

## DESIGN OF AUGMENTED REALITY AS A LEARNING MEDIA APPLICATION ON NETWORK TOPOLOGY AND NETWORK TOPOLOGY LESSONS IN VOCATIONAL MIDDLE SCHOOL

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### Abstract

This research is the initial stage of a research on learning media, namely the design of the learning media itself. In this study, it will be explained and attached what underlies the author to design a learning media, especially 3D-based media combined into an android application, with the ADDIE method which will be the basic method of design to field research, namely in vocational high schools in topology subjects. network. but in this study it is limited to the design of the application itself first as the first step in seriousness in carrying out this ADDIE research and design method. which is later expected that if the initial design of an application concept as a learning media can be well received, a study will be made and developed which specifically examines the feasibility, effectiveness and validation survey of this application itself so that later this study is expected to be further developed and developed. more in the future

**Keywords:** Application, ADDIE ,Augmented Reality, Learning Media

### Introduction

Based on the curriculum at SMK, computer basic network is a basic subject for Computer and Network Engineering vocational competence. This subject contains material ranging from introducing the types of networks to layer structures and network topologies. At the time of observation, it was seen that the delivery of basic computer basic network material in Vocational High Schools is currently still using a system like schools in general, namely the teacher conveys material in front of the class by means of a blackboard with markers to provide examples or illustrations to their students. With the delivery of learning materials as above, the quality of knowledge imparted to students tends to be monotonous and less than optimal. Students will find it difficult to understand or accept the lesson. During the current pandemic, teaching and learning activities are less effective.

Therefore, it is necessary to support other activities that can make teaching and learning activities good even though they are not face to face. By using augmented reality students can interact with digital content that can increase imagination, creativity and learning (Persefoni & Tsinakos, 2015: 52). Students are expected to understand learning

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well using applications that can be used during distance learning using smartphones or PCs owned by students. With this application, it is hoped that teachers can be helped in achieving the expected learning objectives. So that later the object model from learning related courses will be designed and an interface design will be made which will be used as a reference for developing this application.

### Research Method

The method used in this research is the ADDIE method which is limited to the Design stage. According to Czaja & Sharit (2013:178) that ADDIE (Analysis, design, development, implementation, and evaluation) represents a large scale systematic framework for providing instruction, which means ADDIE is a systematic framework on a large scale to provide instructions. "In practice, there are several adaptations of the ADDIE model, but in general it consists of 5 phases that make up a cycle, namely Analysis, Design, Development, Implementation, and Evaluation" (Sukenda, et al. 2013:186). The description of the stages of the ADDIE development model is as follows:



#### A. Analysis Phase (Analyze)

The analysis phase includes the following activities: (1) conducting an analysis of the competencies required of students; (2) analyzing the characteristics of students regarding their learning capacity, knowledge, skills, attitudes that have been possessed by students and other related aspects; (c) conduct material analysis in accordance with the demands of competence. The analysis phase involves three questions that must be answered completely.

#### B. Design Phase (Design)

The design phase is carried out with the following terms of reference: (1) for whom the learning is designed (students); (3) what skills do you want to learn (competencies); (2) how the subject matter or skills can be learned well; (4) how do you determine the level of mastery of the lesson that has been achieved (assessment and evaluation).

#### C. Development Stage (Development)

The third stage is the development activity which in essence is the activity of translating the design specifications into physical form, so that this activity produces

a prototype of the development product. Everything that has been done at the design stage, namely the selection of materials according to the characteristics of students and the demands of competence, the learning strategies applied, and the forms and methods of assessment and evaluation used are realized in the form of prototypes.

#### D. Implementation Phase (Implementation)

The fourth stage of activity is implementation. The results of the development are applied in learning to determine the effect on the quality of learning which includes the effectiveness, attractiveness and efficiency of learning. Product development prototypes need to be tested in real terms in the field to get an idea of the effectiveness, attractiveness, and efficiency of learning.

#### E. Evaluation Stage (Evaluation)

The last stage is to conduct an evaluation which includes formative evaluation and summative evaluation. Formative evaluation is carried out to collect data at each stage used for refinement and summative evaluation is carried out at the end of the program to determine its effect on student learning outcomes and the quality of learning in general.

### Result and Discussion

#### 1) Interface Design of page loading

The loading page is the start page when the application is run for the first time.



**Figure 2.** *loading page*

#### 2) Interface Design of menu page

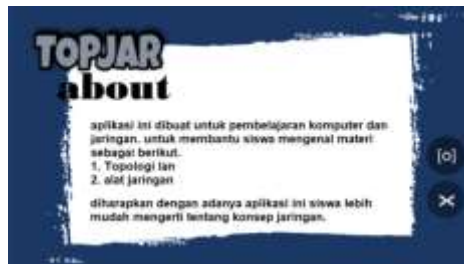
On this application page will display several menus that can be used by the user in understanding the material being studied. Like the start menu, about, help, and quizzes.



**Figure 3.** *Home Page*

### 3) Interface Design of About Menu

Halaman tentang aplikasi ini berisi informasi dari aplikasi yang dijalankan. Halaman tentang atau *about* ini akan berjalan jika user menekan tombol *about* pada menu awal.



**Figure 4. About Page**

### Conclusion

Augmented Reality-based media is a media that focuses on the appearance of objects that look almost real with 3-dimensional modeling based on actual objects, where this good media has been developed previously to help humans understand an object without the need to try to find the object to be understood first. formerly. So that during this pandemic, Augmented Reality-based learning began to be developed for practical lessons where students will be able to recognize and understand the modeling of objects from the practicum without having to go to schools that cannot be carried out offline. Therefore, an Augmented Reality android application was designed as an early stage of development and manufacture of intermediate stage applications later.

Recommendation describe things that will be done related to the next idea of the research. Barriers or problems that can influence the results of the research are also presented in this section.

This section can be written in case there are certain parties need to be acknowledged, such as research sponsors. The acknowledgment must be written in brief and clear. In addition, avoid hyperbole acknowledgment.

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