



Development of Moodle-Based E-Learning at LKP TIKOM

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Abstract

This research is a research development. It said development research, because in this study concluded a product that is research using the Research and Development method. This research is directed to develop E-learning media based on Website using Moodle platform with additional Video Conference features. This research uses the Waterfall method. This Waterfall method approaches systematically, sequentially in building software. Product trials are carried out in two ways, theoretically and empirically. Theoretically, a trial was conducted on the feasibility test for the use of E-learning with the assessment of media experts and assessors / students, while empirically testing the product using the black box. That the development of website-based E-learning uses the Moodle platform with additional video conference features (1) Attracting course and training participants, and (2) Assisting the Instructor's task in increasing competency at LKP TIKOM.

Keywords: *E-Learning, Website, Moodle, Video Conference*

A. Introduction

Education that will increase the perspective of human resources based on science, insight into thinking that is very broadly conceptualized and directed as well as how to behave and act based on applicable norms and rules, current technological developments, educational institutions have a large enough role even as applied institutions (Siahaan , 2016; Sakinah & Dewi, 2021). In developing technology in order to increase the competitiveness of human resources in the current era of the industrial revolution 4.0 in accordance with the National Education System Law No. 20 of 2003 which states education that develops capabilities and shapes the character and civilization of a dignified nation in order to educate the nation's life, develop children's potential to become human beings who believe and fear God Almighty, have noble character, are healthy, knowledgeable, capable, independent, creative, and become citizens who are entitled and responsible (Wardani, et. al., 2019; Fauzi, 2020).

The development of technology today is already so fast, so learning must also keep up with current technological developments. Technology-based learning has several institutions that apply both formal and non-formal. During the development of the technology, many platforms were developed that could be used to develop distance learning. This platform will create

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technology-based learning that will be applied to students or the general public. One of the technology-based learning development platforms is Moodle.

Modular Object-Oriented Dynamic Learning Environment or an abbreviation of Moodle is a platform used to support online learning management systems and using computer devices (Mongi & Hendry, 2021). So, if you want to create a learning application such as E-learning, then you can use Moodle as the best alternative. Moodle is also included in a web-based application which every learning activity related to material access, discussion, question and answer, to evaluation can be done through the website display using a browser (Nurmaidah & Nurmadina, 2021; Mutoharoh & Ambarwulan, 2021).

The first feature is the dashboard from Moodle which looks intuitive and has been well integrated. In the home menu (main page) there is a lot of important information that includes special lists, calendar of activities, general announcements, to lists of active users who are online. In addition, the appearance of the homepage can also be customized by the user according to the access rights they have. At least, there are three kinds of access rights that can be managed by Moodle, namely access rights as administrator, teacher, and student. Of course, each user has different functionality and roles.

LKP TIKOM plays a role in the development of knowledge, especially in the field of Information Technology Competence. So far, the learning process at LKP TIKOM is still conventional, in other words that the teaching and learning process between students and instructors can only be done by meeting between students and instructors in the classroom. If the meeting between students and instructors does not occur, then indirectly the learning process cannot be carried out. The learning process is fully carried out in the classroom which causes the transfer of knowledge to be hampered by the learning process at LKP TIKOM which results in reduced understanding of a material in the field of competence.

The learning process at LKP TIKOM should provide breadth for students to actively learn according to their understanding. For this reason, a new learning model is needed based on an existing model, one of the technologies that is trending used in education is the use of E-learning. There are many conveniences and advantages that are obtained by using the E-learning system, including activities that are not limited to distance and time, the evaluation process can be carried out in a scheduled and automatic manner, extensive content and easier to find, and more efficient at a relatively low cost. The learning that can be obtained from E-learning is a program designed for the needs of students that can be used in learning activities. Through the features in E-learning such as video conferencing, downloading materials, doing computer test assignments to carrying out competency test tests that can be done online.

B. Method

This research leads efforts to develop E-learning from previous research. Through this research can develop new things that are innovative to find solutions to every problem. One thing that can be done to solve existing problems is by developing Moodle-Based E-learning at LKP TIKOM. The method used is the R&D method or research and development is the process of making or developing a product and validating the product. This method is more towards testing a product than testing a theory (Carlsson, 2011). In the research and development method there are steps of the process that must be carried out. Among the steps that must be taken are collecting the required information and studying the findings of research related to the product to be made (Kupiainen, 2015). After getting the findings, then developing the product based on the information and findings, testing the finished product and revising the product to correct the

shortcomings of the product test results. After repairs are made, the product is re-tested in the hope of perfection of the product made. The final step is product maintenance.

The type of research method used is the Waterfall method in the development of the Moodle platform E-learning system is the Waterfall method. Why researchers use this method is because this method the waterfall method takes a systematic and sequential approach in building and developing systems. According to Brambilla (2017), the waterfall model is a classical model that is systematic, sequential in building and developing software. To analyze the running system, this research uses the Visual Paradigm for Unified Modeling Language (UML) Enterprise Architect program to describe Use Case Diagrams and Activity Diagrams.

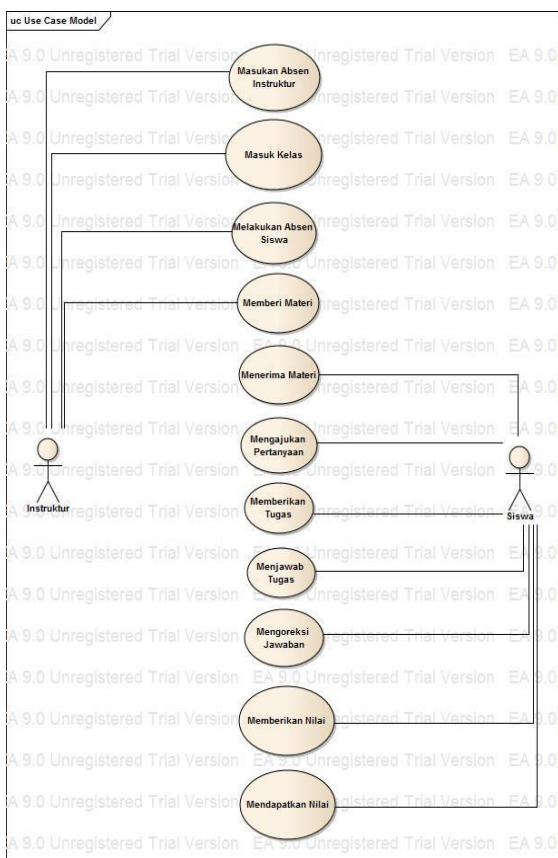


Figure 1. Use Case Diagram of a Running System

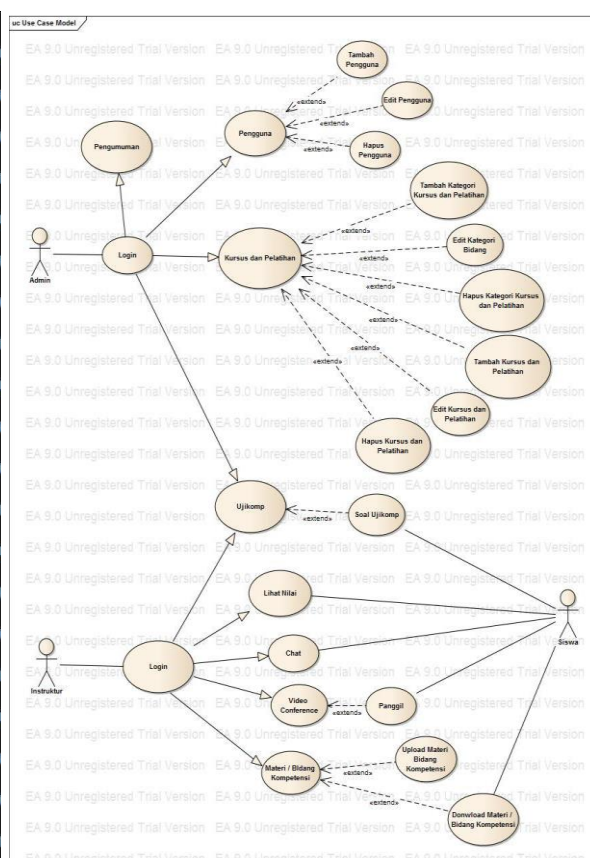


Figure 2. Use Case Diagram of the System Developed

C. Result and Discussion

The implementation and testing stages are carried out after the system development process is complete. Implementation and testing of the TIKOM LKP Moodle E-learning system will be carried out. After implementation, testing of the new system will be carried out for further system development (Sittig, 2015).

Testing the Moodle E-learning system will be carried out using the Black Box testing method. This test is carried out to determine whether the functions of the system work well, the input and output produced are as expected, the integration of external data system testing is running well (Siagian, 2020). Acceptance level testing on users involves the participation of the

session or participants along with the instructor, participants fill out a questionnaire containing the user's views on the Moodle E-learning application at LKP TIKOM.

On the main page of the Moodle E-Learning application, which can be seen in Figure 3, there are several menus that appear, namely the login menu, chat menu, video conference menu, and course menu. The chat menu serves to create a chat forum. While the login menu functions to enter E-learning. The video conference menu functions for face-to-face remote learning with audio visuals supported by slide shows. The course serves to see the subject and the instructor's name in the field of competence.



Figure 3. Main page of E-learning



Figure 4. Login page of E-learning

In the E-learning moodle there is a login page that has the function to enter the E-learning moodle, either logging in as admin, instructor, and assessor/student. In this E-learning the program is made using a multi-user system, in one login menu can be used by three types of users who have different access rights. There is also a guest login and registration login menu. The registration menu has not been activated in the E-learning application because the user is created and uploaded by the admin.

The admin page is a page that functions to perform overall system management. Admin can create instructor accounts and student/assessment accounts, can upload users. Admin can also create course classes, create quizzes/exam questions, and change course page views. The initial view of the admin page can be seen in the image below.

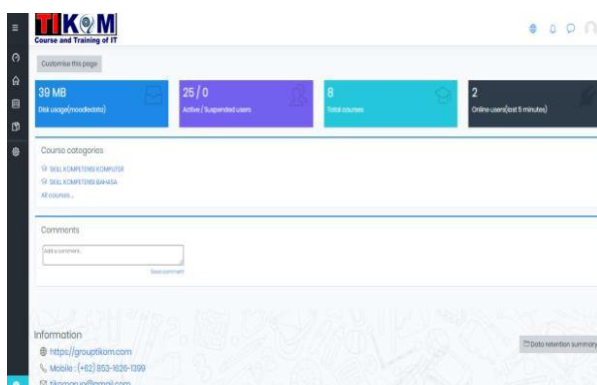


Figure 5. Admin page of E-learning

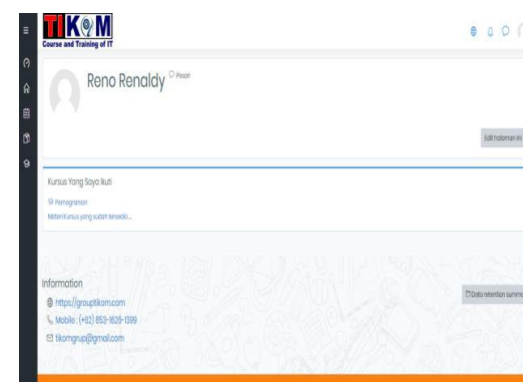


Figure 6. Instructor page of E-learning

The instructor page is a page that is specifically used to process the instructor menu such as chat rooms, materials, exams, grades, and logout. The display on the instructor page can be seen in the figure 6.

The student/assessment page is a page that is specifically used for student/assessment logins to view announcements, enter forums and take exams. On the student page there are several menus such as chat rooms, subjects and logout. This page is used by the assessors/students to view the material that has been uploaded by the instructor. Starting with logging in first in the login menu as an asesi/student, then entering the session/student page, then clicking the course material menu, there will be a list of course fields.

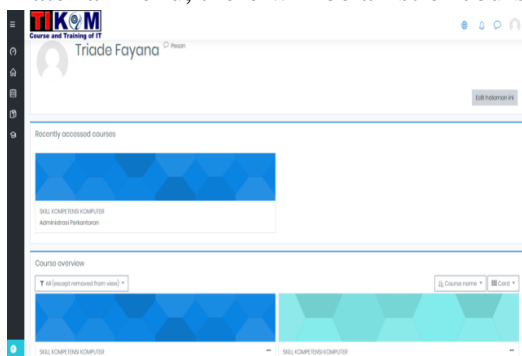


Figure 7. Student/assessment page of E-learning

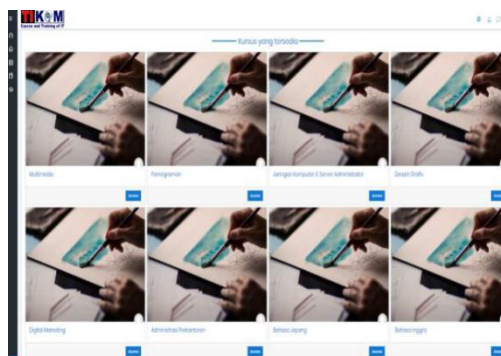


Figure 8. Course page of E-learning

The Course page is used to view classes and areas of competence, on this page there are several classes and courses that have been inputted into Moodle. Here every student is expected to learn the material in the field of competence. On this page, instructors can upload course materials in the areas of competence being taught so that they can be downloaded by students/assessments

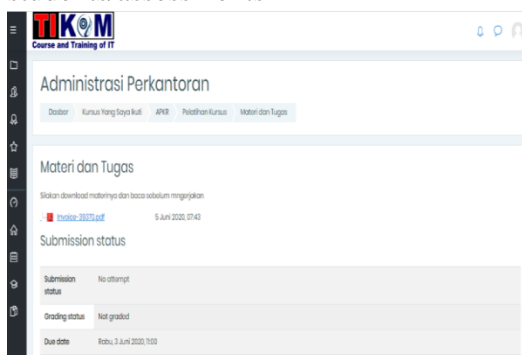


Figure 9. Upload course page of E-learning

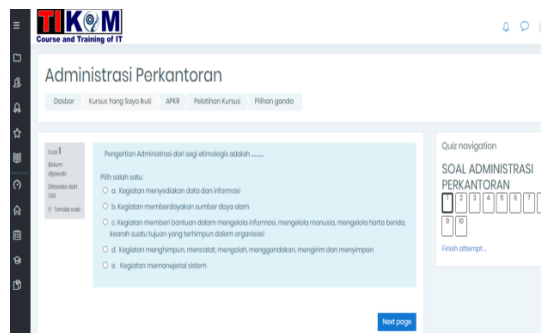


Figure 10. Comp or quiz test page of E-learning

This comp or quiz test page is a page for students to start working on questions carefully, the questions that are loaded will also be displayed randomly and given a time timer that has been determined by the instructor. On this page, you can see the results of this exam directly. After completing the exam questions, the score that will be obtained by the student/assessment will appear. The results of this value will be stored into the database automatically based on the course shown in figure 11.

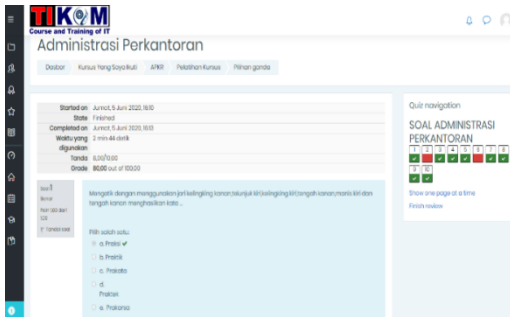


Figure 11. Result course page of E-learning

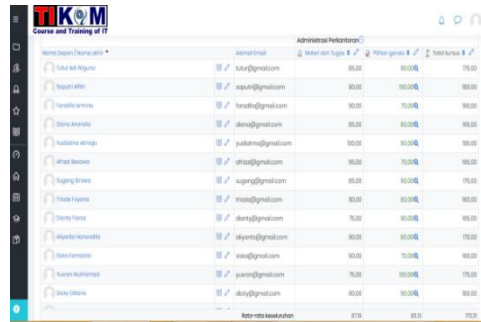


Figure 12. Entire result page of E-learning

On the entire value page, the list of values as a whole can be seen from the admin menu or the instructor menu, then click on the value, it will appear as shown in figure 12. This page displays a chat forum that can be used by instructors and assistants/students to interact through chat forums. The following is a picture of the chat page in Figure 13.

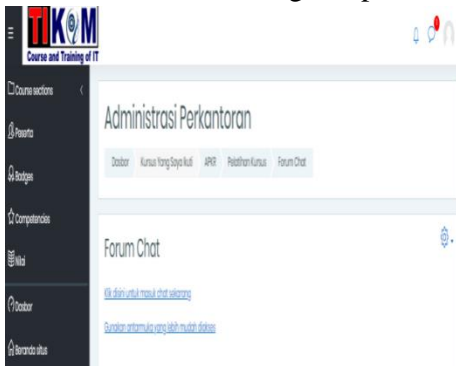


Figure 13. Chat page of E-learning

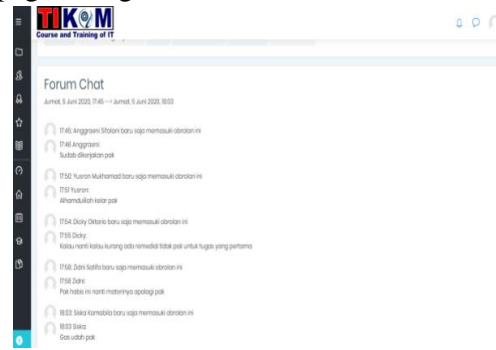


Figure 14. Chat forum page of E-learning

Students can participate in chat forums, can discuss with friends in the same class and instructors. You can ask questions with the instructor if there is course material that you don't understand. The following is a picture of the chat forum page shown in figure 14.

In this menu, instructors and assistants/students can learn, discuss, ask and answer questions supported by audio-visual so that learning is more real, even from a distance. The following is an image of the video conferencing page.



Figure 15. Video conference page of E-learning

Black box testing is carried out by the author on the Moodle E-learning application that has been made. In testing the black box system, it is done by testing the menu section of the E-

learning application whether the results obtained are as desired. Black Box Testing is a way of testing by running or executing the model, then observing whether the results of the module are in accordance with the desired learning process. The system was run using a web browser and experimented with accessing the E-learning application Moodle LKP TIKOM. This test is carried out to find out whether the features contained in the E-learning application are running well according to their functions. This functional testing phase is carried out by accessing or running the features in the E-learning application Moodle LKP TIKOM.

D. Conclusion

Based on the results of development of Moodle-based E-learning at LKP TIKOM, it can be concluded that the research objectives have been achieved by the completion of the Moodle-based E-learning application program at LKP TIKOM with the E-learning portal. In this study, there are still many shortcomings that can be improved in the next research. So, this E-learning application can be better and more perfect, there are several suggestions that can be used for further research including: There is a need for continuous updates for material information when it has been downloaded by the students/assessor in the E-learning; There needs to be an effort to develop Moodle based on Android Studio Mobile; In future development this Moodle-based E-learning application program can be connected with SMS blast notifications on mobile smartphones, where task notifications, quizzes and grades are more easily accepted by asses and students.

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