Development of E-Learning Application using Web-Based Tools to Improve Learning Effectiveness (Case Study: STT Mandala bandung)

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Abstract. E-learning system with an assorted advantage that currently steal attention to various parties, especially the academic circles, has opened new horizons in learning process in the fields of education. And it is an alternative that is suited to be applied within the framework of our understanding of a teaching materials in the mass communication now. Delivery of information, communication, education and training online. This does not mean the e-learning replacing conceptual model of learning in the classroom, but only reinforce the learning model through the development of educational technology. The research done by directly observe so that we get the results of an analysis of the system which needs to be created. A literature study was also conducted to seek other sources that can be the basis and reference in making e-learning applications. E-learning system is made by using the programming language PHP and uses a MySQL database. It can be concluded that the application of e-learning has been designed and implemented with facilities covering downloading materials, assignments, quizzes and upload the material.

1. Introduction

E-Learning (electronic-learning) or learning through electronic means is a modern learning system in the teaching and learning process in schools and universities. E-learning develops in line with the development of Information and Communication Technology (ICT), especially the development of faster and easier and relatively inexpensive internet access. Through e-learning all lecturers' lecture documents can be accessed by students and vice versa. Students can carry out lecture tasks by simply sending files to Lecturers, so that the completion time of lectures becomes very efficient, cost-effective and can streamline the resources available in the education work unit (Faculties and Prodi). Through e-learning students no longer have to be in the classroom to listen to lectures.

E-learning is realized today is very necessary to support the success of the students, therefore at this time a system that can reach students globally is needed to improve the efficiency of distance learning. Through internet facilities Lecturers and Students can communicate easily, on a regular basis or whenever communication is done without being limited by distance, place and time, because this system provides support which is quite significant and provides access to material that can be accessed by students at any time and anywhere when needed without having to be in a particular institution, for example at school or on campus.
On STT Mandalika Bandung campus the e-learning system is available but not perfect. The existing content is not filled because the lecturers and students are not interested in filling it out. Therefore the delivery of material is only limited to meetings at the campus, so it will not develop the abilities and knowledge possessed by students. The time available for teachers and students to face to face in the classroom is very limited. In addition, the process of delivering material is almost completely carried out in the classroom which causes the delivery of material to be late or not even delivered if the meeting does not occur. This can make student development become late.

The purpose of this study is to build an e-learning system to improve the effectiveness of teaching and learning in order to facilitate the delivery of lecture material.

The objectives to be achieved are as follows:

a. The system built can make it easier for lecturers to deliver lecture material periodically.

b. The system built is able to reach students widely and can access material globally.

c. The system built can meet the needs and demands of the campus in improving learning efficiency.

Other paragraphs are indented (BodytextIndented style).

2. Literature

2.1. E-Learning

The term e-learning contains a very broad understanding, so many experts describe the definition of e-learning from various points of view.

"E-Learning is a type of teaching and learning that allows the delivery of teaching materials to students by using Internet, Intranet or other computer network media. (Darin E. Hartley:2001)

" E-learning as any teaching and learning that uses electronic circuits (LAN, WAN, or internet) to convey learning content, interaction, or guidance”. (Jaya Kumar C. Koran :2002)

From the definitions that arise we can conclude that the system or concept of education that utilizes information technology in the teaching and learning process can be referred to as e-learning. The objectives to be achieved are as follows:

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2.2. PHP Hypertext Preprocessor (PHP)

According to Abdul Kadir (2008: 2), PHP stands for PHP Hypertext Preprocessor, which is a script-shaped language that is placed on the server and processed on the server.

According to Muhammad Imansyah (2003: p207), PHP is a scripting language for web programming and functions as data processing on servers.

In HTML pages can be entered PHP code that will be run every time the page is executed. PHP codes will be interpreted on the Web server and produce HTML or other output that will be seen by Web visitors.

PHP was compiled in 1994 and is the result of the hard work of Rasmus Lerdorf. Then it is continued by other developers and has already passed three major rearrangements to provide mature products like the one currently. In January 2001, PHP was used by almost five million regions around the world, and this number continues to grow.

2.3. PHP MyAdmin

According to Bunafit Nugroho (2001: 65), PHP MyAdmin is a web-based open source program created using PHP applications. And on this occasion a database of e-learning education applications will be designed using PHPMyAdmin.
2.4. MySQL

According to Betha Sidik "MySQL database is a SQL data-based management system that is very well known and is open source". MySQL is built, distributed and supported by MySQL AB. MySQL AB is a commercial company funded by the MySQL developer. MySQL can be defined as:

a. MySQL is a database management system. The database is a data storage structure. To add, access, and process data stored in a computer database, a database management system such as MySQL Server is needed.

b. MySQL is a database management system or database (relational database management system). The connected database stores data in separate tables. This will increase the speed and flexibility. The SQL word in MySQL is an abbreviation of the Structured Query Language. SQL is the standard language used to access databases and is defined by ANSI / ISO SQL Standard.

c. MySQL is open source software. Open source means all are allowed to use and modify the model. All can download MySQL software from the internet and use it without paying.

d. Can learn the Source Code and use it as a necessity.

e. MySQL database server has high access speed, is easy to use, and reliable. MySQL was developed to handle large databases quickly and has been used successfully for many years. Connectivity, speed, and security make the MySQL server suitable for accessing databases on the internet.

3. Methodology

This technique is carried out to find out the rationale of the problem under study by collecting data related to the problem. The data collection techniques include:

3.1. Literature Study

Data collection methods are carried out by studying, researching and analyzing various literatures from libraries sourced from books, scientific journals, internet sites and other reading related to research on e-learning application systems.

3.2. Field Study

a. Interview Method

The interview method is a step in scientific research in the form of the use of verbal communication processes to gather information from a source. The interview was conducted to the manager of the STT Mandala Bandung website which was intended to find information about the system that was running, as well as the needs of the users.

b. Observation method

Observation method is a way of observing a research object to understand the needs of the research object so that the application built can meet the needs of the user concerned. This observation makes it easy to record to be complete and systematic so as to produce better and more accurate data. In using the paradigm in design is very important because it will make it easier to work on the system that is made and make the system more effective. Each paradigm consists of activities that are formed from methods, procedures and tools to achieve goals.

The flow from the Web-Engineering Framework model can be seen in the following figure:

![Figure 1. Web-Engineering Framework](Roger S. Pressman, Software Engineering Fifth Edition, page 570)
4. Result and Discussion

4.1. System Analysis

Aiming to understand the system, find out system deficiencies and determine system requirements. Data flow analysis aims to determine the information process flow. Orientation Object Development used is: Use Case Diagram

4.1.1. Use Case Diagram Login

![Figure 2. Use Case Login Diagram]

4.1.2. Use Case Lecturer Area Diagram

![Figure 3. Use Case Lecturer Area Diagram]
4.1.3. Use Case Student Area Diagram

4.2. Design results
To enter the e-learning page users can access by first entering a user name and password. The use of passwords is intended so that the data inside can be avoided from manipulation by irresponsible parties.

4.3 Testing
Tests carried out on the software that have been built are done by black box testing. Where the black box testing method is a testing method that focuses on the functional requirements of the software created. Black box testing allows software engineering to obtain input conditions that are truly tested in all desired circumstances.
Black box testing tries to find errors in categories of functions that are incorrect or missing, interface errors, error accessing external databases, performance errors and initialization.
5. Conclusion

5.1. Conclusion
Starting from the design process to the implementation stage and testing carried out on e-learning applications, the conclusions are as follows:
1. The e-learning application facilitates the delivery of information and material without time and place limits.
2. Existing facilities in e-learning applications facilitate learning activities between students and teachers, so that they can improve the quality of learning.

5.2. Suggestion
1. Evaluation of learning is still data upload and the assessment is done manually, therefore it is necessary to develop a learning evaluation system that can automatically correct and assign grades.
2. The e-learning website facility needs to be added to make it look more attractive.

6. References

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