# ANALYSIS OF IMPLEMENTATION BLENDED LEARNING MODEL (COMBINATION CLASS ROOM LEARNING AND E-LEARNING) IN ELECTROMAGNETIC FIELDS COURSE

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## Abstract

The ultimate goal of Electromagnetic Fieds Course is to empower the students to know, understand, apply, analyze, synthesize , evaluate and create the basic concept of Electromagnetic and it's application in the real wordl. These higher order thinking activities require powerful pedagogical strategy, media and learning technology that could be supported by information technology such as e-learning.

Blended learning model is a combination between two or above learning process or learning media or learning strategies. This paper will be discused about combination of conventional class room learning and e-learning systems. E-learning is a new paradigm in learning process, learning method and learning technology to support and empower students's activity.

This paper will be review and analyze the effect of implementation blended learning model through combine and collaborate class room learning and e-learning in Electromagnetic Fields Course. Analyze were done by quantitative method based on experience in Electromagnetic Fields Course in 2008 – 2009.

Keywords: blended learning, class room learning, e-learning, electromagnetic fields

## A. Introduction

Electromagnetic Fields is one of the subjects that have characteristics is quite difficult to learn, because it is abstract and contains elements of mathematics, specific vector coordinates in three-dimensional cartesius, tube and ball and equality differensial related to the wave nature. The characteristic of the subject and the conventional learning process caused the result of study of students still less. The average score below the B score, so the student must repeat this subject in the next semester. Learning process is still for a clarification on the concept of the abstract through lectures and illustrated through pictures on the blackboard and the viewer. Some times the process of learning in the classroom can not be forced to remember the limitations of time.

These problems must be solved with creative and innovative method in learning process. Using blended learning model (combination class room learning and e-learning) that have closed correlation with information and communication technology was expected can increase student motivation to teach the subject that will be impact on the expected increase in the study.

## 1.  Blended Learning

Blended learning is a blending of different learning methods, techniques and resources and applying them in an interactively meaningful learning environment (Graham, 2005). Learners should have easy access to different learning resources in order to apply the knowledge and skills they learn under the supervision and support of the teacher inside and outside the classroom. This approach will combine face-to-face instruction with computer-mediated instruction. It also applies science or IT activities with the assistance of innovative educational technologies using computer, cellular or I-phones, Sky TV channels and other electronic media. Learners and teachers work together to improve the quality of learning and teaching, the ultimate aim of blended learning being to provide realistic practical opportunities for learners and teachers to make learning independent, useful, sustainable and ever growing.

Blended learning gives learners and teachers an environment to learn and teach more effectively. Learners can select the best activities to suit their own pace, learning style and level, as well as time and place. Learners can be more independent and self-reliant in their own learning. They can also be more able to take decisions, think creatively and critically, investigate and explore as well as solve problems they face in learning and real life. Meanwhile, teachers can be facilitators, supervisors, assessors, organizers and managers of learning activities, and so should be creative and able to support learners and provide various learning materials in different formats.

Blended learning increases the options for greater quality and quantity of human interaction in a learning environment. Blended learning offers learners the opportunity "to be both together and apart." (Garrison, 2004). A community of learners can interact at any time and anywhere because of the benefits that computer-mediated educational tools provide. Blended learning provides a 'good' mix of technologies and interactions, resulting in a socially supported, constructive, learning experience; this is especially significant given the profound affect that it could have on distance learning.

## 2. E-Learning

There are many definitions about e-learning, but in this article e-learning define as the delivery of a learning, training or education program by electronic means. E-learning involves the use of a computer or electronic device (e.g. a mobile phone) in some way to provide training, educational or learning material. (Stockley, D, 2006). E-learning can involve a greater variety of equipment than online training or education, for as the name implies, "online" involves using the Internet or an Intranet. CD-ROM and DVD can be used to provide learning materials.

Electronic learning (or e-learning or elearning) is a type of Technology supported education/learning (TSL) where the medium of instruction is through computer technology, particularly involving digital technologies (Wikipedia). E-learning has been defined as "pedagogy empowered by digital technology". In some instances, no face to face interaction takes place. E-learning is used interchangeably in a wide variety of contexts. In companies, it refers to the strategies that use the company network to deliver training courses to employees. In the United States, it is defined as a planned teaching/learning experience that uses a wide spectrum of technologies, mainly Internet or computer-based, to reach learners. Lately in most Universities, e-learning is used to define a specific mode to attend a course or programmes of study where the students rarely, if ever, attend face-to-face for on-campus access to educational facilities, because they study online.

Distance education provided the base for e-learning's development. E-learning can be "on demand" (Int, 1996). It overcomes timing, attendance and travel difficulties. An e-journey is one type of e-learning or online training. Blended learning is e-learning combined with other training methods, like conventional or another method in learning process (Farhad, 2001).

The implementation of e-learning now were very wide, but they based on a principle that e-learning as an effort in distributing learning material through electronic media. Students and teachers can access it any time, any where and any one. The characteristics of e-learning is a flexible and adaptable learning in distance learning and the distribution of learning material (Surjono, 2007).

## B. Method

Measuring the influence of blended learning model in Electromagnetic fields course conducted with

- Observation in the class room learning.

- Analyze the report of student activities in e-learning

- Testing

- quisionairy to students.

Instruments that used to measure the influence of e-learning on student motivation by quisionairy with likert scale. For the purposes of quantitative analysis, the respective answers are given scores as follows:

| Criteria | Score |
|----------|-------|
| • Very god | 4 |
| • God | 3 |
| • Enough | 2 |
| • Bad | 1 |
| • Very Bad | 0 |

## C. Result and Discussion

## 1. Observation in Class Room Learning

Observation were done in classroom learning process and on the e-learning system. Observations based on the indicators in the student class attendance, student's activity, discussion, responding and give questions. Based on observation to the learning process, there was influence the existence of a significant between the implementation of blended learning model of student motivation to learn. This is indicated by the level of attendance in class for students 80%. In addition, students also increased activity not only the level of attendance, but it was increasing the interaction between the students and the lecturers and students. Held after learning through e-learning students tend to be more active in asking, responding to the problems in the investigation, answer questions from friends, discuss about topics related to the lecture.

## 2. Student's Activity Report By E-learning

On of the advantage of using Moodle Learning Management Systems is the system will create a report that shown the student's activity in e-learning. Based on reports provided by the LMS e-learning, student activity indicates that the difference is quite striking when compared with learning in the class room. Students can access e-earning very long time. Student activities such as downloading learning material, reading material in the form of SCORM (Shareable Content Object Reference Model), discussion, asking, answer questions in a quiz form, enrich the lecture material and train to solve some problems.
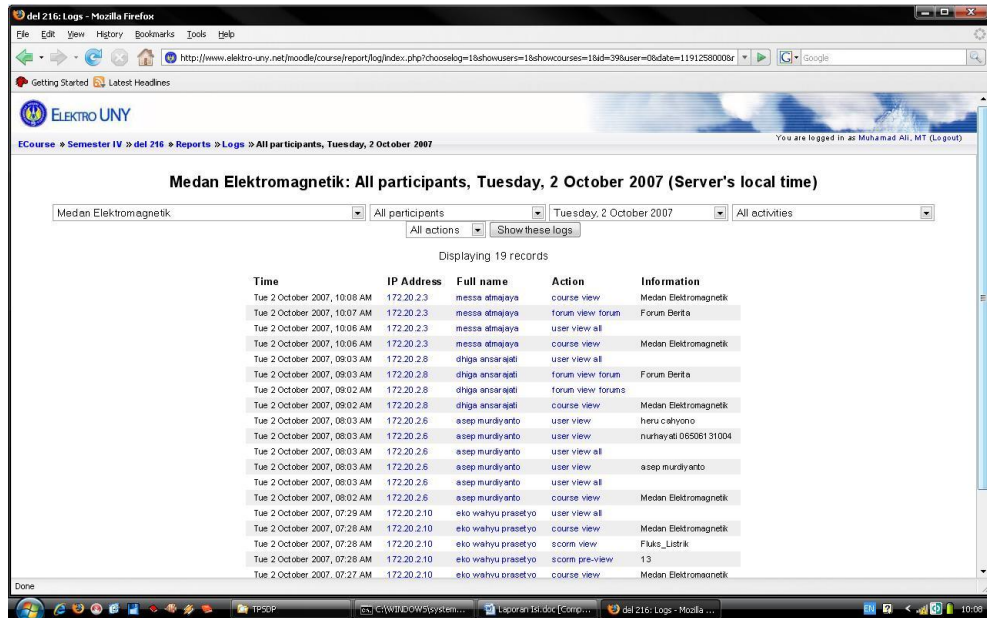
Figure 2. Student's activity report by E-Learning

## 3. Quisoner Result

Measurement is done through quisionairy that was spread to students who use e-learning. Measurements carried out on 3 aspects, 1) the usefulness of e-learning for students, 2) student's interaction with other students and lecturer, 3) motivation in learning. The results from the quisionairy can be seen in table 1.

Table 1. The result of students' quisionairy

| No | Aspek | Number of Question | Average Score | Percentage |
|----|-------|--------------------|--------------|-----------|
| 1 | Usefulness | 5 | 3,47 | 86, 7 % |
| 2 | Interaction | 6 | 3,83 | 96, 0 % |
| 3 | Motivation | 8 | 3,34 | 83, 4 % |

## 4. The Result of Study

E-learning give effect to the results of student (Ali, 2007). From results of test indicate that before using e-learning the average score of students (measured through pre test) is 58, 6, and after using e-learning test results obtained with an average of 73.4. There is increasing score test after using e-learning.

## 5. Discussion

Based on the results by direct observation, student activity report by e-learning, quisionary and the result of test, implementation of learning in Electromagnetc Field course can be realized in the e-learning Education Department of Electrical Engineering (Elco Cyber Class). The implementation of this course on e-learning system includes access to course materials, access to assignments, announcements and course information, the matter of the exercise (quiz), see the task, collecting task online, conducting discussions, sharing of information and enrich knowledge through related sites. This is enough to provide motivation for students to improve their competency subjects related to this field of science related.

Student motivation in learning have a significant effect on study results. Student motivation to learn needs to be done with an needs analysis of students, the right approach and intensive discussions. This research was focused on give motivation to student in order to obtain a competency, get a good value and need for achievement. This work done continuously and sustainable so that the results achieved in accordance with the purpose of which is expected.

There is a positive correlation between the use of e-learning to increase motivation to learn between the direct observation, reports from LMS and quosionairy. Student motivation to study this impact on the improvement of student learning that are visible from the end of the show from 58,6 into 73, 4 at the end of the semester.

## D. Conclusion

a. The implementation of blended learning model in Electromagnetic Fields Course give motivation to the students indicated by the presence of students in the class, frequency of activity in learning process, activity in discussions, ask questions and conduct the exercise problem.

b. Blended learning model give significant benefit to the students that was indicated by average score 3.34 on the likert scale from the questionnairy.

c. Implementation of blended learning model in Electromagnetic fields course give increase the competence of student from 58.6 to 73.4.

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