Development of Physics Learning Media at High School Level by Using Computer Assisted Instruction Model

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Abstract. Today's technological advancements have brought about a number of changes, including in the field of education, where the idea of e-learning was born as one of the electronic learning resources that enables students to get instruction more rapidly. Education is the process of using instruction and training to help a person or group of people change their attitudes and behaviors in order to become more mature human beings. The advancement of a country is significantly influenced by education. As a result, a country cannot progress without high-quality education. In SMA Swasta Teladan Medan physics class X semester I, the knowledge of straight motion kinematics is instrumental for students to build their ability to understand the material. Research reveals that students have difficulty understanding the Straight Motion Kinematics material. The delivery of material provided by teachers to students tends to be monotonous and boring, causing students disinterested in learning it. The development of integrated information technology, including communication, audio, video, and graphics packaged as multimedia, is known as computer-assisted instruction (CAI). Every class can incorporate the Computer Assisted Instruction learning paradigm in a variety of ways, such as presenting content and interacting with students by displaying tutorials, either one-on-one or in small groups. This educational medium is developed using the CAI model and a waterfall process.

Keywords: Learning, Physical Science, Straight Motion Kinematics, Computer Assisted Instruction, Waterfall

1 Introduction

MBKM is the current curriculum in the field of education. It is focused on the competency of students' abilities, which comprise information, skills, attitudes, and values that are expressed in thought and behavior patterns. The current MBKM curriculum calls for infrastructure and facilities that facilitate a successful learning process in the classroom, including the teacher's proficiency with the subject matter and the implementation of effective teaching strategies to prevent student and teacher boredom. The advancement of a country is significantly influenced

ICIESC 2024, September 17, Medan, Indonesia

DOI 10.4108/eai.17-9-2024.2353109

by education. As a result, a country cannot progress without high-quality education. In SMA Swasta Teladan Medan physics class X semester I, knowledge of Straight Motion Kinematics is very useful for students to build their ability to understand the material. Research reveals that students have difficulty understanding the Straight Motion Kinematics material. The delivery of material provided by teachers to students tends to be monotonous and boring, causing students' disinterest in learning it [8].

One of the numerous changes brought about by today's technological advancements is the emergence of the idea of e-learning, which is one of the electronic learning resources that enables students to get instruction more rapidly. The development of integrated information technology, including communication, audio, video, and image packaged as multimedia, is known as computer-assisted instruction [1,2]. It can provide content and engage students by displaying tutorials, either individually or in small groups, by incorporating the Computer Assisted Instruction learning model into the learning concept in each session in a variety of ways [3,7]. In order to improve the effectiveness and efficiency of the teaching and learning process, it is anticipated that the learning materials included in this computer application will be more inventive and diverse [4]. where professors and students connect not just in person but also through computer media, which is a learning tool that has been presented as engaging as possible to support both parties. Based on the background information and avoiding a detailed discussion of the aforementioned subjects, the authors formulate a number of issues that will be discussed, including whether the learning media created is useful and successful in its implementation and whether it is feasible to use it in high school physics classes using the Computer Assisted Instruction model [5,6].

2 Method

In researching the development of learning media by applying the Computer Assisted Instruction model, a concept or research flow needs to be carried out which can be seen in Figure 1 below:

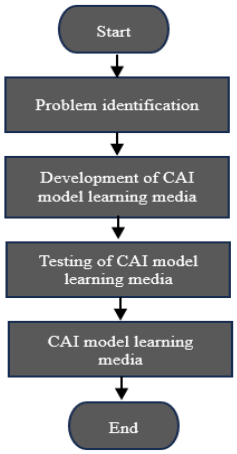

Fig.1. Research flow chart

Development Model

The waterfall approach, also known as the "classic life cycle," is a systematic and sequential approach to software development that begins with the specification of user requirements and progresses through the phases of planning, modeling, construction, and system delivery to users (deployment), culminating in support for the entire software produced [9].

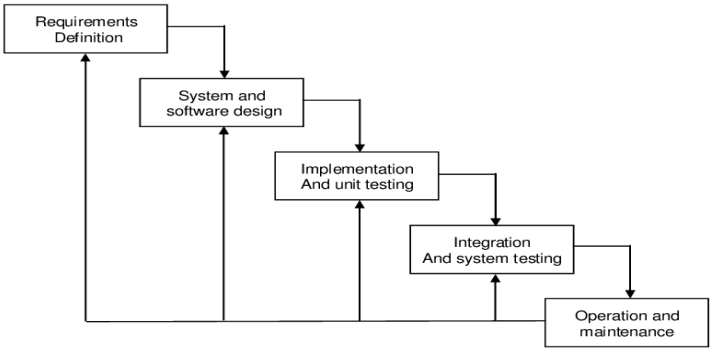

Fig. 2. Waterfall Development Model

3 Results and Discussion

To form students' understanding ability in learning, learning media is designed using a scientific approach, practicing evaluation questions that demand skills, and making meaningful learning in the developed learning media.

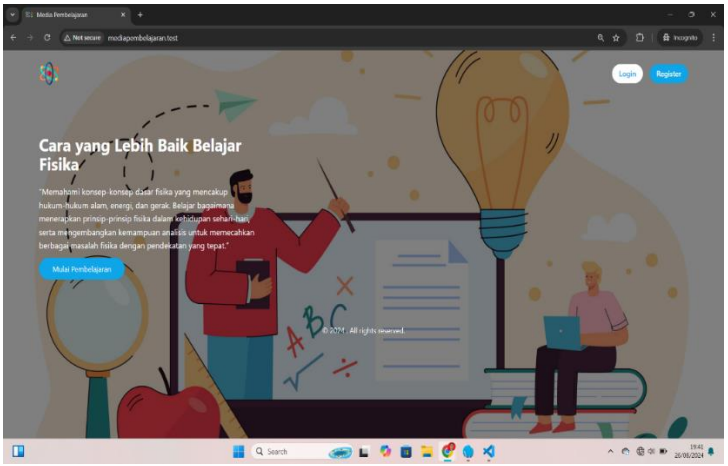

Fig. 3. Learning Media Home Page

The main page introduces the Learning Media to the user. This page is designed to capture the user's interest by briefly presenting the physics learning topic and inviting the user to start learning.

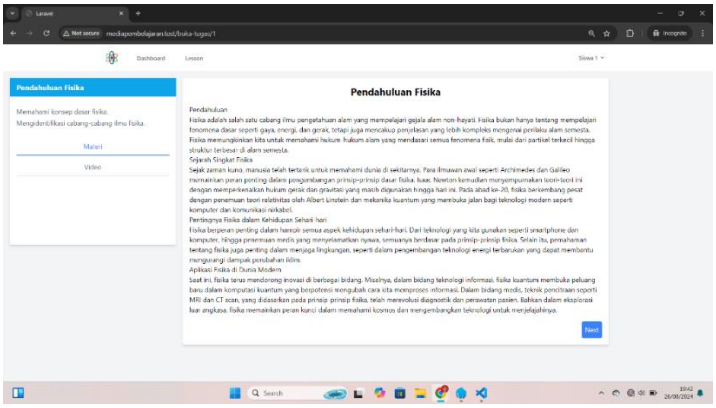

Fig. 4. Learning Materials Menu

A page that displays details of the course materials, including text and learning videos. Materials Navigation Pane Displays links to various sections of the course materials. Users can choose to view 'Materials' or 'Videos'. Matter Content: Displays the text content of the subject matter. Users can read in-depth explanations of the topics learned.

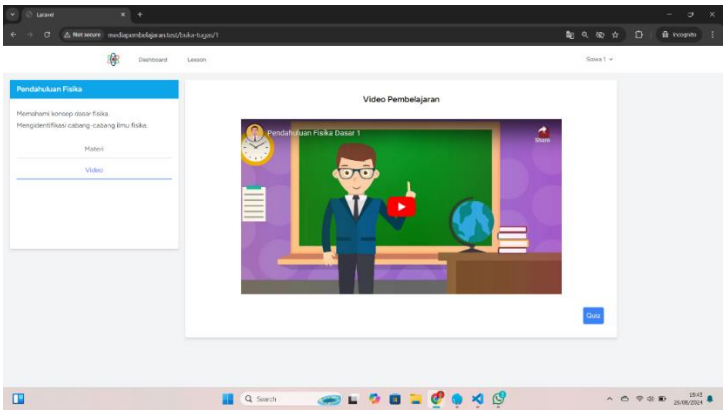

Fig. 5. Learning Video Menu

A page that displays learning videos related to the lesson topic. Video Player displays learning videos. Users can play the video to visually understand the lesson topic. 'Quiz' button: Directs users to the corresponding quiz. After watching the video, users can directly take the quiz to test their understanding.

4 Conclusion

Based on the description above regarding the learning application of physics subjects at the senior high school level with the computer-assisted instruction method that has been made by the author, then in displaying the theory of physics subject learning applications regarding the kinematics of straight motion. The topic of discussion is motion, distance and displacement, velocity and speed, acceleration and progress, regular straight motion, regular changing straight motion, and free fall motion, and presents multimedia nuances in the form of sound and animation in accordance with the topic of discussion. Applying the method of Computer

Assisted Instruction or computer-based learning can be implemented in the application of learning physics subjects at the high school level where this application can be used individually and this application consists of tutorials, drill and practice, games and simulations.

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