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DEVELOPMENT OF INTERACTIVE LEARNING MEDIA USING SMART APPS CREATOR IN THE SUBJECT OF TELECOMMUNICATION ACCESS NETWORK ENGINEERING CLASS XI AT SMKN 1 REJOTANGAN

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***Abstract*— Education plays a crucial role in improving human resource quality, especially in the digital era where technology significantly influences learning. Integrating Smart Apps Creator as an interactive learning tool allows for a more engaging learning experience by combining text, images, audio, video, and animation in a single platform.This study aims to develop interactive learning media using Smart Apps Creator for the Telecommunications Access Network Engineering (TJKT) subject at SMKN 1 Rejotangan, following the ADDIE model (Analyze, Design, Develop, Implement, Evaluate). Observations indicate that TJKT instruction still relies on conventional methods, limiting student engagement. Given that students frequently use Android devices, technology-based learning solutions are deemed necessary.Validation results confirm the high feasibility of the developed media. The first media expert evaluation scored 88% ("Excellent"), while the second evaluation scored 84% ("Good"). The subject matter expert assessment reached 82% ("Good"), with small group testing at 90% and large group testing at 87% ("Excellent").These findings highlight that Smart Apps Creator enhances student engagement and learning effectiveness, offering a relevant, applicable, and industry-oriented learning experience for vocational education.**

Keywords*— *Education, Interactive Learning Media, Smart Apps Creator, Telecommunications Access Network Engineering, ADDIE Model

I. INTRODUCTION

Education has an important role in improving the quality of human resources and continuing to adapt to rapid technological developments. Technological advances have a diverse influence on various aspects of life [1]. The existence of technology provides opportunities to expand and enrich students' learning experiences, in addition to technology having positive and negative impacts, it also provides its own challenges, especially in the field of education [2]. The application of technology in the learning process can increase the effectiveness, efficiency, and quality of learning itself. While technology provides opportunities to expand and enrich students' learning experiences, there are also positive and negative impacts that are challenging for the world of education.

The use of media in learning is one of the alternatives for teachers in helping and making it easier for students to understand and learn the material taught [3]. The use of technology-based interactive learning media is increasingly in demand in the world of education. Interactive learning media is audio visual media in the form of images, sounds, and animations supported by computers or gadgets to support learning objectives [4]. The types of learning media are as follows; a. presentation, b. learning videos, c. simulation, d. mobile applications [5]. One of the software that can support interactive learning is Smart Apps Creator. Smart Apps Creator is a software that can create a variety of mobile, desktop and web-based apps [6]. The use of Smart Apps Creator can improve the understanding of mathematical concepts and is very feasible to apply in learning [7]. However, the application of Smart Apps Creator in the subject of Telecommunication Access Network Engineering at the vocational school level is still very limited, so this study aims to fill this gap.

Based on the results of observations at SMKN 1 Rejotangan, learning still uses a lot of conventional media such as books and student worksheets, which are less able to increase student participation in the classroom. So that the development of interactive learning media is an important aspect to improve students' understanding and skills. Many students at the school use Android devices in their daily activities, so the development of technology-based interactive media is a relevant solution. Android is an operating system for Linux-based mobile devices that includes OS, middleware, and various applications [8]. The results of this research are expected to be a reference for teachers, schools, and other education personnel in developing technology-based learning methods that are more interesting, applicable, and in accordance with educational needs in the digital era.

II. RESEARCH METHODS

A. Research Model

This study uses the R&D (Research and Development) research method by applying the ADDIE model. The R&D method is a research method that produces innovations, either a new product or developing an existing product to be more attractive in accordance with the learning objectives of a certain subject [9]. The stages of ADDIE consist of 5 stages, namely; Analyze, Design, Develop, Implement, and Evaluate [10].

B. Research Procedure

In the analysis stage, the researcher conducts an in-depth analysis to identify the main problems underlying the need for the development of learning media. The analysis was carried out based on the results of observations and observations that have been made by the researcher [11]. This process aims to understand the needs of learning as a whole, both in terms of students, teachers, and the learning context itself. This analysis is the main foundation in determining the direction of learning media development to suit the needs and goals of learning. The analysis carried out was needs analysis and curriculum analysis.

At the design stage, learning media is designed to be adjusted to the results of the analysis stages that have been carried out previously. Design is the second stage in the ADDIE model, where at this stage planning for media selection begins [12]. This design aims to ensure that learning media can meet the needs that have been identified at the analysis stage. To describe the process and function of the media to be developed, a use case diagram is used. These diagrams help identify the actors involved as well as their interactions with the system.

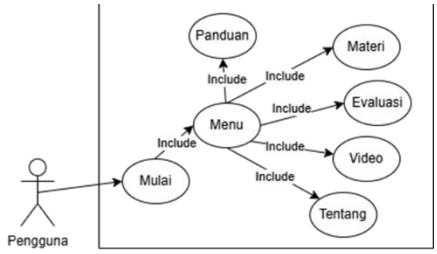

Fig. 1. Use Cases Learning Media

In the development stage, the development stage is a development process that includes the preparation of learning media [13]. The final result of this stage will produce a learning media that is ready to be implemented. Furthermore, the media will be assessed by media experts and subject matter experts to obtain suggestions for improvement and development of learning media.

At the implementation stage in this study, the design and methods that have been developed are applied in real situations in the classroom [14]. Interactive learning media will be tested on TJKT students at SMKN 1 Rejotangan during the learning process. The researcher collaborates with the subject teacher to incorporate this media into the regular learning process. In this process, students will be given a questionnaire that aims to find out the advantages and disadvantages of the products that have been made.

In the evaluation stage, the evaluation stage is the final stage in the research which aims to assess the success of achieving product goals and objectives through analysis and conclusions from the results of the questionnaire of experts and students [15]. Through this stage, an analysis is carried out on the advantages and disadvantages of the media that has been implemented, as well as to identify aspects that need to be improved or improved. The evaluation was carried out by collecting data through the results of questionnaires that had been given to students and validators.

The data collection technique using questionnaire sheets is descriptive. The questionnaires used were questionnaires of media experts, subject matter experts and student questionnaires. The data obtained from questionnaires of media experts, subject matter experts and students is in the form of quantitative which will be calculated to determine the obtaining of scores. Then to find out the feasibility in the form of a percentage using the formula:

$$P(\%) = \frac{Total\ score\ obtained}{Maximum\ Score} \times 100\% \quad (1)$$

Then the calculation results will be compared using the score table in table 1:

TABLE I. SCORE PERCENTAGE

No.	Percentage	Qualification
1	85% - 100%	Excellent
2	75% - 84%	Good
3	65%-74%	Enough
4	55% - 64%	Not Good
5	0% - 54%	Very Bad

III. RESEARCH RESULTS

The results of the research obtained from this development are learning applications about the introduction of fiber optic cables as a learning medium for the introduction of telecommunication network devices. This learning application is designed to support the teaching and learning process by utilizing mobile technology based on Android smartphones. The following research procedures are used by researchers to develop applications and obtain data to support application development.

A. Analyze

Based on the results of observations and interviews with Mr. Anandia Abdul Abidin. S. T which was carried out at SMKN 1 Rejotangan in class XI TJKT 2. Getting the results that learning in class XI TJKT 2 still uses teaching media in the form of books and presentation slides, telecommunication access network engineering subjects using an independent curriculum, more than 90% of students use android devices

which this greatly supports the development of learning media.

Based on the results of the analysis, the following are the functional and non-functional needs for the developed learning media:

Functional Needs

- The media should have interactive elements such as simulations, quizzes, and responsive navigation.
- Provide telecommunication access network engineering materials.
- Media provides an exam or quiz feature to measure student understanding.

Non-functional needs

- The application can be run with minimum specifications of android lollipop with a minimum of 4gb of RAM.
- Applications can run smoothly at the minimum spec without lag.
- The app size isn't too large to keep it lightweight for devices with limited space.

B. Design

In the design stage, the researcher designed an interactive learning media using Smart Apps Creator which was tailored to the learning needs of the subject of Telecommunication Access Network Engineering class XI in SMKN 1 Rejotangan. This planning process involves the following steps:.

- Content design, this learning media content is designed with the aim of providing an interactive and enjoyable learning experience for students. The material provided covers various important elements that support an in-depth and applicable understanding of concepts, especially in the field of telecommunication access network engineering.
- Media Element Creation, creating learning media elements is an important process in creating engaging, effective, and interactive content. These media elements are designed with a strategic approach, in order to be able to meet learning objectives and support various learning styles of students. For a view of how users interact with learning media, see Figure 1.

C. Develop

The development stage is the stage where the process of making learning media that has been designed at the previous stage and will be tested on media experts and subject matter experts. The media display can be seen in table 2.

TABLE II. MEDIADISPLAYRESULTS

Picture	Description
	Strat Page, on this page displays the start page before entering the home page. On this page it contains the logo before entering the next page.
	This page displays a button to go to the Home page
	This page contains buttons to go to the desired page. Such as the button: • Guide • Content • Video • Evaluation • About Us On this page, there are also sound buttons to turn background sounds on and off.

D. Testing Media

After the media is developed, the media will be tested by media expert 1, media expert 2 dan subject matter expert. Media expert 1 is Mrs. Yelma Dianastiti, Mpd., media expert 2 is Mr. Dr. H. Abdul Haris Idrakusuma, M.Pd. and subject matter expert is Mr. Anandia Abdul Abidin .S.T. The results of the test of the media can be seen in table 3:

TABLE III. MEDIAEXPERTTESTING

No.	Validator	Percentage	Qualification
1	Media Expert 1	88%	Excellent
2	Media Expert 2	84%	Good
3	Subject Matter Expert	82%	Good
	Average	85%	Excellent

E. Implementation

At the implementation stage, this product is used to determine the user's response to learning media to assess the feasibility of the product. This product assessment uses a questionnaire given to students to assess the learning media products used. This learning media test has two stages, namely, a small group test and a large group test. The results of the small and large group test can be seen in table 4:

TABLE IV. SMALL&LARGEGROUPTESTING

No.	Validator	Percentage	Qualification
1	Small Group	91%	Excellent
2	Large Group	89%	Excellent

Average	90%	Excellent

F. Evaluation

Product evaluation is carried out to correct shortcomings in learning media that have been developed to become better products. The suggestions for improving the product can be seen in the table 5.

TABLE V. SUGGESTION

No.	Validator	Suggestion
1	Media Expert	• Fix on media instructions • Home button display on the evaluation page is less visible
2	Subject Matter Expert	• Add pictures in the material to make it easier for students to understand the material

IV. CONCLUSION

Development of Interactive Learning Media Using Smart Apps Creator in the Telecommunication Access Network Engineering Subject Class XI at SMKN 1 Rejotangan uses the ADDIE model development model consisting of Analyze, Design, Develop, Implement and Evaluate. This study obtained the percentage results of the media expert test 1 got 88% with the criterion of "Very Good", the results of the media expert test 2 got 84% with the criterion of "Good", the results of the subject matter expert test 82% with the criterion of "Good", the results of the small group test 91% with the criterion of "Very Good", the results of the large group test 89% with the criterion of "Very Good".

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