics Engineering subject. The total number of students in class X Electronics is 51, divided into 2 classes. Of these students, 31 have not reached the Criteria for Achieving Learning Objectives for the subject. This information indicates that the learning objectives have not been met. To support this, it is necessary to create interactive learning media for Basic Electronics Engineering subjects.

II. METHOD

The method that researchers will use is the Four-D (4-D) method. The 4D method is an extension of Define, Design, and Development and Dissemination [10]. The following is a description of the stages of the 4D method:

A. Define Stage

This stage involves identifying the products to be developed and outlining their specifications. It encompasses a needs analysis conducted through research and literature review. The process starts with analyzing students by distributing open-ended questionnaires to those enrolled in the Basic Electronics Engineering Class X Electronics at SMK Negeri 5 Padang. During this stage, interviews were also held with the relevant subject teachers to discuss the curriculum being used, namely the independent learning curriculum, the elements in the Basics of Electronic Engineering subject, and the elements that will be made learning media using Adobe Animate, namely elements 9 and 11.

B. Design Stage

This stage involves designing the products that have been identified. The design starts with making a flowchart containing the flow of making learning media and designing the application interface, or storyboard. The results obtained at this stage are the flowchart for making learning media and the application interface design.

C. Development Stage

This stage involves converting designs into actual products and iteratively testing their validity until the final product meets the established specifications. Making this application

begins with making backgrounds, buttons, and assets that will be used in the application. Making backgrounds, buttons, and assets is done using Adobe Illustrator software. Then the background, buttons, and assets are inputted into the Adobe Animate software, and then the background and buttons are arranged according to the storyboard on each page. After the preparation is complete, the animation needed on each page is given. Then input the coding script so that the application can run according to the flowchart that has been made. After the coding process is complete, the application is converted into an Android app so it can be accessed via an Android smartphone. At this stage, if there are revisions, changes will be made according to the suggestions and input from the supervisor and the relevant subject teacher. If there are no revisions, the learning media is considered complete and will proceed to the validity testing stage. This validation testing is conducted by two media experts and two material experts. During the test, an assessment is carried out that will be distributed in the form of a questionnaire that aims to assess whether the learning medium is valid or invalid. Descriptive analysis is used to calculate the percentage of validation results, which will then be applied using the following first equation:

$$\text{Persentase(\%)} = \frac{\text{skor yang didapat}}{\text{skor yang diharapkan}} \times 100\%$$

The feasibility of the learning medium will be identified with the percentage of achievement according to the category that can be shown in Table 1 [11].

Table 1. Validation Categories

No.	Achievement level (%)	Categories
1.	0%-25%	Very Invalid
2.	25,01%-50%	Invalid
3.	50,01%-75,00%	Valid Enough
4.	75,01%-100%	Very Valid

D. Dissemination Stage

This stage involves activities to distribute the completed products and subsequently test them on users to assess their practicality. The user trial was conducted on class X Electronics students with a planned number of respondents of 16 students at SMK Negeri 5 Padang. The percentage of practical results obtained will be calculated using the following second equation:

$$NA (100\%) = \frac{R}{SM} \times 100\%$$

Description:

NA : Final Score

R : score obtained

SM : Maximum score

The percentage of practical achievement for the created learning media will be determined using the practicality category outlined in Table 2.[12].

Table 2. Practicality Categories

No.	Achievement level (%)	Categories
1.	0%-25%	Very impractical
2.	25,01%-50%	Not Practical
3.	50,01%-75,00%	Practical enough
4.	75,01%-100%	Very Practical

III. RESULTS AND DISCUSSION

A. Results

Learning media products are made using Adobe Animate software, with the final result in the form of applications that can be accessed via Android phones. Here is an explanation of the results from the interactive learning media for Basic Electronics Engineering subjects:

1) Intro Page Display, The Intro Display is the initial display when the learning media is run. On this page, there is a motion tween animation as a loading animation for the application. The initial appearance of this interactive learning medium is illustrated in Figure 1 as follows:



Fig 1. Intro view

2) Main Page Display, This main menu contains menus displayed on interactive learning media, namely Instructions, CP and ATP, Material, Practicum, Evaluation, and Profile. Users are provided with the option to select their preferred menu. The main menu display is shown in Figure 2 as follows:



Fig 2. Main Page Display

3) Instructions Page Display, This instructions page displays instructions on the function of each button contained in the application. The instructions page display is illustrated in Figure 3 as follows:



Fig 3. Instructions page view

4) CP and ATP Page Display, This page displays learning outcomes and learning flows and objectives. The views of the CP and ATP pages are shown in Figure 4 as follows:

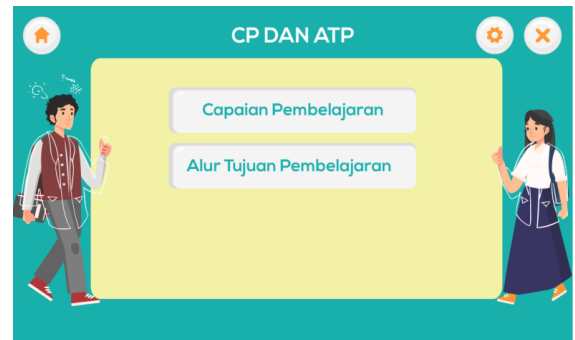


Fig 4. CP and ATP view

5) Material Page Display, This menu presents the material to be learned based on the selected element. The display of the material page is shown in Figure 5 as follows:



Fig 5. Material page view

6) Practicum Page Display, On this page, a practicum simulation is displayed in the form of interactive animations that users can run. The display of the practicum page is shown in Figure 6 as follows:

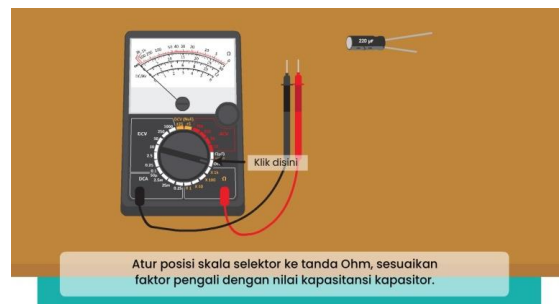


Fig 6. Practicum page view

7) Display of the Evaluation Page, On this page, there are evaluation questions to measure the ability to understand the learning material on this interactive learning medium. The evaluation page display is illustrated in Figure 7 as follows:



Fig 7. Evaluation page view

Data collection instruments obtained in making interactive learning media in Basic Electronics Engineering subjects are as follows:

1) Media Expert Validity Test

Media expert validation consists of two validators. Validator 1 is from an Electronics Engineering Lecturer at Padang State University, and Validator 2 is from an Electronics Engineering Teacher at SMK Negeri 5 Padang. The results of the validation test by media experts, as indicated in the questionnaire, are shown in Table 3.

Table 3. Validation Results from Media Experts

Indicator	Validator 1		Validator 2	
	Score	Max score	Score	Max score
15 Items	64	75	71	75
Percentage	85,33%		94,67%	
Overall Percentage	90%			
Categories	Very Valid			

2) Material Expert Validity Test

Material expert validation consists of two validators. Validator 1 is from an Electronics Engineering Lecturer at Padang State University, and Validator 2 is from an Electronics Engineering Teacher at SMK Negeri 5 Padang. The results of the validation test conducted by media experts, based on the completed questionnaire, are presented in Table 4.

Table 4. Validation Results from Material Experts

Indicator	Validator 1		Validator 2	
	Score	Max score	Score	Max score
15 Items	70	75	74	75
Percentage	93,33%		98,67%	
Overall Percentage	96%			
Categories	Verv Valid			

3) Practicality Test

The practicality test was conducted on students of Industrial Electronics Engineering class X at SMK Negeri 5 Padang. The test was conducted with a small group of 16 students. The results of the practicality test are presented in Table 5.

Table 5. Results of the Practicality Test

User (Student)	Score Obtained	Max score
1	71	75
2	65	75
3	67	75
4	64	75
5	65	75
6	66	75
7	70	75
8	74	75
9	74	75
10	74	75
11	67	75
12	71	75
13	72	75
14	61	75
15	69	75
16	66	75
Total	1096	1200
Na	91,33%	

For the practicality test indicators, namely media design, material, media operation and benefits, there are a total of 15 statement questions. Each indicator will be assessed by 16 students. The assessment results are shown in Table 6.

Table 6. Student scoring based on indicators

No	Indicator	Score	Max score	Average Percentage (%)
1	Media Design	299	320	93,44
2	Material	364	400	91
3	Media operation	216	240	90
4	Benefits	217	240	90,42

B. Discussion

Based on the analysis of the validity questionnaire data from media and material experts, as well as the practicality tests conducted with students, it can be concluded that the interactive learning media for Basic Electronics Engineering, developed using Adobe Animate software, is both highly valid and very practical for use in the learning process, whether online or offline. The average validation score from the two media experts is 90%, and the average validation score from the two material experts is 96%, both of which fall into the "Very Valid" category. The practicality test results, with a score of 91.33%, are categorized as "Very Practical." Thus, the interactive learning media for Basic Electronics Engineering subjects is deemed highly suitable for use by students and teachers. This is supported by research by Miftah Audhiha [13], who also developed learning media based on Adobe Animate, achieved a validity level of 93.1% categorized as "Very Valid" and a practicality level of 86.96% categorized as "Very Practical" in his research. Therefore, interactive learning media for Basic Electronics Engineering subjects, created with Adobe Animate software, is considered highly suitable for use in the learning process.

IV. CONCLUSIONS

Based on the results of the research and analysis previously described, it can be concluded that:

1. Produce interactive learning media in Basic Electronics Engineering subjects that are valid and practical, where the output is an Android application.
2. Interactive learning media in the subject of Basic Electronics Engineering using Adobe Animate software is feasible to use for several things below:
 - a. Validation by media experts obtained an overall percentage score of 90% with a very valid level of feasibility.
 - b. Validation by material experts obtained an overall percentage score of 96% with a very valid level of feasibility.
 - c. The results of the practicality test or trial use by students obtained an overall percentage value of 91.33% with a very practical feasibility level.

REFERENCES

- [1] R. F. A. Risky Oktavian, "Effectiveness of Integrated Online Learning in the Education Era 4.0," *J. Teknol. dan Bisnis*, vol. 3, no. 2, pp. 269–280, 2021, doi: 10.37087/jtb.v3i2.103.
- [2] W. M. Husein, "Teachers' Efforts in Improving the Quality of Learning Through the Application of Information Technology at MI Miftahul Ulum Bago Pasirian," *J. PETISI*, vol. 3, no. 1, pp. 20–28, 2022.
- [3] M. Yaumi, "Instructional Media & Technology," 2018, *PRENAMEDIA GROUP, Jakarta*.
- [4] T. Nurrita, "Development of Learning Media to Improve Student Learning Outcomes," vol. 03, pp. 171–187, 2018.
- [5] H. D. Surnjono, *Interactive Learning Multimedia Concepts and Development*. Yogyakarta: UNY Press, 2017.
- [6] P. Kinanty, K. Kartono, and A. Salimi, "Development of Interactive Learning Media Based on Power Point on Theme 1 Subtheme 3 Animal Growth in Classroom III SDN 36 Pontianak Selatan," *As-Sabiqun*, vol. 6, no. 1, pp. 157–177, 2024, doi: 10.36088/assabiqun.v6i1.4376.
- [7] R. A. Putri, S. W. Utomo, and N. W. Sulistyowati, "Mobile Learning with a Scientific Approach to General Journal Material for Senior High Schools," *Tangible J.*, vol. 5, no. 2, pp. 11–23, 2021, doi: 10.47221/tangible.v5i2.123.
- [8] R. Hidayat, "Development of Interactive Learning Media Based on Adobe Animate with Inquiry Approach on Space Building Material," no. 8.5.2017, pp. 2003–2005, 2022, [Online]. Available: <https://dataindonesia.id/sektor-riil/detail/angka-konsumsi-ikan-ri-naik-jadi-5648-kgkapita-pada-2022>
- [9] S. Maryanti and D. T. Kurniawan, "Development of Stop Motion Animation Video Learning Media for Biology Learning with Picpac Application," *J. BIOEDUIN Progr. Stud. Pendidik. Biol.*, vol. 8, no. 1, pp. 26–33, 2018, doi: 10.15575/bioeduin.v8i1.2922.
- [10] Sugiyono, *Research and development method Reseach and Development R&D*. Bandung: Alfabeta, 2017.
- [11] G. Molina and T. Thamrin, "Development of Augmented Reality-Based Electronic Component Learning Media," *Voteteknika (Vocational Tek. Elektron. dan Inform.)*, vol. 9, no. 4, p. 20, 2021, doi: 10.24036/voteteknika.v9i4.114206.
- [12] F. Sulianta., *Creating Educational Products Using the R&D Method*. 2020.
- [13] M. Audhiha, A. Febliza, Z. Afdal, Z. A. MZ, and R. Risnawati, "Development of Interactive Multimedia Based on Adobe Animate CC on Space Building Materials for Elementary School / Madrasah Ibtidaiyah," *J. Basicedu*, vol. 6, no. 1, pp. 1086–1097, 2022, doi: 10.31004/basicedu.v6i1.2170.