Development Of Web-Based E-Learning With Pedagogy Concept
(Case Study: AMIK JTC Semarang)

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Abstract— **Until now the development of information and communication technology (ICT) very rapidly, causing the process of transformation and transfer of conventional knowledge began to migrate into the form online or web-based, both in content (content) and the system. E-learning is a form of implementation of applications that combine the teaching methods and information technology (ICT) as a medium of learning in a digital form. The purpose of this study is to develop e-learning with web-based pedagogy concepts with case studies on JTC AMIK Semarang. The concept of web-based pedagogy used in online learning activities include a presenter, Discussion Forums, and Video Conference. The method used is the Addie Model, which is a systematic process to produce effective learning materials to create web-based learning materials. Produced an e-learning system by applying the concept of pedagogy as a means to support and web-based learning. Feedback indicates that students who follow learning activities in JTC AMIK Semarang by utilizing e-learning facilities to respond positively to the system being developed.**

Keywords: ADDIE Model, e-learning, pedagogy.

I. INTRODUCTION

Until now the development of information and communication technology (ICT) very rapidly, causing the process of transformation and transfer of knowledge to move into a web form (online), both in content (content) and the system. E-learning is a form of application that combines the teaching methods and information technology (ICT) as a medium of learning in a digital form and is implemented using electronic media. E-learning system has become a must for any educational institution, as a supporting medium that can be used in the learning process. The use of e-learning ICT can be useful in helping to overcome barriers of distance and time, and can create new and different ways of learning (Danim, 2010). To meet these challenges is essential to integrate aspects of pedagogy and technology (Hasibuan, 2006; Bjorke, et al, 2003; Govindasamy, 2001) so that the learning process can succeed.

Learning system that existed at Semarang AMIK JTC is currently using traditional instructional been running well, but there are some problems in the learning process, such as limited meeting time course, inefficient distribution of subjects, students are difficult to interact with lecturers because lecturers solid activity and the difficulty of students to express opinion because of physical constraints, language and culture.

The problems posed in this study is how to develop e-learning with web-based concept of pedagogy so that it can overcome the problems in the learning process.

The purpose of this study was to produce e-learning system that can be used in online teaching and learning process.

II. TEORY

A. E-learning Concept

According to Som Naidu (2006), e-Learning is defined as the intentional use of information and communications technology networks in the process of learning and teaching. He also explained that there is another term that refers to the same thing which is online learning, virtual learning, distributed learning, and network or web-based learning. For web-based learning is a distance learning system based on information technology and communication with the web interface. Web-based learning can be classified based on the media and the level of interactivity, namely: First text and graphic web-based learning where the teacher simply storing material within the web-learning, and learners can access it easily. Both Interaktive web-based learning, web learning model has a higher interactivity than the first model because it is equipped with learning tools. Third interaktive multimedia web-based learning, web learning model can make the interaction between teachers and learners in real-time via audio and video streaming, web interaktive discussions, and even audio / video desktop conferencing. Web-learning model can include all of the conditions of learning in the classroom face to face.

According to Khan (2005) e-learning consists of several elements that must exist in which between one element with other elements are interrelated and mutually influence each other as a system. some elements are:

1) Organizing Institute (Institutional Issues); is the presence of administrators who deal with academic issues, student issues, administrative issues, which include: planning, budgeting, overall implementation, monitoring and evaluation and others.
2) System Management (Management Issues), the management system related to the management of the learning environment and distribution of information.
3) Learning System (Pedagogical Issues); a system of teaching and learning process that includes course materials, learning objectives to be achieved, the participants, learning strategies (design, methods, media and technology used) to achieve goals, and learning outcomes.
4) Technology Used (Technological Issues); This includes the planning and preparation of infrastructure (internet, LAN, WAN, connections, bandwidth, etc.) required, hardware and software (PC, server, application software, etc.) related required, as well as other supporting peripherals.
5) System Evaluation (Evaluation Issue); This includes the evaluation of learning outcomes and evaluation of the implementation of the eLearning program as a whole.
6) Display of e-Learning (Interface Design Issue); This includes interface design (interface design) which includes the appearance of web pages, navigation, content, ease of use, interactivity, speed and unloading (loading speed), and others.
7) Support Services Learning and Participant Materials (Resources Support Issue); How e-Learning participants get immediate assistance services (fast and precise).
8) Ethical Issues (Ethical Issues); are the rules and policies generally applicable system (such as copyright issues, intellectual property rights, etc.) and special rules that apply (such as evaluation systems, policies, etc.).

Khan, B (2005) reveal e-learning refers to the delivery of learning material to anyone, anywhere, and anytime by using various technologies in a learning environment that is open, flexible, and distributed. Furthermore, open learning and flexible terms to refer to the freedom of learners in terms of time, place, pace, content, learning styles, types of evaluation, collaborative or independent study (Lai, Pratt, & Grant, 2003).

The types of e-learning mode of presentation include: asynchronous, synchronous, and blended. E-learning refers to the type of asynchronous e-learning systems which learning materials are readily available and can be accessed from anywhere and at any time (Rosenberg, 2001). While e-learning refers to the type of synchronous e-learning systems are "live" which requires faculty and students at the same time on the computer even though in a different place (Welsh, Wanberg, Brown, & Simmering, 2003).

Type the e-learning application that combines asynchronous, synchronous, and traditional classroom called "blended learning" (Rovai & Jordan, 2004). The advantages gained through the application of "blended learning" among others is to improve pedagogy, improve access and flexibility, improve cost effectiveness (Graham, Allen, & Ure, 2005).

B.   E-learning Technology

- The technology required in the development of e-Learning system can be divided into three groups, namely computer technology, communications, and technology for application development learning management system (LMS) and content (content) learning. LMS or Learning Content Management System (LCMS) is an application virtualization to automate and learning process electronically. To develop e-Learning, is now available many LMS, whether that be commercial or Open Source. Some of the commercial LMS is the ANGEL Learning, Apex Learning, Blackboard, Desire2Learn, eCollege, IntraLearn, Learn.com, Meridian KSI, NetDimensions_EKP, Open Learning Environment (OLE), Saba Software, SAP Enterprise Learning, and others. Examples of which are Open Source LMS is ATutor, Claroline, Dokeos, dotLRN, eFront, Fle3, Freestyle Learning, Ilias, KEWL.nextgen, LON-CAPA, Moodle, Olat, OpenACS, OpenUSS, Sakai, Spaghetti Learning, and others.

In general, the LMS provides a standard feature for e-Learning, including:
1. Features for learning materials, including a list of subjects and categories, syllabus, course material (text-based or multimedia), as well as library materials.
2. Features for discussion and communication, including discussion forums (mailing lists), instant messenger, announcements, profiles and contact the instructor, as well as File and Directory Sharing.
3. Features for exams and assignments, including exams (exam), task (assignment), and assessment.

For open source LMS efront version 3.69, was chosen because it is easily adapted to the needs of the user, has the ability to run multimedia connected to the internet in order to develop a web-based LMS applications.
For the manufacture of learning materials, necessary development tools (development tools), as a tool to create text, images, animations, audio and video that will optimize aspects of pedagogy. Once the LMS and learning materials are made with a variety of purposes karakateristik representing lecturers and students for teaching and learning, then the next step is how to

implement the teaching-learning process itself optimally.

C. Pedagogy Concept

According Danim, Sudarwan (h47-50, 2010) pedagogy is the way a teacher teaches that refer to learning strategies with pressure points on the style of the teacher in teaching. Learning strategy contains a theory of teaching where teachers try to understand the teaching materials, students identify and determine the way of teaching. Different strategies are used with different combinations for different groups of students and is expected to improve learning outcomes.

Pedagogical aspects that need to be assessed (Herman, et al, 2008) include: methodical, interactivity, cognitive capacity, learning strategies, user controls, questions, and feedback (feedback).

According Govindasamy (2002) provide a foundation of pedagogy as a prerequisite for successful implementation of e-learning has a very clear change in the logistics of delivering e-learning content in e-lektronik.

Three main pedagogy that explains the concept of learning (instructional). See figure 1.
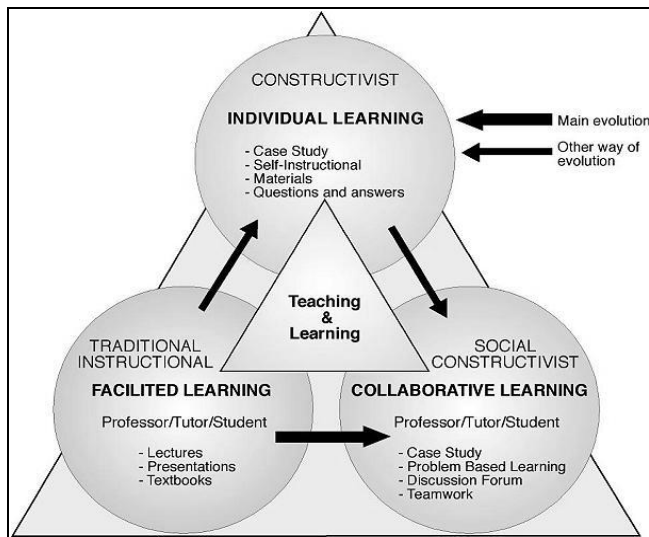

FIGURE 1. THE CONCEPT OF PEDAGOGY (BJORKE, ET AL. 2003)

In terms of learning concepts can be used to teach (teaching) and learning (learning). But now the term of teaching (teaching) as the delivery of course material to students deemed no longer appropriate, so that in the literature of educational technology is only used the term learning. The process of learning (instructional) activities in the form of interaction that can provide a brief overview on the learning objectives have been formulated on the planning of learning through introductory lectures or provide inspiration and personal motivation. In the approach is more in the deepened

understanding construktive to make things that are needed. Like, when learners together create a product and understand the product that finally developed the skills of participants. Participants develop the personality and skills, communication skills, and public relations.

D. Reseach Methods

By using technology and communication can enable the process of learning to collaborate to achieve the goal. So that learning objectives can be achieved it is necessary to design the learning (instructional design) that is using the approach Addie model (Sink, 2008), Addie Model approach is the design of appropriate instruction because it is systematic, and the possible presence of linear iteration when there are design changes. Addie The model consists of five phases, namely Analysis, Design, Development, Implementation, and Evaluation, which represents a dynamic and flexible guideline for building an effective system of learning and performance support tools. The idea of Addie is constantly receiving feedback and continuous learning for building materials. With the model is expected to save time and costs by catching problems while these problems can be improved. See Figure 2.
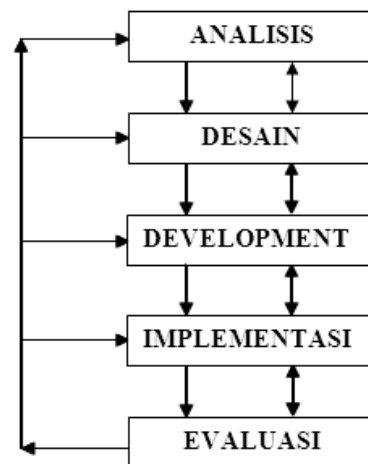

FIGURE 2. ADDIE MODEL (SING, 2008)

Addie's five phases are as follows:
- Analysis of
  During the analysis, designers identify learning problems, goals and objectives, user needs, knowledge, and other relevant characteristics. The analysis also considers the learning environment, every obstacle, media delivery, and time to the project.
- Design

A systematic process of determining the learning objectives. Detailed storyboards and prototypes are often made, and the look and feel, graphic design, user interface and content specified herein.

• Development of

The creation of the actual (production) of the content and learning materials based on the stage of design.

• Implementation

During execution, the plan was put into action and procedures for training of students and teachers developed. Material delivered or distributed to student groups. Once completed, the effectiveness of the training materials were evaluated.

• Evaluation

This phase consists of (1) formative and (2) summative evaluation. Formative evaluation is present in every stage of the process of Addie. Summative evaluation consists of tests designed for criterion-related referenced items and opportunities to provide feedback from users.

E-Learning System Architecture, An overview of e-learning system as a whole in accordance with the component and its functionality can be seen in Figure 3.
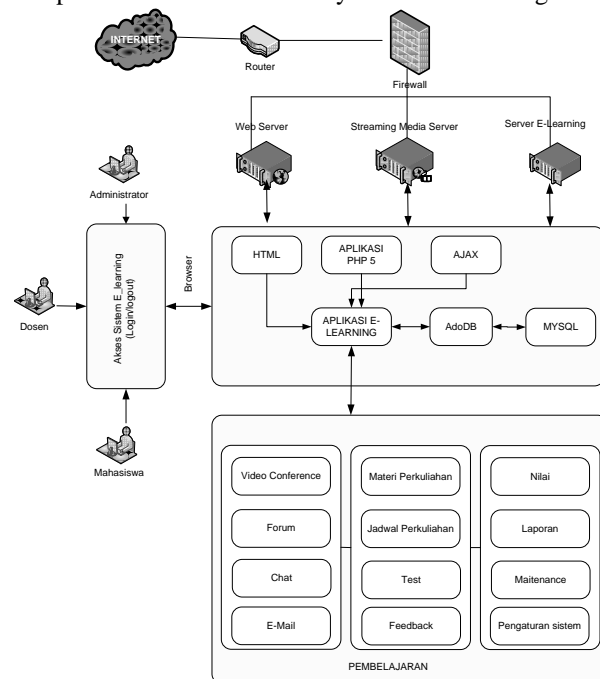

FIGURE 3. E-LEARNING SYSTEM ARCHITECTURE

In e-learning system architecture there are some very important system components such as User, e-learning systems and supporting infrastructure. The third component is what allows the interaction so that the learning system can be successful.

III. RESULTS AND DISCUSSION

as a result of the development of e-learning systems on a case study Semarang AMIK JTC are: the development, implementation and results of the feedback on the concept of web-based e-learning. The system developed in Semarang AMIK JTC using the software and add efront 3.69 (embedded) video conferencing using Bigbluebutton 0.7 +. To be able to access the system, a user must first log in, if you have not registered user to register or contact the admninistrator to get a username and password. If the user successfully logs in it will show the user page according to user type at the time of login. In figure 4 display the login page.
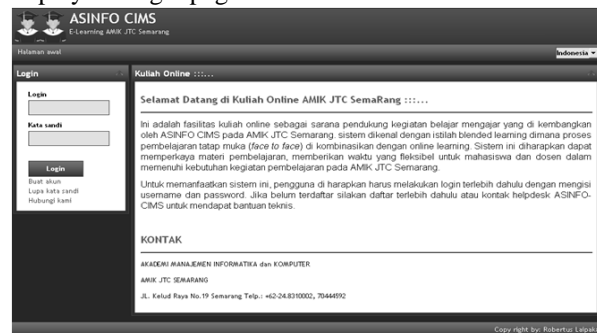

FIGURE 4. PAGE VIEWS LOG IN

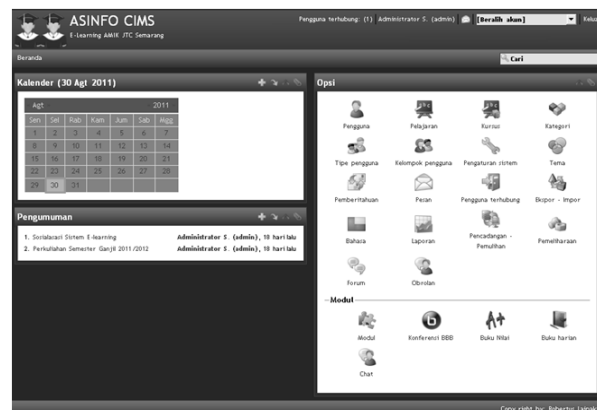In figure 5 is a user who managed to log into e-learning system AMIK JTC Semarang.

FIGURE 5. PAGE VIEWS ADMINISTRATOR

In figure 5 there are several menus including the user menu, navigation lessons, menu categories, menu type user, forum menu, the menu chat, and video conferencing. User menu is used to register the set list of participants, learning to set course menu, menu categories to classify the subject matter, type of menu the user to categorize the type of user, menu board is used discussion forums, and video conferencing is a facility directly online lectures.

Facilities that can be used in learning activities using web conferencing consists of video conferencing, audio

conferencing, Presente Onliner, deskstop sharing and Chat. This facility can be used in realtime or synchron. See figure 6 display video conferencing.

FIGURE 6. DISPLAY VIDEO CONFERENCE

The strategies used in teaching and learning activities with the concept of web-based pedagogy implemented in a way: read online using the online presenter. Process by utilizing an online presenter allows the student must learn the material that has been determined by the lecturer in sequence, if not a student can not proceed to the next material in accordance with a predetermined time. So in this way can ensure students actually learn in a structured way.

Here teachers can monitor the progress of the material being studied by the students by looking at the progress dibar listed. Lecturers can also assess the activity of students in learning the material. See figure 7 display an online presenter.

FIGURE 7. PRESENTER DISPLAY ONLINE

To overcome the interaction between students and lecturers in the activities perkuliah can use video conferencing. The process of learning using video conferencing allows the students can follow the withdrawal perkuliah like meeting face to face where the material is presented by lecturers using a live presenter. Before the participants followed the lectures online, participants / students must receive an invitation from the professor who will conduct classes online through a predetermined schedule. By utilizing video conferencing is expected to overcome the constraints of the interaction between faculty and students due to the density of activities both lecturers and physical limitations, language and culture as well as kendalan location. To use this facility should pay attention to access the Internet and its infrastructure in order to run properly. See figure 8 displays the video conference.

FIGURE 8. DISPLAY OF VIDEO CONFERENCING

To conduct an evaluation of learning activities on a web programming course using e-learning with the concept of a web-based pedagogy test needs to be done. See figure 9 display test to see feedback on the application of the concept of web-based pedagogy using web programming course.
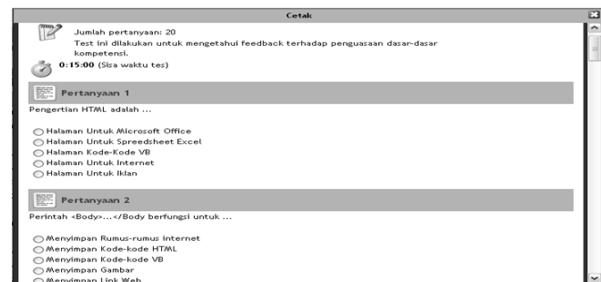

FIGURE 9. DISPLAY PROBLEM TEST

Based on the scores and weight data obtained from the number of subjects n = 16, the item about = 20, where the weights for correct answer = 1 and one with weight =- 1, then obtained the original score of 92.6% of the 16 students who answered correctly to 20 items or 60.2% question score weighting is obtained from each correct answer is worth one (+1) and if the answer wrong will eat at kurangin one (-1). Can be seen in figure 10. Score chart data.
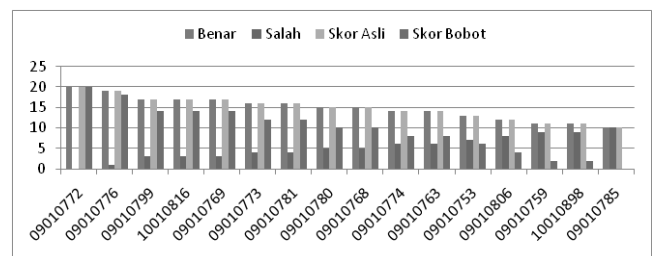

FIGURE 10. GRAPH SCORE DATA

From the results of tests conducted on the 16 students taking a web programming course on mastering the basics of html and php command obtained feedback from learning activities with e-learning using the concept of web-based pedagogy, the original average score of 92.6 students in the can % or 60.2% of the weighted scores obtained from each correct answer is worth 1 (one) and incorrect answers will be in kurangin one (-1) of 20 grains of questions. From the feedback that was obtained on students who follow the activities of learning with e-learning means the learning process with the concept of e-learning with web-based pedagogy in Semarang AMIK JTC can be implemented as an average of 60.2% of students were able to answer questions properly.

IV. CONCLUSION

From the results of research development with the concept of e-learning web-based pedagogy can be summarized as follows:

1. Dihasilkan an e-learning system by applying the concept of pedagogy as a means to support and web-based learning.
2. Sistem developed using the pedagogical aspect of which there is a learning process, including: faculty, course materials, learning objectives to be achieved, the participants, learning strategies, and learning outcomes.
3. Feedback showed that students who follow learning activities in JTC AMIK Semarang by utilizing the facilities of e-learning using web-based pedagogical concepts provide results with an average of 92.6% or 60.2% of the weighted scores are able to answer 20 questions with a good grain.

The results can be used as reference materials and additional knowledge about the development of e-learning, especially in web-based learning process. So that teachers or lecturers can apply this approach in the process of learning and teaching.

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