INNOVATION IN ACTION: TURNING IDEAS INTO REALITY

Chapter 19

Computer System Hardware Installation Learning Application "Tech Tutor"

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ABSTRACT

Basic knowledge of computer systems is essential for understanding how hardware and software function. As computer usage grows, it is increasingly important for students and general users to be aware of computer system basics. However, traditional learning methods are often constrained by time and location, making it difficult for individuals to access flexible learning opportunities. Additionally, the reliance on printed reference materials contributes to resource waste and environmental harm. To address these issues, this project developed a virtual learning application focused on basic computer hardware installation. The application is accessible anytime and anywhere, eliminating the need for physical materials. It provides illustrated notes, step-by-step instructional videos, and interactive quizzes to enhance understanding. The app promotes safe installation practices and supports effective self-paced learning. The development process followed the ADDIE model and used Android Studio and Visual Studio Code as development platforms. To evaluate its effectiveness, the application includes a quiz-based assessment system that measures user knowledge after completing the learning modules. Findings from user feedback indicate positive experiences and increased knowledge levels, suggesting the app effectively supports learning outcomes. In conclusion, this virtual learning application simplifies the process of learning hardware installation while promoting digital education, reducing costs, and minimizing environmental impact. It aligns with current educational priorities by offering a sustainable, accessible, and efficient alternative to traditional methods, making computer education more flexible and environmentally responsible.

Key Words: Learning Application, Computer Hardware, Hardware Installation, Virtual Learning, ADDIE

1. INTRODUCTION

The "Tech Tutor" learning application is designed to educate users about computer hardware components such as laptops, monitors and other essential devices that are increasingly integrated into daily life. While developed primarily for vocational college students as a

supplementary learning resource beyond class hours, it is also beneficial for anyone interested in gaining hardware knowledge, regardless of age or educational background. This application provides structured access to instructional notes, reference materials, installation guides and critical safety procedures to ensure proper handling of hardware components. Interactive learning activities, including quizzes, help assess users' understanding and reinforce key concepts. The development of the app followed a systematic process, including problem analysis, design planning, implementation and testing, incorporating survey feedback to refine its features. Ultimately, "Tech Tutor" offers a convenient and effective way for students, educators and tech enthusiasts to learn about computer hardware, ensuring smooth functionality and user-friendly access to educational materials.

2. LITERATURE REVIEW

2.1   THE RELATIONSHIP BETWEEN EDUCATION AND CURRENT TECHNOLOGY

Education plays a vital role in societal development and technological advancements have significantly influenced learning methods (Kuswinardi et al., 2023). In Malaysia, the evolution of "Pembelajaran dan Pemudahcaraan" (PdPc) has shifted from conventional approaches to e-learning and now mobile learning (m-learning) (Zahari et al., 2021). Mobile applications, designed for small devices like smartphones and tablets, enhance youth engagement in knowledge-based activities. The rise of mobile learning has revolutionized education by fostering both physical and mental engagement in learning (Murat et al., 2020).

2.2   THE IMPACT OF DIGITAL APPLICATION IMPLEMENTATION IN EDUCATION

Digital applications play a vital role in modern education, making learning more accessible and engaging. According to Ismail et al. (2024), digital learning is highly relevant for today's youth. Kimlin et al. (2019) highlight how technology eases learning by enabling online courses, note-taking, project management and assignment submission via mobile devices. Hamdan et al. emphasize that mobile phones attract student interest, while m-learning facilitates knowledge access anywhere. In addition, digital applications enhance teaching by making learning more interactive and reducing student boredom (Salsabila et al., 2022). Overall, digital applications significantly improve the quality of education and learning experiences.

3. METHODOLOGY

The ADDIE model is a widely used instructional design framework that follows five key stages: Analysis, Design, Development, Implementation and Evaluation. It is applied in an iterative cycle, allowing for continuous improvements based on feedback from the evaluation phase. Each stage provides opportunities to refine and enhance the learning process, ensuring effectiveness and addressing identified weaknesses.
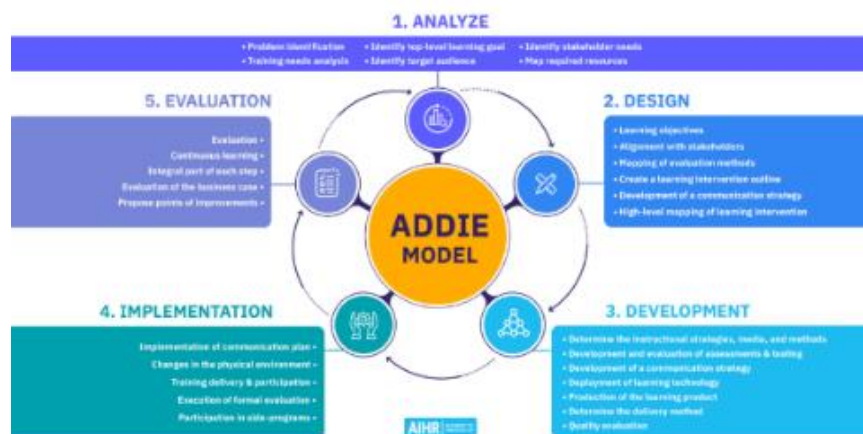

Figure 1: ADDIE Model

3.1   ANALYSIS PHASE

The Analysis phase involved data collection through a survey distributed to students and lecturers to identify problems and determine suitable solutions. Section A gathered demographic information such as age, gender and ethnicity to understand respondent backgrounds. Section B assessed their knowledge of computer technology and system hardware, while Section C focused on evaluating the desired features for the application to be developed, ensuring its design aligns with user needs.

3.2   DESIGN PHASE

This phase involves processes that illustrate relevant information in the development of the application. This includes sketches of the application's functions in diagram form. The purpose of this is to facilitate a clearer understanding of the initial structure of the application being developed.
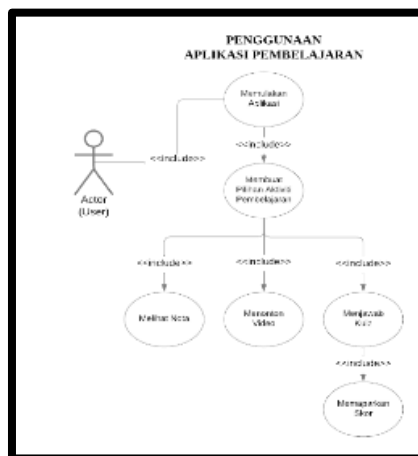
Figure 2: Application Use Case Diagram (UCD)

3.3   DEVELOPMENT PHASE

This phase involves the process of developing the application, starting with the collection of application content such as notes, videos and quiz exercises. In addition, the development process uses software such as Android Studio and Visual Studio Code along with the programmed code that has been created.
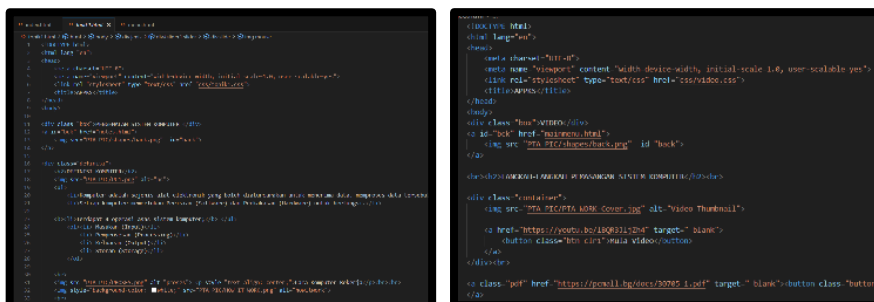

Figure 2: HTML coding for application notes, videos and quizzes

3.4   IMPLEMENTATION & EVALUATION PHASE

The implementation and evaluation phases focus on ensuring the application functions effectively and meets user needs. During implementation, the app is tested in stages and documentation and feedback are collected through Google Forms to guide improvements. Evaluation includes both formative assessments conducted throughout the ADDIE process to maintain effectiveness and summative assessments at the end to measure overall impact. The APK file is distributed for user testing and the success of the application is determined by improvements in user understanding through quiz exercises.

4. RESULTS & DISCUSSION

The Computer System Hardware Learning Application has successfully met its objectives, offering a user-friendly and interactive platform for vocational college students in Malaysia to learn computer hardware effectively. It enhances both theoretical and practical knowledge through modern digital learning tools, making access to information and lesson revision more convenient. To further improve functionality, expanding content to include computer system software, refining quiz design and increasing accessibility via the Play Store and App Store are recommended. These enhancements will improve usability, performance and the overall learning experience.

5. CONCLUSION & RECOMMENDATION

In conclusion, The Computer System Hardware Learning Application has successfully met its objectives, offering a user-friendly and interactive platform for vocational college students in Malaysia to learn computer hardware effectively. It enhances both theoretical and practical knowledge through modern digital learning tools, making access to information and lesson revision more convenient. To further improve functionality, expanding content to include computer system software, refining quiz design and increasing accessibility via the Play Store and App Store are recommended. These enhancements will improve usability, performance and the overall learning experience.

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