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Research paper



Applying the Learning Multimedia Applications for Completion of Linear Equations with Subscription Methods

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Abstract

The progress of communication and information technology needs to continuously adapt to various disciplines where one of them is education. This progress will undoubtedly give hope for changes in the learning process that is getting better by using multiple approaches to strategies, methods, teaching materials and media as well as assessment systems in learning, including in solving linear equations. The main problem that arises in solving linear equations in schools is the low ability of students to count and the learning system; this is because the learning conducted in schools is still using the books as media. Learning systems of linear equations usually taught through books seem very saturating. The teachers are necessary to design an exciting and interactive learning application to explain the linear equations system. Therefore to support the learning needs to be developed informative and creative learning applications so that it is easy to learn. Computer Assisted Instruction (CAI) is a method of vocational training approaches whose primary emphasis is on what a person can do as a result of training. It is hoped that this learning application can help students understand and increase students' enthusiasm and motivation to learn the two-variable linear equations system.

Keywords: *Learning Application, Multimedia, Computer Network, Computer Assisted Instruction*

1. Introduction

Today's education has an essential role in encouraging students' intentions in studying quadratic equations, technological adaptations, and their distribution. The progress of communication and information technology is currently widely applied to various disciplines, including education [1][2]. The process of teaching and learning for the subjects of linear equations of two variables in schools has so far been using text-based learning methods that are conveyed to the media so that students feel bored quickly[3]. It needs to be designed for an informative and creative learning application so that it is exciting and easy to learn [4]–[7].

The role of multimedia and technology in learning is significant, where the critical part is to create media and links using computers[2], [8]–[10]. This role allows students to develop multimedia projects [11], [12]. Multimedia applications used for educational purposes according to Vaughan a combination of text, graphics, animation, audio, and video [13]. Multimedia also refers to the use of computer technology to create, store, and experience multimedia content. By utilizing computer technology as a tool, these application teaching aids are expected to help students understand the two variables 'linear equations and increase students' enthusiasm for learning them.

2. Theoretical Framework

2.1. Learning Media

Multimedia applications are used by teachers and lecturers to convey information such as lecture slides, assessment materials, and other learning resources. This application can also be used by students to learn new skills and knowledge without the guidance of teachers and lecturers. According to Steinmetz and Nahrstedt, multimedia applications move from one PC environment to a multi-user environment or a personalized user environment [14]. Growth in information and communication technology is so fast, and the use of multimedia applications has brought changes to computing, entertainment, and education. However, educational multimedia applications will not replace the role of teacher or

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lecturer; it will only allow students to learn more when compared to traditional teaching methods[15].

2.2. Computer Assisted Instruction (CAI)

The advent of computers in the 1950s placed the basis for CAI computer-aided learning) until the 1960s and 1970s. However, it was only in 1980 that computers began to make a significant impact on education [16]. The initial application of computer resources includes the use of simple simulations. This initial simulation has little graphics ability and only slightly improves the learning experience [17].
The application of Computer Assisted Instruction (CAI) and multimedia methods in this learning is undoubtedly to provide a continuous and detailed form of education [4], [9], [18]–[20]. So that students or users can understand the topic of learning as a whole. In the model and exercise section found in the Computer Asset Instruction (CAI) method [21], it will help the user to know how the user understands the material available[22]. Giving value will also affect the user's interest in learning. Each user will try to get the best value for education.

3. Design Model

3.1 Flowchart

The flowchart is a chart that shows the sequence and relationships between processes expressed by symbols. A connecting line represents the relationship between processes. With the diagram, the order of the activity process becomes more explicit. If there are additional processes, it can be done more efficiently.

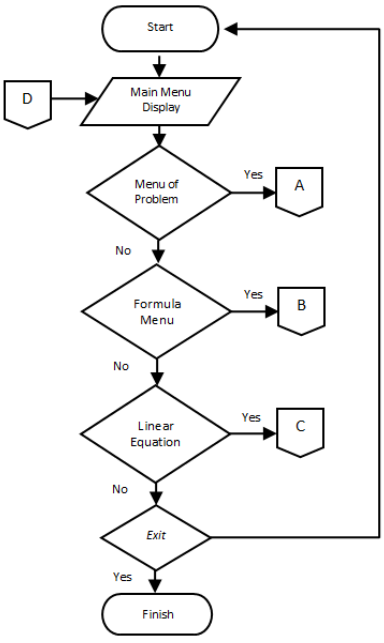


Fig. 1: Flowchart main menu

3.2 Designing by Using *Use Case Diagram*

Use case identification is done to determine what the actor is doing in a system [23]. External entities that use this application are only users. This application serves one actor is the user. Users can simulate questions, formulas and sample problems, apply linear equations to 2 variables, and exit. The following is explained in the figure below.

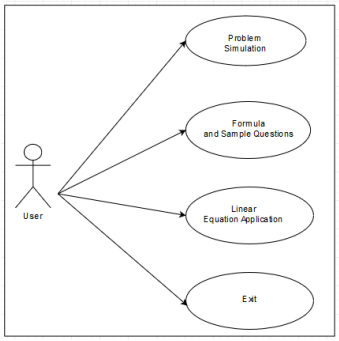


Fig. 2: *Use Case* Diagram Learning application of substitution of linear equations method

3.3 Design Main Menu Interface

The system interface design consists of the design of the login page interface, the problem simulation menu, the formula menu and the sample questions, the Linear Equation Application menu, and the Exit menu.

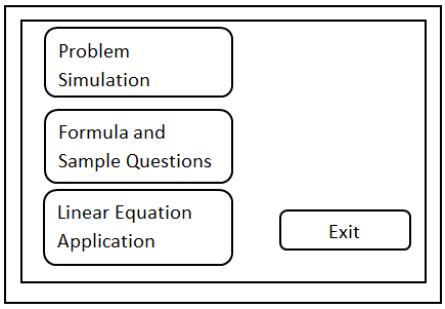


Fig. 3: Design of main menu page

4. Result and Discussion

Computers as a tool in learning and at the same time running applications must be supported by facilities or specifications that support the process of application performance that is designed to run well. To produce an application program, the first thing that must be understood is the algorithm. Algorithms are logical steps used to solve problems.

4.1 Algorithm of Main Menu

Start
If the "Problem Simulation" button is pressed then
Display the Simulation Menu Page
End if
The "Material and Sample Problem" button is pressed then
Display Menu Formulas and Sample Questions
End if
If the "Application of Variable 2 Linear Equation" Button is pressed then
Appear Menu Application Linear Equation 2 Variables
End if
If the "Exit" button is pressed then
Show out Confirmation Page
End if
Finished

4.2 Main Menu Display

In this view, it consists of 4 buttons in the form of the Problem Simulation Menu, Menu Formula and sample questions, Application Menu of Linear 2 Variable Equations, and Exit Menu. The Main Menu view can be seen in Figure 4 below.

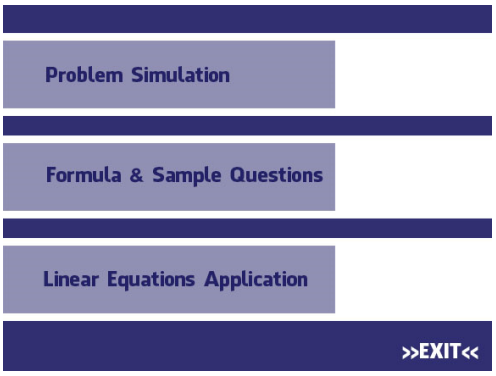


Fig. 4: Main menu display

4.3 Menu Display of Problem Simulation

This view contains multiple choice questions about linear equations. Before entering the problem, the user first fills the name in the place provided. Then to open the first problem the user must click on the enter button. The Display Simulation Menu Problem can be seen in Figure 5a. After the user clicks, the first question page appears. In this view, the user must answer the question by selecting one of the correct answers on the radio button then clicking enter to display the next question. The first question page view can be seen in Figure 5b. Later in the last question, if the user clicks on the enter button, an evaluation display will appear which serves as an assessment of the issues that have been answered and at the same time as feedback for the user.

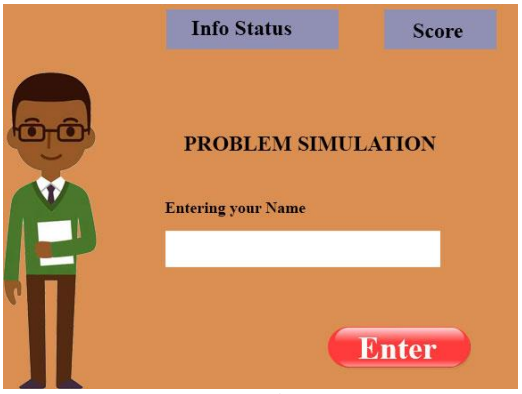


Fig. 5a: Menu display of problem simulation

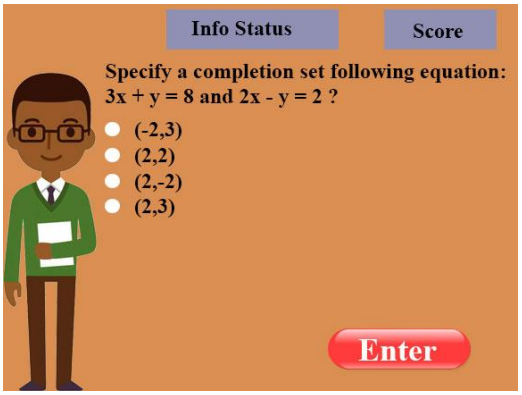


Fig. 5b: Menu of problem simulation

4.4 Application Menu display of Linear 2 Variable Equations

On this page, the user must fill in the number in the space provided. On this page, there arealso two buttons that have their respective functions, namely: the check button and the process button. The process button itself functions to process the calculation of linear equations. The check button functions to find out how the calculation steps of the linear equation are two variables. Display of the application menu page linear equation two variables can be seen in figure 6 below.

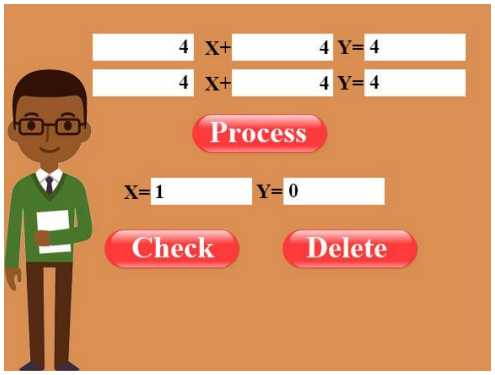


Fig. 6: Application menu display of linear 2 variable equations

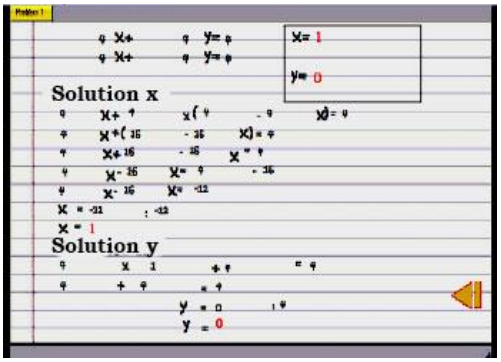


Fig. 7: Solution Menu display of Linear 2 Variable Equations

4.5 Display of Exit Menu

This display contains two buttons as confirmation to exit the application. The two buttons are the ”yes” button to exit the application and the “no” button to stay on the form and return to the main menu. The exit menu page can be seen in Figure 8 below.

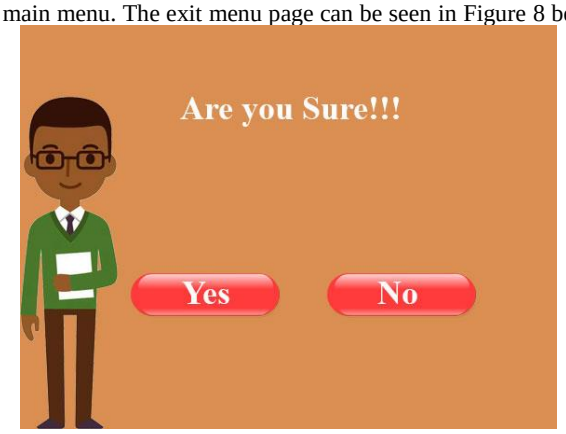


Fig. 8: Display of exit menu

5. Conclusions

Based on the results of this research, it can be concluded that in designing the learning application design there must be a good one. As for what must be inserted is to determine the subject matter, create the display, design background images, identify and select pictures and other supporting components, combine all ingredients into single interface design. This application program is

learning that aims to enable students to understand the Linear 2 Variable Equation System.

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