Design of Interactive Learning Media Based on Articulate Storyline 3 in the Subject of Application of Electronics Circuits Class XI at SMKN 1 West Sumatera

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***Abstract* - The importance of interactive learning media in the educational process cannot be underestimated, especially in the context of learning that requires understanding complex and practical concepts. Interactive learning media is able to increase student involvement and support understanding of the material in a more in-depth and interesting way. This research aims to produce interactive learning media based on Articulate Storyline 3 in the subject of Application of Electronics Circuits for class XI Audio Video Engineering at SMK Negeri 1 Sumbar which is valid and practical. The method used in this research is the Research and Development method with the 4D development design. In this study utilized a questionnaire to obtain data on the validity level of learning media. This questionnaire was filled in by two material experts and two media experts. The aspects validated in this development are content aspects (material) and display aspects (media). The results showed that the interactive learning media obtained an average score of 98% from both material experts and 91% from both media experts. The practicality test also utilized a questionnaire with respondents consisting of 15 students. The practicality results obtained an average of 91.87%. From these results, research and development on interactive learning media in the Application of Electronic Circuits subject with the category very valid, very practical, and feasible to use.**

***Keywords*—Interactive Learning Media, Articulate Storyline 3, Application of Electronic Circuits, education, Vocational School.**

I. INTRODUCTION

In Indonesia, education continues to be the government's top priority to build a strong national foundation. The Merdeka Curriculum is one of the innovative steps in education reform that aims to increase the relevance of the curriculum to the needs of the times and develop the characteristics of adaptive and creative learners. This curriculum carries a more integrated, contextual, and competency-based learning concept, with a focus on empowering students to be able to compete in the rapidly changing digital era [1].

The implementation of Merdeka Curriculum in SMK environments, such as in SMKN 1 West Sumatera, aims to prepare students optimally through an interactive and in-depth learning approach. The success of this implementation is highly dependent on the availability of adequate physical and non-physical resources, including learning facilities, technological devices, and relevant teaching materials. However, challenges such as lack of access to effective learning media can hinder the achievement of curriculum goals. The teacher must be innovative in delivering subject materials so that the students enjoy the learning [2].

A good learning and teaching process will affect the learning objectives and also be able to provide satisfying results for student learning outcomes. One way to strive for it is to do innovative learning for example by using learning media. According to Gerlach. media is not just a tool or material. But also a thing that allows students to gain knowledge [3]. The word media comes from Latin, namely Medium which means intermediary or messenger [4]. In general, the word "Media" can be interpreted as an intermediary/tool used to channel an object from one party/place to another party/place [5]. Media is an intermediary tool that facilitates the realization of the goals of school education. The media is able to convey messages as a whole, and is able to solve the problems of teachers and students in the learning process using the media can cause activeness and involvement of students in the learning process. [6]. Media refers to everything, which serves to carry and convey information between the source and receiver of information [7].

Learning is a process of realizing conditions conducive to communication and interaction between teachers and students and other components in teaching and learning activities to achieve learning [8]. Learning is also a form of communication between educators and students with several procedures, facilities and infrastructure in learning as a whole with the support of the learning environment to achieve

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learning goals [9]. Media is an intermediary for educators to convey information that cannot be seen directly by students, but can be illustrated indirectly through the media [10]. Conveying messages to students in learning will be more effective by using media because the information provided is more interesting. Media must be used in teaching materials so that students' enthusiasm for learning increases [11].

Learning media plays an important role in the teaching and learning process, where the quality of the learning process and results is greatly influenced by the accuracy of media use [12]. Interactive learning media, which can be both hardware and software, offers a way to interact with learning materials independently and actively. This media includes various elements such as text, images, sound, animation, and video to achieve learning objectives [13]. Various technology-based applications are found and can be used to support the learning process, in the application of technology-based media, the abilities and skills of teachers are needed from designing to implementing them in learning [14]. One of the potential media to be used in learning is Articulate Storyline, a software that allows the creation of interactive media with a simple appearance and complete features [15].

Learning media plays an important role in improving the effectiveness and efficiency of the teaching and learning process between educators and students. Levie and Lentz identified four main functions of visual media in learning [16]: Attention function: Media helps to attract learners' attention and maintain their concentration on the material presented. Affective Function: Visual media can increase learners' satisfaction and influence their emotions and attitudes towards the material. Cognitive Function: Visual media, such as images, facilitate the process of remembering and understanding the information presented. Compensatory Function: The media helps learners who have difficulty in reading or understanding text by providing additional context through visuals.

The most important characteristic in interactive learning media is that students not only pay attention to the media or objects, but are also required to interact during learning. The characteristics of interactive learning according to Daryanto are: Has more than one convergent media, for example combining audio-visual elements. Interactive, for example the interaction of students with computers. Provides convenience to users without requiring assistance from others / independent.

Articulate Storyline is a software made by Global Incorporation that can be used to produce an interactive learning media. The output that can be produced from Articulate Storyline varies, ranging from formats for IOS, android, and PC users. Articulate Storyline has several advantages that can produce very interesting learning media because in it there are practical menus to be able to add quizzes, so that students in using the media can interact and demonstrate a material that is being studied [17].

Articulate Storyline is suitable for use as learning media that can compete with Adobe Flash media [18]. Articulate Storyline is very interesting as an interactive learning media. The Articulate Storyline program supports features like Adobe Flash in making animations but has a simple interface like Power Point. Articulate Storyline's complete features like Adobe Flash and an interface as easy as Power Point make Articulate Storyline can be utilized as interactive multimedia [19].

Articulate Storyline has several advantages, namely: Does not require a programming language or script in its creation. All animation commands can be done with the trigger menu so that it can facilitate users in creating an interactive learning media. Simple smart brainware makes it easy for users to publish online or offline so that it can be formatted in the form of CDs, word processing, personal pages and LMS [20]. Articulate Storyline as an interactive media that is feasible to use. used in learning. Articulate Storyline-based interactive media based interactive media can be used to assist teachers in the delivery of learning materials and help students to understand the material and encourage students to learn. and help students to understand the material and encourage students in learning activities [21] The use of Articulate Storyline-based learning media has a significant positive effect on student learning motivation and student learning satisfaction. This media helps students understand the material, creates a conducive learning environment, and encourages students to achieve success in the learning process. [22].

Based on the description above, the development of interactive learning media based on Articulate Storyline 3 is considered as a solution that can increase the effectiveness and efficiency of learning. By considering the importance of learning media in the educational process, this study aims to design and develop interactive learning media that can assist in the delivery of material and improve student learning outcomes in the Application of Electronics circuits class XI subject at SMK Negeri 1 Sumbar.

Based on this background, this research is entitled "Designing Interactive Learning Media Based on Articulate Storyline 3 in the Subject of Application of Electronics Circuits Class XI at SMK Negeri 1 West Sumatera" with the aim of producing learning media that is valid, practical, and in accordance with the learning needs at the school.

II. METHOD

The type of research used is Research and Development (R&D) or development research. Sugiyono wrote that the Research and Development (R&D) method is a research method applied to create certain products and test the effectiveness of these products [23]. The development stage of interactive learning media refers to the 4D model proposed by Thiagarajan & Semmel in the Define stage, Design stage, Develop stage, and Disseminate stage [24].

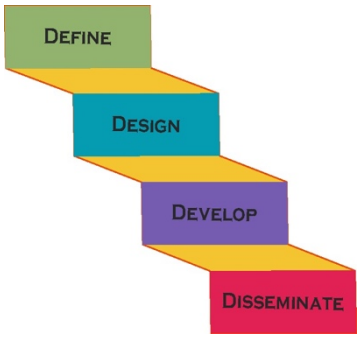

Figure 1. 4D development model

Here are the 4 stages of learning media development:

A. Define

This stage is carried out to collect and determine the needs for the development of learning media. Based on the observations made, it can be concluded that teachers and students of the Electronics Engineering Department of SMK Negeri 1 Sumbar need an interactive learning media in the teaching and learning process. This is so that teachers can convey the content of the subject matter more interestingly, efficiently and effectively so that students will be more interested and understand the content of the material provided.

B. Design

This stage is carried out to determine the design of Articulate Storyline-based learning media in the form of an initial design or storyboard.

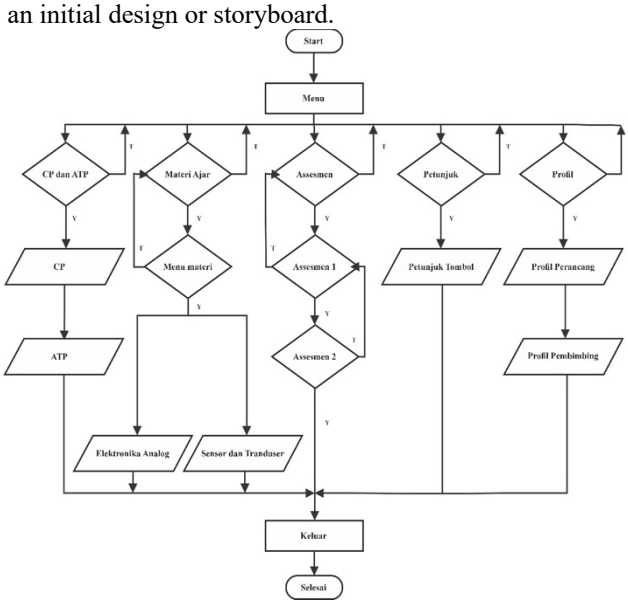

Figure 2. Media Design Flowchart

C. Development

This stage is carried out development on Articulate Storyline-based learning media that has been planned and previously compiled. at the development stage where at this stage several stages are carried out including:

a. Product Development

Product development is the process of making the embodiment of the design stage into a real product.

b. Performance

After the development stage is complete and becomes a product in the form of an application. This learning media was tested repeatedly by researchers before the learning media was reviewed by the supervisor who was then validated by media experts and material experts.

c. Validation

Validation of learning media by media experts and material experts as described above. Validation by media experts and material experts is useful for knowing the feasibility of learning media made and getting suggestions for improvement.

d. Revision

Revision is the stage of animation improvement based on suggestions and input from media experts and material experts obtained at the expert validation stage.

D. Dissiminate

This stage contains activities to disseminate products that have been made and then carried out user trials (Practicality). User trial activities are the stages of activities carried out by providing learning media that have been made to users (students) with the aim of knowing the level of feasibility of learning media by respondents or students. The trial of use was carried out on class XI students of the Application of Electronic circuits subject at SMK Negeri 1 Sumbar.

Research instruments are tools used by researchers in collecting work data to make it easier to process. The instrument used in this research is a questionnaire. Validation data is taken through a validity questionnaire addressed to validators and practicality data is taken through a practicality questionnaire addressed to users or students. Questionnaire is a research instrument that contains a series of questions or statements to capture data or information that respondents must answer freely according to their opinions [25].
The formula used to analyze data on the validity results is:

$$\text{Kelayakan (\%)} = \frac{\text{Skor yang didapat}}{\text{skor yang diharapkan}} \text{ x } 100$$

Description:
Score obtained : Total Score of Respondent's Answer
Expected score : Maximum score per item x number of questions x number of respondents

Table 1. Validation Eligibility Criteria

Score	Criteria
5	Very good
4	Good
3	Medium
2	Bad
1	Very Poor

The practicality results obtained from students are used to measure the usability of interactive learning media. The formula used to analyze data on the results of practicality is:

$$\text{NP} = = \frac{R}{SM} \text{ x } 100$$

Description:
NP : Percent value sought
R : Raw score obtained
SM : Maximum score (Maximum score per item x number of questions x number of respondents)

Table 2. Practicality Category

No.	Achievement level (%)	Category
1.	0% - 25%	Not Practical
2.	25,01% - 50%	Less Practical
3.	50,01% - 75%	Practical Enough
4.	75,01% - 100%	Very Practical

III. Results and Discussion

A. Development Results

The media presented consists of cover, main menu, information, CP and ATP, learning materials, assessment and profile.

a. Cover Page

On the cover page display contains the title of this interactive media, namely "Application of Electronic Circuits" This title serves to provide information about what elements are discussed. On the cover there is also the writing "Audio Vidio Engineering" which provides information about the expertise program.

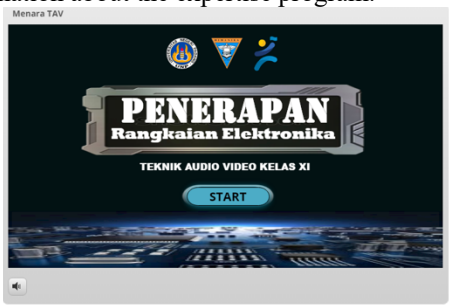

Figure 3. Cover View

b. Main Menu Page

On the main menu page there are buttons that function to direct users to the page to be reviewed. The menus contained on the main menu page are CP and ATP, learning materials, assessments, information and profiles.

Figure 4. Main Menu Display

c. Information Page

On the information page there is information on the use of buttons. Where users can understand the functions of the existing buttons before opening the next pages.

Figure 5. Information Display

d. CP and ATP

On the CP & ATP page contains a learning plan. Where it is divided into 2 pages, namely Learning Outcomes and Flow of Learning Objectives.

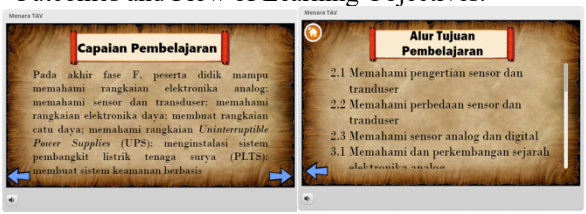

Figure 6. CP & ATP Display

e. Teaching Material

On the material page there is a description of the tranducer sensor material and analog electronics. In the description of the material there are also learning videos on certain pages.

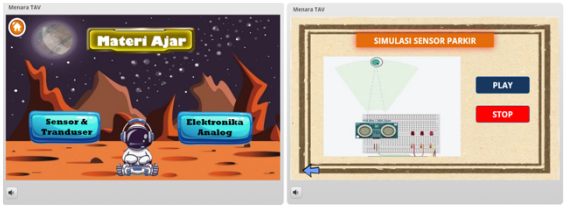

Figure 7. Display of Material Content

f. Assessment

The assessment page is a page that contains a series of questions that students must complete. There are 2 assessments, where each assessment has 10 questions in the form of multiple choices. Users can proceed to the second assessment if they have completed assessment 1 and get a score equal to the specified minimum completeness limit. Learners' scores are shown immediately after completing one assessment.

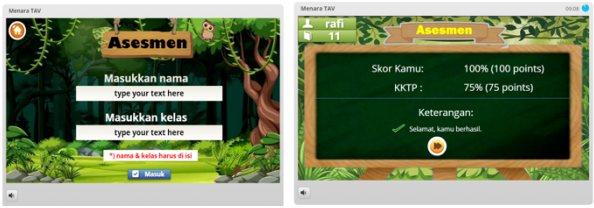

Figure 8. Assessment View

g. Profile

On the profile page there is a designer profile and also a supervisor profile. Users can click on one of the menus to choose whose profile to see.

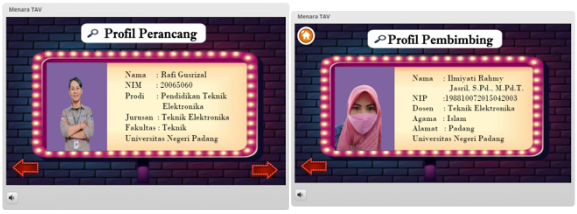

Figure 9. Profile View

B. Validation Results

1. Material Expert Validation

Table 3. Material validity test results

No	Statement	V1	V2
1	The material is relevant to the module	5	5
2	The order of the material	5	5
3	Completeness of material	5	5
4	Appropriateness of providing material examples	4	5
5	5 Informative and communicative language	5	5
6	Images according to the material	4	5
7	Video according to the material	5	5
8	Questions in accordance with the material presented Disajikan	5	5
9	The suitability of the answer key	5	5
10	Evaluation score results can be seen after working on the question	5	5
Total Score		48	50
Total Maximum Score		50	50
Percentage		96%	100 %
Overall Percentage		98%	
Description		Very valid	

2. Media Expert Validation

Table 4. Media validity test results

No	Statement	V1	V2
1	Attractiveness of the opening display	5	4
2	Clarity of instructions	5	5
3	Attractiveness of interactive media design	4	4
4	Ease of button use	5	5
5	Typeface and size easy to read	4	5
6	Interesting song arrangement	5	5
7	Image quality of interactive learning media	4	4
8	Video quality of interactive learning media	5	5
9	Language is interesting and easy to understand	5	4
10	Its use involves students	4	4
Total Score		46	45
Total Maximum Score		50	50
Percentage		92%	90%
Overall Percentage		91%	
Description		Very valid	

3. Media Expert Validation

Table 5. Practicality test results

No	Statement	Score obtained	Maximum Score
1	Responden 1	41	50
2	Responden 2	46	50
3	Responden 3	44	50
4	Responden 4	39	50
5	Responden 5	50	50
6	Responden 6	50	50
7	Responden 7	47	50
8	Responden 8	40	50
9	Responden 9	47	50
10	Responden 10	50	50
11	Responden 11	45	50
12	Responden 12	48	50
13	Responden 13	48	50
14	Responden 14	50	50
15	Responden 15	44	50
Total Maximum Score		689	750
$NP = = \frac{R}{SM} \times 100$		91,87 %	
Overall Percentage		91%	
Description		Very Practical	

4. Discussion

The use of interactive learning media is expected to stimulate students' attention and interest in learning. In addition, it is expected that students can be more independent and active in the learning process. And can improve student learning outcomes. The feasibility of the media can be seen from the results of the assessment of material experts and media experts. In addition, it is also seen from the results of user trials (practicality).

a. Material Expert Validation

Media assessment in terms of material was carried out by 2 experts. Expert 1 assessed the feasibility of the media with a score of 48 with a percentage of 96% and categorized as "Very Valid". Expert 2 assessed the media with a score of 50 with a percentage of 100% and categorized as "Very Valid". The average score achieved from the assessment of 2 validators is 49 with a percentage of 98% categorized as "Very Valid".

From the data from the material expert validation results, the media is relevant to the learning outcomes and flow of learning objectives and is suitable for use in the learning process.

b. Media Expert Validation

Media assessment in terms of media was carried out by 2 experts. Expert 1 assessed the feasibility of the media with a score of 46 with a percentage of 92% and categorized as "Very Valid". Expert 2 assessed the feasibility of the media with a score of 45 with a percentage of 90% and categorized as "Very Valid". The average score achieved from the assessment of 2 validators is 45.5 with a percentage of 91% categorized as "Very Valid".

From the data from the media expert validation results, the media is interesting and also interactive and suitable for use in the learning process.

c. Practicality Test

After media assessment by media experts and material experts. Furthermore, the practicality test or user test is carried out by students. Data Table 14 shows the results of the trial use of interactive learning media. The final value of practicality is 689/750x100% = 91.87% and is categorized as "Very Practical". Learning Media is said to be very practical if it gets an achievement level (%) of 75.01%-100%, according to the practicality category in table 10. From the data obtained, it is known that the interactive learning media for the Application of Electronics Circuits Class XI is "Very Practical".

From the data on the results of media practicality, it can be seen that the media is interesting, can increase student learning motivation, is easy to use so that it can be applied to the learning process. This is in line with the theory of motivation function. Where it reads "By using learning media, students are expected to be more motivated in learning. Therefore, the media should make it easier for students to learn the subject matter so as to increase students' desire to learn" The motivation function becomes more optimal when the media is interesting and easy to use, because students feel more involved and motivated to learn.

This is also in line with research from Nurhamidah (2022) with the title 'Development of Interactive Learning Media Based on Articulate Storyline 3 in Control System Learning Subjects. This reinforces that Articulate Storyline-based interactive learning media is effective in increasing students' motivation and learning independence."

IV. Conclusion

Based on the results of the study it can be concluded that the interactive learning media Application of Electronic Circuits produced is suitable for use. This can be seen from the results of validation by material experts obtaining a percentage of the overall value of 98% with the description "Very Valid". Validation by media experts obtained a percentage of the overall value of 91% with the description "Very Valid". The results of the practicality test or user trial by students obtained an overall percentage value of 91.87% with the description "Very Practical". In addition, the resulting media is able to attract the attention of students and increase student learning motivation.

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