

THE IMPLEMENTATION OF E-LEARNING TO INCREASE STUDENT'S MOTIVATION IN ELECTROMAGNETIC FIELDS COURSE

Muhamad Ali
Yogyakarta State University
Website : [Http://www.elektro.uny.ac.id/muhal](http://www.elektro.uny.ac.id/muhal)
Email : muhal@uny.ac.id

Abstract

The ultimate goal of this paper is to explain the role of e-learning as learning media to increase student's motivation on electromagnetic fields course. Electromagnetic field is one of the subject courses in Electrical Engineering Education Department that have implemented in e-learning systems. The method that was used in this paper is study of the implementing e-learning in Electromagnetic Fields course. The effect of implementation e-learning in learning process was measured by direct observation, elearning report by Learning Management Systems (LMS), quetionary and test to the students. This results show that e-learning can increase the student's motivation that shown by frequency and duration of students in access the e-learning in Electromagnetic fields subject. There is a positive correlation between the direct method, e-learning report and quetionary. From the students questionnaire was get that the average score is 3.34 in likert scale in motivation increasing. The result of study students were increased from 58.6 to 73.4 by using e-learning.

Keyword: motivation, e-learning, competence, electromagnetic fields, learning media

A. Introduction

E-learning is one of the media and learning technologies that has experienced rapid growth. Schools, educational institutions and universities begin to discuss, implement and evaluate e-learning. The development of e-learning in the Yogyakarta State University (YSU) started in 2005. Electrical Engineering Education Department (EEED) is a pioneer in the development of e-learning in Yogyakarta State University (YSU). PHKA2 program (an Indonesian government grant on a competition basis) has facilitated the development of the innovative learning through research, training and teaching in EEED.

Electromagnetic Fields is one of the subjects that has implemented e-learning. The application of e-learning on this subject is based on several factors such as 1) easier to distribute the material course, 2) there are many holidays in the academic calendar of YSU, 3) some lecturers often have many activities such as, research, seminars and social dedication, 4) provide experience to students to use information and communication technology in learning and 5) to optimize learning (Ali, 2006).

The characteristics of Electromagnetic Field course is quite difficult to learn, because it is abstract and contains elements of mathematics, specific vector coordinates in three-dimensional cartesian, tube and ball and equality differential related to the wave nature.

The special characteristics of the subject and the conventional learning process result in low students' achievement. The average score of each semester is below the B score, so many students must repeat this subject in the next semester. Learning process still focus on clarifications on the abstract concepts through lectures and they are illustrated through pictures on the blackboard and the Over Head or the LCD projector. Sometimes the process of learning in the classroom can not be forced to remember the limitations of time.

These problems must be solved by applying creative and innovative methods in the learning process. Using e-learning as a media utilizing information and communication technology is expected to increase student motivation to learn the subject so that they can increase their achievement on the subject.

B. Student Motivation

Successful student learning goals (student competency) in the lecture is influenced by several factors, among others; learning atmosphere, teachers, the learning, the media used and the motivation of students (Ali, 2007). To build this competency requires business students from a self-motivated learning, guidance from the lecturers, the learning environment conducive to learning and the media support.

Maslow in Ali (2007) explains that motivation can be defined as power (energy) that can cause someone persistency level and enthusiasm in implementing an activity, whether that comes from within the individual itself (intrinsic motivation) or from outside the individual (extrinsic motivation). How strong motivation of the individual will determine the quality of displaying the behavior, both in the context of learning, work and life in others.

Motivation is the set of reasons that determines one to engage in a particular behavior. The term is generally used for human motivation but, theoretically, it can be used to describe the causes for animal behavior as well. This article refers to human motivation. According to various theories, motivation may be rooted in the basic need to minimize physical pain and maximize pleasure, or it may include specific needs such as eating and resting, or a desired object, hobby, goal, state of being, ideal, or it

may be attributed to less-apparent reasons such as altruism, morality, or avoiding mortality.

Study of motivations in education has attracted educators, managers, and researchers, primarily associated with the interest on the efforts of achievement of someone performance. In the context of psychological studies, Makmun in Sudrajat (2007) reveals that the motivation to understand the individual can be seen from several indicators, including: (1) the duration of activities, (2) the frequency of activities; (3) persistensi on activities; (4) determination, tenacity and ability in face difficulties and obstacles, (5) devotion and sacrifice to achieve goals; (6) level of aspiration to be achieved with the activities carried out; (7) level of qualification achievement or product (put out) that achieved from the activities of conducted; (8) attitudes towards the direction of the target.

To understand the theory of motivation, it is imperative to consider some of the theories of motivation, such as : (1) Abraham H. Maslow Theory (Needs Theory), (2) Motivation Theory from McClelland (achievement Needs Theory), (3) theory Clyton Alderfer (Theory Erg); (4) theory of Herzberg (Two Factor Theory), (5) theory of justice; (6) determination Theory purposes; (7) Theory Victor H. Vroom (expectancy theory), (8) The theory and behavior modification, and (9) Compensation Related to the theory of achievement (Suderajat, 2007)

C. E-Learning

There are many definitions about e-learning, but in this article e-learning is defined 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 ways to provide training, educational or learning material (Stockley, 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 implementations of e-learning now are very wide, but they are based on a principle that e-learning is an effort in distributing learning material through electronic media. Students and teachers can access it any time, any where and by any one. The characteristics of e-learning are a flexible and adaptable learning in distance learning and the distribution of learning material (Surjono, 2007).

D. Elco Cyber Class (EEED E-Learning)

EEED has developed and implemented e-learning to improve the quality of learning. The Information Technology Team (Tim TI) of EEED has developed it with Moodle learning management systems (LMS). Elco Cyber Class system can be accessed through the URL: <http://elektro.uny.ac.id/elearning>. One of the advantages for the lecturers is the easiness to create online course based on LMS. This is because the teacher does not need to know much about web programming, so that time can be used more to reflect on the content of learning that will be submitted (Alan 2001). In addition to the LMS using Moodle, so EEED tend to follow the e-learning paradigm that allows the integrated works in the "knowledge sharing" among the large universities in Indonesia (through inherent).

Display front page of the e-learning Elco Class Cyber Education Department of Electrical Engineering FT UNY (<http://elektro.uny.ac.id/elearning> and <http://elektro-uny.net/moodle>) can be seen in the image below.

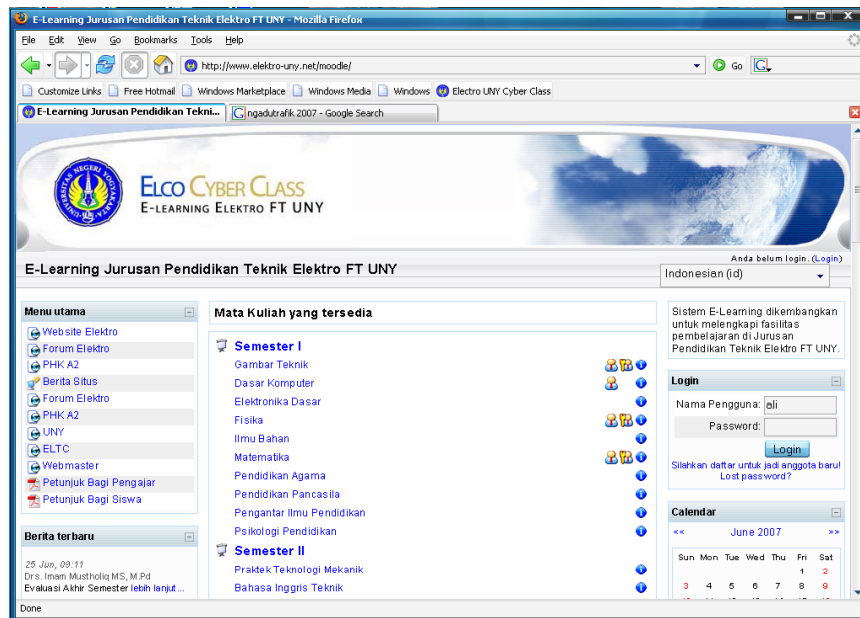


Figure 1. EEED E-Learning (Elco Cyber Class)

E. Method and Design

Measuring the influence of e-learning on student motivation in Electromagnetic fields course is conducted by using:

- Direct Observation to the students and benchmark the class room learning and using e-learning.
- Analyze the report of student activities in e-learning that was generated by LMS
- Testing to measure the result of study of students before and after using e-learning in the class.
- Questionnaire to students.

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

Criteria	Score
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- Very good 4
- Good 3
- Enough 2
- Bad 1
- Very Bad 0

F. Result and Discussion

1. Direct Observation

Based on the researcher's direct observation of a fundamental difference in the learning process in classroom and e-learning is the level of student attendance, students' activity in asking and responding questions. At the lecture in class, in each meeting on average student attendance rate is below 85% and students are usually very passive and defensive. This means they prefer to be quiet and avoid dialogues. If the lecturer asked, "is there any question?", most students are silent, and asked if a case they are also still afraid to reply.

Learning with e-learning is quite different because the meeting is done in the virtual world so that the average student attendance can reach 100% because the available time is very long (24 hours in 7 days). Students can access e-learning both synchronously with the presence of the lecturers or other friends and asynchronously. Active students more visible on asking question, activity in forum discussion, responding to problems, answer questions and adding new information from the internet. This is because students have the freedom to think, find out information and communicate with others.

2. Student's Activity Report By E-learning

One of the advantages 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-learning in a 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.

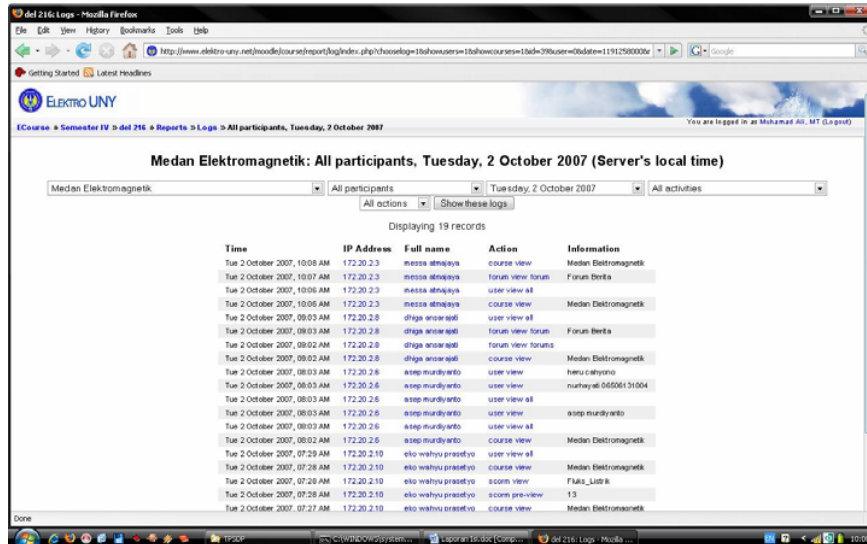


Figure 2. Student's activity report by E-Learning

3. Questionnaire Result

Measurement is done through questionnaires that were spread to students who use e-learning. The measurement is 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 questionnaire can be seen in table 1.

Table 1. The result of students' questionnaire

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 influences students' learning outcome (Ali, 2007). From the results of the test, it indicates that before using e-learning the average score of students (measured through pre test) is 58.6, and after using e-learning the test results is 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, questionnaires and the result of test, the implementation of learning in Electromagnetic 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.

Students' motivation in learning has a significant effect on their study results. Student motivation to learn needs to be done with a needs' analysis on the students, the right approach and intensive discussions. This research focused on giving motivation to students in order to obtain a competency, a good value and need for achievement. This work is done continuously and sustainable so that the results achieved is in line with the expected purpose.

There is a positive correlation between the use of e-learning to increase students' motivation to learn between the direct observation, reports from LMS and questionnaire. Student motivation to study has an impact on the improvement of

student learning. This is shown by their increasing score, from 58.6 up to 73.4 at the end of the semester.

G. Conclusion

From the results of the discussion, some conclusions that can be drawn are as follow:

- a. By direct observation, e-learning can increase student's motivation to learn. It is shown by the increased level of attendance in e-learning course, increased interaction between students - students and students - lecturers, increased ability in problem-solving exercises through e-learning.
- b. The results from the questionnaire show that e-learning can increase students' motivation to study with average score of 3.34 on likert scale, e-learning has a significant benefit for students with score of 3.47, and e-learning is able to increase interaction between students and lecturers with score 3.83.
- c. The implementation of Electromagnetic fields course in e-learning increases the competence of student from 58.6 to 73.4.

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