THE EFFECTIVENESS OF ANDROID-BASED THEMATIC LEARNING E-MODULES IN INCREASING STUDENT MOTIVATION

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ABSTRACT

The problem that occurs is that students at home more often use mobile phones to open sites such as games, cartoons, and robot videos excessively. This must be watched out for because it will increase anxiety disorders, depression, eye diseases, and decreased brain capture to receive lessons. This research aims to create an android-based thematic learning interactive e-module application in elementary schools (SD) that can help the teaching and learning process of students and teachers. This data was obtained through field research, literature research, and results from questionnaires. This research uses literature methods in data collection and for system development using DevOps methods. This application planning uses JAVA programming languages, and NonSql for its database as well as for testing this system using the Black Box method. The results of this study show that the application of e-modules is interactive thematic learning. After testing the e-module application with several parents and teachers, this application can be said to be worth using because of the 20 Respondents and the number of questions 15 showed the average results of the utility aspect which was 88%, the ease of use aspect 88%, and the user interface quality aspect 87% with very feasible criteria. In addition to parents and teachers, this study was tested by a team of experts with an average result of typographic aspects of 84.5%, visual aspects of 86%, convenience aspects of 79%, content feasibility aspects of 86.5% and learning aspects of 86.5% with very feasible criteria.

Keywords: E-module Interactive Learning, Android, JAVA, NonSql, Black Box.

1. INTRODUCTION

E-module is a development of conventional modules combined with the use of information technology, to make it more interesting and interactive (Mauliana, Shifiyah, Rahmawati, & Nisa, 2022). The e-module is equipped with multimedia facilities such as images, animation, audio, and video (Simarmata et al., 2022). In addition, in e-modules we can also add facilities such as evaluations or tests so that students can better interact with their learning resources. Based on research conducted (Laraphaty, Riswanda, Anggun, Maretha, & Ulfa, 2021), electronic modules are innovative media that can increase student interest in learning. A learning process to be able to improve the achievement of learning outcomes needs to be supported by the right learning guide.

E-module is an electronic version of the module where access and use is done through electronic devices such as computers, laptops, tablets or even smartphones. Text on e-modules can be created using Microsoft Word. But to display interactive media, e-modules must be

created using special e-book programs such as Flipbook Maker, ibooks Author, Caliber, and so on. The advantage of e-modules from printed teaching materials is that e-modules are complete with interactive media such as video, audio, animation and other interactive features that can be played and played back by students when using e-modules. E-modules are considered innovative because they can display teaching materials that are complete, interesting, interactive, and carry out good cognitive functions (Firdaus & Pahlevi, 2022).

E-modules are teaching materials that are considered innovative for learning. As an innovative teaching material, e-modules should be developed by the teacher himself to suit the character of the students and the learning method to be used. One of today's rapidly growing learning tools is computers. The computer system that is currently in our daily grasp is the smartphone. Year 6 System, Number 1 July 2019 Journal of Educational and Learning Technology smartphones are more interesting and easier for students to use, but the resulting e-modules are stored in the form of CDs that can only be accessed on certain computers or laptops (Pakpahan et al., 2020).

Android is an operating system for mobile devices based on Linux and is open or open source so that it allows users to develop their own desired applications and then expand to others (Iskandar, Aman, Miyanti, Hamzah, & Maslihatin, 2022; Purba et al., 2020). From the background of the above problems that can be identified problems that in elementary schools are the need for learning e-modules to help the learning process of students at home so that the results obtained are maximized, another obstacle is that students at home more often use mobile phones to open sites such as games, cartoons, and robot videos excessively (Sulung & Erman, 2022). This must be watched out for because it will increase anxiety disorders, depression, eye diseases, and decreased brain capture to receive lessons (Iskandar, 2022).

The limitation of this study is that the e-module interface was created using Android Studio, using a database from Firebase. Android Studio is the official Integrated Development Environment (IDE) for Android app development, which is based on IntelliJ IDEA. Apart from being a powerful code editor and IntelliJ development tool, Android Studio provides many features that can help code editing, debugging, and testing applications quickly to increase productivity in creating android applications (Fairuzabadi et al., 2023).

2. THEORY

E-Modul

E-module is an innovation from conventional modules. The use of modules in the learning process is carried out because e-modules have the advantage of providing a lot of feedback so that students can know their learning outcomes and completeness thoroughly (Wati & Efi, 2021). E-Module refers to the use of learning modules in electronic versions, to obtain and use them through devices such as smartphones, ipad, laptops or personal computers (Muzaki, Hastuti, Fujiaturrahman, Untu, & others, 2022; Suartama, Setyosari, Sulthoni, & Ulfa, 2019). E-Modules are also called independent learning media packaged in the form of software or applications that are opened through electronic devices. The use of e-modules makes learners more motivated and also improves higher-order thinking skills thereby improving their

learning outcomes (Yerimadesi et al., 2023). E-module is an independent learning device packaged in digital form (Sanova et al., 2022).

Some of the advantages of e-modules compared to printed ones are the presence of audio, video, images, animations, and the presence of quizzes and feedback (Eriyanti, Jumadi, Yanarti, & Rosiningtias, 2023). Furthermore, e-modules are learning materials that are arranged systematically to obtain the expected competencies based on the relevant level of complexity (Ismaniati & Iskhamdhanah, 2023; Susanti, Yennita, & Azhar, 2020). The training E-Module helps train untrained facilitators in evaluating four dimensions namely (1) learning ability, (2) memory, (3) ease of use, and (4) pleasure) (Jawarneh, Alshare, Bsoul, & Kalash, n.d.). The e-modules developed should be accessible via smartphones to make them more attractive and technological developments (Ravista & others, 2021; Syarlisjiswan, Wahyuningsih, & others, 2021). The effectiveness of collaboration-based e-modules on the learning model of questioning, analyzing, synthesizing, and evaluating can increase interest in learning (Hunaidah, Erniwati, & Mahdiannur, 2022; Tyowua, 2023). Android-based interactive e-modules can be, material descriptions, learning videos, and quizzes (Wahyuningsih, 2022).

Metode Pengembangan DevOps

DevOps (development and operations) is a method of developing (Dev) and operating (Ops) software with a collaborative and integrative approach (Sravan et al., 2023). The DevOps method consists of several phases, namely plan, develop, build, test, operate, and monitor (Alnafessah et al., 2021). The software development process is faster and improves the reliability, stability, robustness and security of the environment in which the software is made (Tohirin, Utami, Widianto, & Al Mauludyansah, 2020). DevOps methods can cut the time between development and operation without reducing the quality of the software produced (Erich, Amrit, & Daneva, 2017).

3. METHOD

This study used the literature method in data collection. This planned system development model follows the phase of the DevOps method, which consists of several phases, namely plan, develop, build, test, operate, and monitor so that the e-module is more interactive.

a. Continuous Development, In this phase involved the process of designing and compiling coding in the software. At this stage, development determines what the application is built for. Then, the development looks for ways how this application will be built.
b. Continuous Testing, the software that has been created is tested to ensure whether this application runs as expected. Testing on this application using blackbox testing.
c. Continuous Integration, this stage is at the core of all DevOps cycles. At this stage, the developer makes sure all coding is integrated. Any changes made should be detected as early as possible to avoid bugs in the application.
d. Continuous Deployment, at the Continuous Deployment stage, all coding is put together, after all, coding is put together, and the developer must ensure that all coding can run according to its function. It is also important to ensure that the code is used correctly on all servers.

e. Continuous Monitoring, in the Continuous Monitoring process, monitoring of the running of the application is carried out, by recording all important information about the application. System errors such as failing to load a video, failing to register, and failing to display material.

4. RESULTS AND DISCUSSION

This research data was obtained from the results of filling out a set of questionnaires given by teachers and parents, as well as experts to assess the feasibility results of thematic learning e-module applications. Before respondents fill out the assessment questionnaire given, respondents first test the Android-Based Thematic Learning E-module Application in Elementary Schools that has been made. The data results are shown in Figure 9 for the results of teacher and parent respondents.

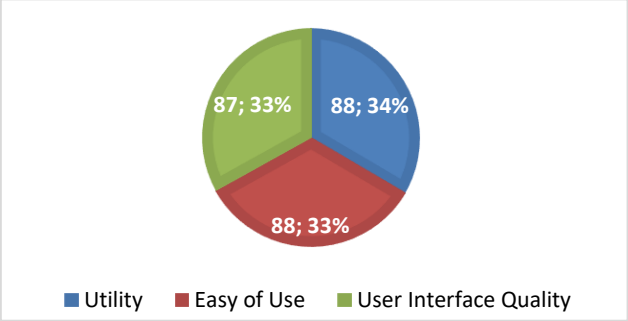

Figure 1. Respondent Percentage Bar Chart

Figure 1 shows that the percentage of feasibility in terms of the Utility aspect of two experts obtained an average value of 88%. Based on the Easy of Use aspect, data is 88% aaverage. The User Interface Quality aspect obtained an average of 87% data. So it can be concluded that intercative learning media in Server Administration subjects are categorized as very feasible to use.

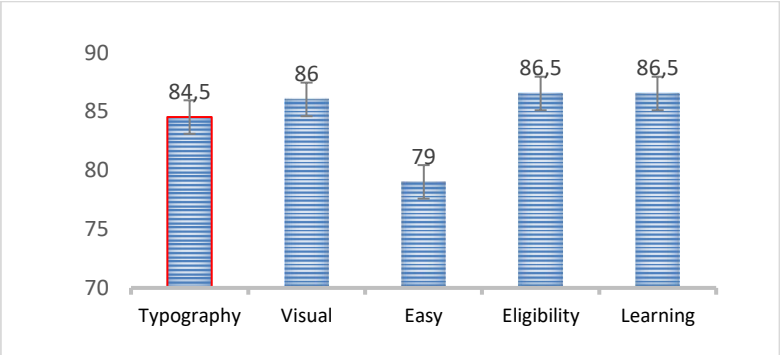

Figure 2. Expert Team Percentage Bar Chart

Figure 2 shows that the percentage of feasibility in terms of Typography from two experts obtained an average score of 84.5%. Based on the Visual aspect, data is 86% averaged. Aspect Easy of obtaining data averages 79%. The Content Eligibility aspect obtained an average data of 86.5%. The Learning aspect obtained an average of 86% data. So it can be concluded that interactive learning media in Server Administration subjects are categorized as very feasible to use. To get the respondent's interpretation value for each question, it is calculated using a formula (Dasilva et al., 2019):

$$x = \frac{\sum x}{n} \times 100\% \quad (1)$$

Description of the formula:
X : Average score
n : number of appraisers
x : total score of each

Then for the formula,

$$\text{Result} = \frac{Total\ score\ obtained}{\text{maximum score}} \times 100\% \quad (2)$$

Eligibility categories based on the following criteria (Arikunto, 2009 can be seen in Table 1.

Table 1. Creteria Feasibility System

No.	Creteria	Percentage
1	Very Unworthy	< 21 %
2	Not worth it	21 – 40 %
3	Pretty Decent	41 – 60 %
4	Proper	61 – 80 %
5	Very Worth it	81 – 100 %

E-module products are very effective in learning. The characteristics of learning that can be carried out from anywhere and anytime, make e-modules a learning medium that is very in accordance with the characteristics of generation Z students. However, one of the weaknesses of generation Z is that they are very easily bored and distracted. Departing from this, e-modules with interesting variations of learning content such as learning videos, quizzes, and articles with various animations are very possible to be combined in e-modules. However, e-modules as an online learning resource must still be followed by a face-to-face learning communication model with students informally to obtain optimal results.

The advantages of the resulting e-module are: 1) increase independent learning motivation, because each topic discussed is equipped with learning videos, as well as evaluations and assignments that are designed and adjusted to the abilities of students; 2) after evaluation, lecturers and students can identify which modules have been successfully mastered by students and which parts of modules have not been successful based on the scores obtained; 3) students achieve results according to their abilities; 4) the subject matter is more evenly distributed and 6) can be accessed practically through smartphones, laptops, tablets and others.

To improve the products that have been developed need to be improved through expert assessment, and product testing, which includes small group trials and field trials. Some suggestions from experts on the resulting e-modules include: (1) The statement of learning outcomes is more tailored to the topic discussed; (2) Practice questions are expanded, so that students can do more practice questions independently. Electronic modules are developed and arranged systematically and by the characteristics of students to facilitate understanding of the material studied. Thus, it will increase student motivation and learning outcomes.

Factors that indicate excellent qualification of the test results: (1) The presentation of module material is clear. An indication of this clarity can be seen in the presentation of material that uses simple language by the level of development of students. (2) technical quality, especially the display aspect is considered attractive; (3) clear presentation of material can make students interested (1) The presentation of module material is clear. An indication of this clarity can be seen in the presentation of material that uses simple language by the level of development of students. (2) technical quality, especially the display aspect is considered attractive; (3) clear presentation of material can make students interested.

5. CONCLUSIONS AND SUGGESTIONS

The e-module application is designed with DevOps methods that have been tested using black boxes by testing the functionality of the application that has been created. After testing the e-module application to subjects consisting of students and teachers So this application can be said to be worth using because of the 20 respondents and the number of questions 15 showed the average results of the utility aspect which is 88%, the easy of use aspect is 88%, and the user interface quality aspect is 87% with very feasible criteria. In addition to testing on students and teachers, this study was tested by a team of experts with an average result of typographic aspects 84.5%, visual aspects 86%, convenience aspects 79%, content feasibility aspects 86.5%, and learning aspects 86.5% with very feasible criteria.

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