

# Development of Personal Learning Network System To Build E-Literacy

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## Abstract

A great nation can be seen one of them from the high culture of literacy communities. Indonesian nation still needs many efforts to create a culture of high literacy of the society. The potential is most likely to be initiated immediately is the education community. In this regard, this study is directed to initiate the students with the title "floating Personal Learning Network in Effort To build Eliteracy Students". Long-term goal is to build the literacy culture of Indonesia which triggered the advancement of ICT, especially e-learning technology. Through this research will form a model and e-learning system that can be used by students as a vehicle for learning in order to improve cultural literacy. This system will be able to accommodate the use of the latest tools of personal nuances such as Facebook and Twitter. The system is designed to be easily controlled by the lecturers and students to support learning activities, both within communities and personals. There are adequate facilities for two-way communication between students and college students, students and lecturers, and lecturers and other lecturers. Research method used is a method of Research and Development (R & D) which is adjusted into four steps namely preliminary study, planning, development and implementation, and evaluation. The study begins with the development of field studies to see the latest trends in Internet usage among the students that it becomes a strong reference to the next developmental stage. The results of this study generally showed increased academic atmosphere of atmospheric positive and active in learning.

**Keywords:** *E-literacy; E-learning; Personal Learning Network.*

## 1. Introduction

Generating cultural literacy may be initiated by a variety of ways, one by utilizing Information and Communication Technology (ICT) which called as "eliteracy". In ICT development, Indonesia is in rapid development, one indicator is the data that Internet users in Indonesia continues to increase an average of 25% per year (apjii.com), it is estimated that by 2012 the number of Internet users in Indonesia by about 50 million users. ICTs, especially Internet technology can be the "enabler" process of education which will make its citizens as a knowledgeable society

(knowledge-based society) as a condition of life in global era and future.

From the habits of Internet users in Indonesia, recent data show that most users are users who are very active on social networking sites (social networking) like Facebook and Twitter (alexa.com, 2010). This study utilizing the potential and the tendency was to be accommodated into a model of e-learning with Personal Learning Environments approach from the standpoint of the individual learner, or a Personal Learning Network from the standpoint of the community.

See to the opportunities and the facts above, it is necessary to do scientific studies of the efforts to improve cultural literacy with the use of ICT (e-literacy) to take advantage of e-learning technology based on Personal Learning Network (PLN).

This study related or coordinate at least 3 (three) areas, 1) the development of models of learning, 2) ICT-based education system, and 3) the development of e-learning. The expectation of this study, the learning model that utilizes social media can enhance the learning culture of students. In ICT-based education system is expected to develop systems-based e-learning with social media can enrich the education system. In development of e-learning, this system is expected to provide facilities to related parties in carrying out activities that are self-learning and online.

## 2. E-Learning

Literally, e-learning comes from two words, namely "e" which is "electronic" and "learning". E-learning can be defined as learning that is formed or the use of electronic media. Philosophically, Cisco, 2005, "E-learning :Combines of Commu-nication, Education, Information, and Training" from <http://www.isco.com/warp/public/10/> wwtraining/elearning accessed March 28, 2009 revealed that e-learning has four interpretations, namely:

First, e-learning is the delivery of information, communication, education, and online training. Second, e-learning provides a set of tools that can enrich the value of learning in the conventional (conventional learning models, a review of textbooks, CD-ROMs, and computer-based training), it can answer the challenges of globalization. Third, e-learning is not mean to substitute for the conventional model of learning in the classroom, but strengthen the model of learning through content enrichment and

development of educational technology. Fourth, the capacity of students vary greatly depending on the content and manner of its delivery. The better the alignment between content and delivery of learning style instrument, the better the capacity of students who in turn will give better results.

It can be concluded, e-learning is a term to display the way of learning by using the Internet media, which can complement conventional learning in accordance with the conditions and needs.

E-learning as an alternative conventional learning, has some different characteristics from conventional learning. According Soekartawi (2003:18), e-learning has the following characteristics.

- 1) Utilizing the services of electronic technology Lecturers and students, students and students, or lecturers and lecturers can communicate relatively easy without being limited by protocol,
- 2) Utilizing the advantages of computer (digital media and computer networks) Using instructional materials independently (self-learning materials) are stored in the computer and can be accessed by lecturer and students anytime and anywhere when the need is concerned,
- 3) Using the schedule

Students, curriculum, learning progress, and the matters related to educational administration can be viewed at any time on the computer, and

Accelerate the academic communication With this system can be accelerated PLN good communication lecturers, professors, students, and students.

### 3. Content And Actor E-Learning

E-learning content is an object that must exist in the e-learning, so that learning can be run. E-learning actors are individuals who implement e-learning. Wahono R. (2005: 9), explains that e-learning content can be as text-based content (like text-based content on a regular textbooks), multimedia-based content (content passive or interactive multimedia) or a combination of both (text-based content and multimedia-based content). Actors in implementing e-learning can be said same as the actor in the conventional learning, the learning required of teachers or tutors who guide, students who receive teaching materials and teaching as well as administrators who manage the administration and teaching and learning process.

Content and actors have a very close relationship, because e-learning content is created, stored, treated and used by the actor e-learning. Casey, J.W. (2006:73), reveals that there is life cycle in the content of e-learning and actor is the center of the life cycle. The actor plays a role in create, archive, maintain and use e-learning content.

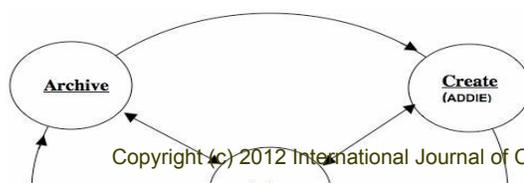


Figure 1 : E-learning Content Lifecycle

According Wahono R. (2005:3), e-learning methods can be divided into two types, follows:

#### 1) Synchronous System

Applications that run in real time where all users can communicate at the same time, for example: chatting, and video conferencing.

#### 2) Asynchronous System

Applications that do not depend on the time in which all users can access the system and perform the communication between them adjusted to the time each, for example: web forums, and email.

### 4. Personal Learning Network (PLN) System

Implementation of e-learning technology in the last decade, focused to the administrative needs of learning, such uploading needs of teaching materials, student value management and implementation of online evaluations, so to make it happen many parties develop a Learning Management System (LMS). LMS application is to apply the concept of e-learning approach with an approach called Virtual Learning Environment (VLE). VLE approach has characteristics as follows:

#### 1) As a Large System

VLE approach should make the system as a system of great information and require greater resources. The system required by this approach has many features in it (learning resource features, feature evaluation, feature discussion, etc.).

#### 2) Emphasis to The Needs of Institutional

VLE approaches concentrate to facilitate monitoring the implementation of educational institutions of learning in the classroom but less attention to the student learning experience itself.

#### 3) Tends Closed

VLE systems approach tends intended for one educational institution only, closed from the outside of institution. Implementation of e-learning with the VLE approach leaves a lot of problems, including learning activities are not to engage in independent learning through e-learning is through.

In *e-learning* development, was born another approach to answering the weakness of e-learning system with LMS applications, including the Personal Learning Environments (PLEs) and Personal Learning Network (PLN) approach.

According Tsauri (2009:26), Judging from the theories of education, e-learning with PLEs approach is closely related to educational paradigm constructivism, collaborative learning and portfolio assessment, because in the implementation e-learning system is promoting the activity of individual learners to perform independent learning activities. PLN is different with the current approach VLE. Application of PLN focused e-learning as a center for online learning activities undertaken by individual learners in a network, not seen from the organizers of the learning needs of institutions.

Tools of e-learning with PLN approaches tend to be simple and accommodate the trend of using web-based applications. However, PLN-based e-learning requires that learners have the ability to collaborate between these tools, and able to communicate their knowledge into a networking or learning communities that follow.

The position of students in personal learning is central. Learners is central to the teaching service. Students have the discretion either (i) the flexibility to learn on their own abilities, (ii) the freedom to use the time to learn, in this case the student is responsible for all activities that do, (iii) flexibility in controlling the activity, speed, and intensity of learning, in order to achieve learning objectives that have been assigned, (iv) self-assessment of student learning outcomes, (v) students can know their own abilities and learning outcomes, and (vi) students have the opportunity to develop their own learning program. The six types of student status resulted in a difference in teaching and learning responsibility.

On personalized learning, student responsibility for learning itself is very large. Learners are fully responsible for their own learning. The following question arises: are the student have a sense of responsibility for their learning? It is associated with the development of student self-emancipation. Nevertheless since the age of primary education, students are educated to have a sense of responsibility in their own learning.

Position of Personal Learning Network as complement. The help of this system with respect to the learning component as follows (i) planning the learning activities, (ii) organizing the learning activities, (iii) create an open approach between

lecture and students, and (iv) facilities to easy in learning.

Personalized learning program is an effort to complement of teaching classical weaknesses. From the needs of learners, personal learning programs more effective, because students learn according to their own programs. From the system, which is related to the number of learners, seem less efficient. Number of students by about forty people asked great attention lecturer, and it will be tiring lecturers. From the age learners, the personal learning program suitable for students. This is caused by (i) generally students are able to think logically, (ii) students easily understand the instructions or orders properly, and (iii) students can work independently and work well together. Personalized learning programs can be implemented effectively, when considering the following, (i) according with the needs and abilities of students, (ii) the purpose of learning is created and understood by students, (iii) the procedures and workings understood by students, (iv) the criteria understood by students, and (v) the student understood to involvement of lecture in the evaluation. Personal learning programs oriented to providing assistance to each student so that they can study independently. Independence of learning is progress individual demands.

The shift of culture and civilization of the current public education requires us to follow where the current direction of globalization flows. In this modern and advanced era, the role of technology is becoming increasingly felt in supporting the profession of a lecture. Adequate knowledge of technology is absolutely known by the man of today. From experience to date, there are still many dark steps in the mastery of technology. To be literacy, people should learn and should be provided facilities. There are many reasons that people submitted related to the literacy begin from of expensive equipment, do not have the time, lack of facilities, and many other reasons. Having an awareness for literacy, provision of facilities to be very important. Personal learning network system is a device that is expected to encourage the creation literacy among students specially and campus community at large.

## 5. Research Methodology

This study to find a model and e-learning system that can improve student literacy. Researchers trying to develop a system of e-learning refers to the formulation of the results of literature studies and field studies continue to be evaluated to find a prototype that is expected, so that implementation can be done well.

The research method used is a model of educational research methods called Research and Development (R & D). The steps include research developed four

main steps, to adjust the conditions that occurred during the study. The four main steps are composed of sub-steps: 1) Introduction: exploratory studies, and literature; 2) the preparation of hypothetical system model: verification and validation by experts and practitioners, and the revision of the model system, 3) test system, and 4) analysis and revisions: the recommended service.

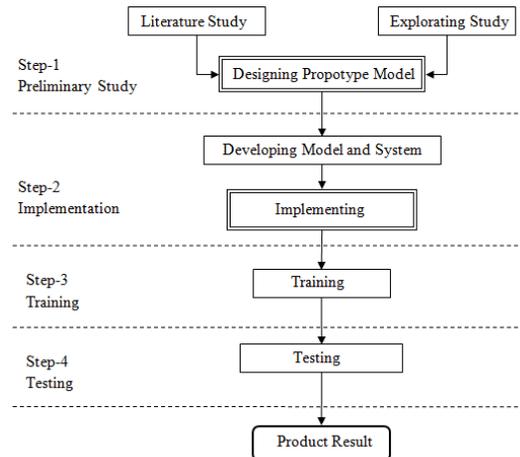


Figure 2 : Scheme of Research

Models and systems Personal Learning Network developed refers to the ability of the model specification. Based on 2 (two) indicators, the resulting system model as follows:

1) The Ability of Model

- a. Can give students self-learning space that is wide enough to use the latest ICT products,
- b. Can encourage students to interact and form a learning community so as to accelerate the implementation of learning,
- c. Lecturers are able to do controlling the activities of student learning, both individually and community,
- d. Lecturers and students can conduct a collaborative activity that can enrich the information and insight lecturers and students,
- e. Can significantly enhance student activities conducted within the framework of the creation of cultural literacy.

2) Specification of e-learning System

- a. The system can accommodate the current use of various tools that have been commonly used by lecture and students, like Facebook and Twitter,
- b. The system is easy to be controlled by lecture and students to support learning activities, both within communities and individuals,

- c. There are adequate facilities for two-way communication between students and students, students and lecturers and lecturers and other lecturers,
- d. E-learning system can be updated in real time,
- e. These features are developed will highlight the ability to stimulate the culture of literacy of students, such as the ability to read, bookmark, analyzing information and writing,
- f. E-learning systems built by various open source application packages that can be developed without requiring a return to the great cost.

The research was conducted in 2010 and tested on Computer Science Education Study Program, Indonesia University of Education.

3) System Model

PLN modeling systems that are used includes two modeling, one the modeling process, and ather data modeling. Modeling process used is a data flow diagram (DFD) by Pressman nomenclature, and data modeling using Entity Relationship Diagram (ERD).

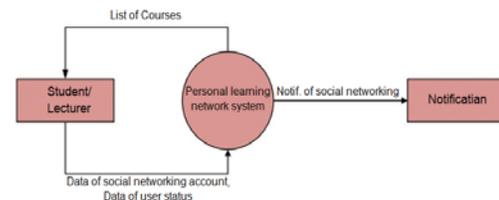


Figure 3 : Contexts Diagram of PLN System

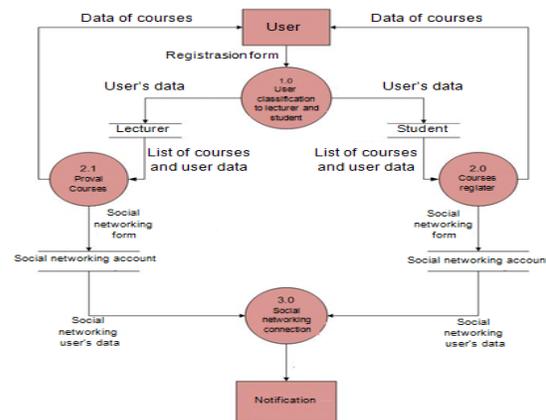


Figure 4 : DFD level 1 Process 0

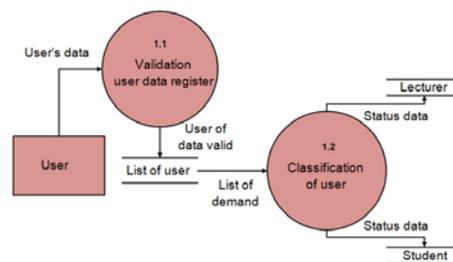


Figure 5 : DFD level 2 Process 1

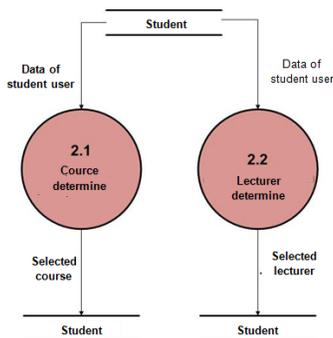


Figure 6 : DFD level 2 Process 2

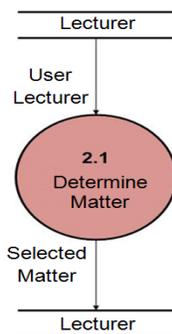


Figure 7 : DFD level 2 Process 3

Figure 8 : Entity Relationship Diagram (ERD)

All activities associated with the material will be automatically documented in this application. Each user in this application will be able to studied like social networking.

Personal Learning Network is a learning system that utilizes information and communication technology (ICT) systematically by integrating all the components of learning, including learning interactions across space and time, with guaranteed quality.

System components include the hardware, infrastructure/networking, software, matter/content, interaction strategies, and actors (lecturers, students and others). The scenarios allow students may contact students directly with students, students with lecture, lecture with lecture, and a variety of materials and learning resources in electronic form. The material referred to in the form of teaching materials, material assignment, exam / test and form linkages.

The main difference between conventional learning and e-learning is the medium of web-based interface that is used during the learning process. In conventional learning interaction takes the form of face to face, whereas in e-learning can be done through electronic media. To illustrate these differences can be seen in the following diagram.

## 6. Results And Discussion

According to the plan, this step has produced a model Personal Learning Network with the steps as below.

Scope of application activity directed at students in finding and getting information by utilizing Information and Communication Technology (ICT) or often referred to as eliteracy.

The target implementation of this application is the lecturer who will deal directly with students as the main object. Lecturers will provide updated material facilitated in recent lectures and students will be more easy and convenient to get it. This application will also help lecture to observe student activities in the eliteracy. To make this application more dynamic then, lecturers and students can further explore the matter with the activity of commenting, posting and getting information from several social media is utilized by this application.

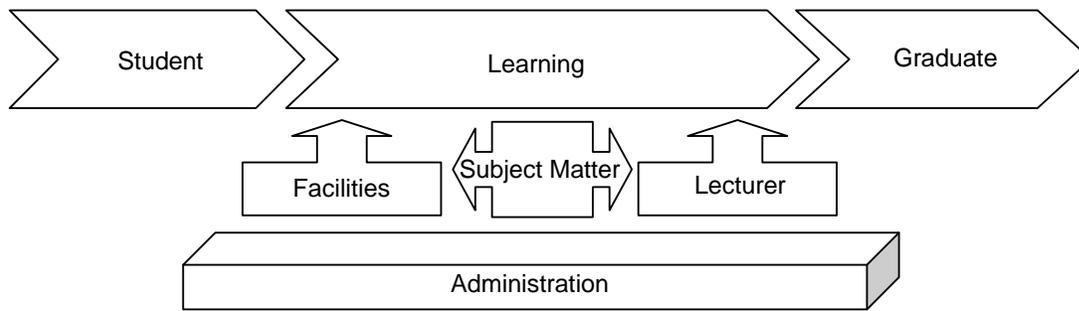


Figure 9 : Scheme of Conventional Learning

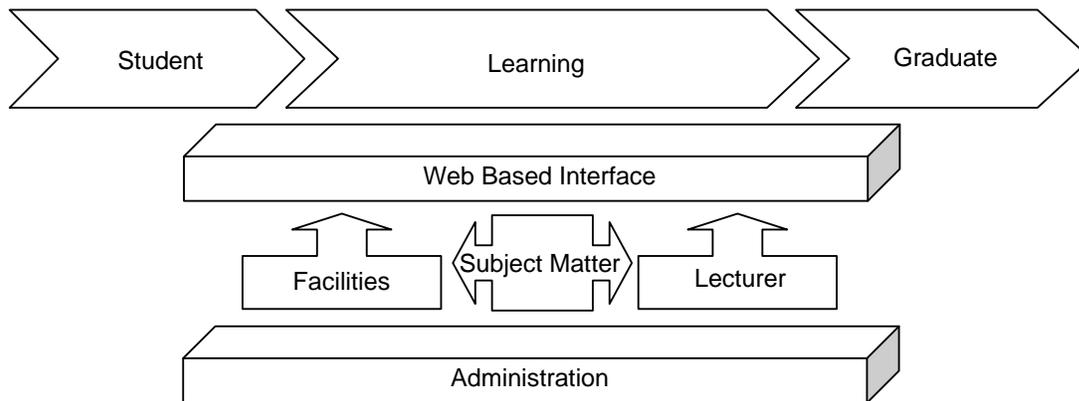


Figure 10 : Scheme of Impelentation of PLN

Personal Learning Network system is built with PHP and MySQL database, the following display system.



Main Menu of PLN System



Login Register to PLN System

Figure 11 : Screenshoot of PLN System

## 2) Number of Lecturers

All lecturers has Amnestied courses through e-learning are available. Generally lecture open a document that has been uploaded to the next teaching session. As an example for the second meeting in

class on personal learning system has been available (open) until the meeting of the third. The tasks given lectures largely through personal learning system facilities and a small part are given directly in the classroom. Here are the activities of lecturers with personal learning system.

**Table 1 :** Lecturer Activities

No	Activities	Explanation
1	Opening the course	All lecture has opened a course (for this study should one course per lecture).
2	Given tasks/quizzes	Assignment / quiz Lecturers can give the task with more frequency, each material / assignment meeting.
3	Checking the assignment / quiz	At first the lecturers a bit overwhelmed to check student work, but can access any time anywhere, with an easy task model examined, general inspection tasks can be completed.
4	Open and respond forum	Any forum enter a personal learning system lecture become accustomed to open and respond to the forum.
5	The forum initiated	Lecture become familiar with the forum to initiate throw a simple matter of logic that requires a response from the community.
6	Uupdate material	The lecturers becoming triggered to update and add material enrichment.

**3) Students Activities**

Students can learn and to download the materials until a future meeting. The All new students opened individually personalized learning system that is

provided. However, students still make a hard copy lecture materials are available. The following student activities data are the average for all students both old and new students.

**Table 2 :** Students Activities

No	Activities	Frequence		Explanation
		VLE	PLN	
1	Opens course	70%	100%	All students access the course taken.
2	Opening the task	90%	90%	There are still approximately 10% of students who do the work of his friend.
3	Sending the task	90%	95%	There are still approximately 5% of students who kesulitasn send a task.
4	Opening the forum	30%	70%	Approximately 30% of students did not use the forum.
5	Opening the materials	80%	80%	There are still approximately 20% of students get the material from his lectures.
6	Responding to the forum	30%	65%	Approximately 35% of students who are not interested in the forum.
7	Initiating forums	25%	65%	Approximately 35% of students who are not interested in the forum.
8	Answering the quiz / test	90%	90%	There are still approximately 10% of students who follow kesulitasn quizzes / exams online.
9	Downloading materials	85%	85%	Approximately 15% of students who do not take material from PLN system.
10	Having a hard copy lecture materials	90%	100%	All students have learning material in the form of physical (hard copy).

**4) Students Feedback**

In general, students feel that the personal learning system help them because most have Internet connection capabilities and facilities. With hotspots provided FPMIPA UPI particular environment and other units, then the student can at any time enter the existing system of personal learning.

**7. Conclusions**

Model of personal learning system generally support student learning communities. The advantages of the model system developed personal learning are:

- a. Does not require the hight development costs because it uses open source software,

- b. In the implementation, users continue to use the applications that likes a aplikasiaplikasi social networking,
- c. Encourage independent learning activities focused for its users,
- d. Allows for knowledge sharing between users,
- e. Encouraging communities to become more productive in implementing community learning, and
- f. Allows implementation of portfolio assessment online.

Disadvantages elearning system model developed are:

- a. Require a long time to familiarize members implement the model,
- b. Requires awareness to keep the model still runs well,
- c. Users who require high commitment to implement the model, especially in self-learning focus, and
- d. In the system developed not cover the management of value.

The model allows the system to be developed further with the higher. The complexity of the system model will never be useful if it is not implemented consistently by all parties included in the diagram of the system model. Operation of Personal Learning Network is one form of learning models based on the development and needs of the academic society in the modern era telekomunikatif. The involvement of managers at the university level and faculty level, as well as faculty and students holding a very important role to achieve success. However, the code of ethics and rules of law relating to the implementation of Personal Learning Network, which involve external parties in the form of cooperation as it should be anticipated. To that end, the Personal Learning Network quality standards and mechanisms for the implementation of quality assurance of e-learning needs immediate attention to achieve the success that make up the student in accordance with objective competence.

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