International Journal of Social Science Research and Review

http://ijssrr.com
editor@ijssrr.com
Volume 5, Issue 8
August, 2022
Pages: 485-491

Study of Implementation of Case Method with LMS-Based Self-Study System in Electronic Engineering Education Study Program

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http://dx.doi.org/10.47814/ijssrr.v5i8.506

Abstract

Case method learning as one of the learning methods applied at Nusa Cendana University aims to improve problem-based higher order thinking skills. This learning is generally carried out in the form of face-to-face, but in this study, the case method was applied using LMS. The purpose of this study is to examine how the implementation of case method learning is carried out using LMS media in Electrical Engineering Education students. The research method used in this study is descriptive qualitative using data collected on google form as many as 15 questions using a Likert scale and 5 essay questions that have been validated. The research subjects were 65 students in the Electrical Engineering Education Study Program. The results obtained are 61.15% of respondents know about the case method learning, 60.00% have applied the case method in the course, 50.77% have implemented the case method in over 7 meetings in 1 semester. In LMS all features are available including discussion rooms with clear learning steps in LMS, but still 54.62% of students have difficulty understanding case-based learning methods using LMS, according to respondents the application of LMS is much more effective in the face-to-face form than LMS, where 45.38% of students still have difficulty understanding the material using the LMS-based case method. The conclusions that can be drawn from this research, in terms of the facilities available in the LMS, it is very possible to apply the case method. The case method steps have been systematically arranged in the LMS and even discussions can also be facilitated, but it is not enough to accommodate the needs in problem solving when using the LMS, the application of LMS offline or face to face by respondents is much more effective than LMS, this is because students do not all understand the case method and are not used to learning based on the case method because in one semester the application of the case method is less than 50% of the entire meeting, students have difficulty understand the material using the case method in LMS-based learning because the use of the LMS is less than optimal in building discussions and also the limitations in conducting problem studies through web

meetings because even though the lecturer has given the material but still needs a direct explanation, because the learning patterns used are developed so far is face-to-face learning and tends to receive lecturer-centered information and does not train themselves to learn independently. From the results of this study, things that need to be addressed from the application of case method learning when using LMS, communication between student lecturers need to be maximized, then students need to encourage themselves to study independently and try to develop their learning independence by increasing their learning motivation.

Keywords: *Case Method; Independent Learning; LMS-Based; Electrical Engineering Education*

Introduction

The dynamics of the application of learning from time to time always undergoes many changes according to the development of the times and also certain situations, early 2019 learning which has been carried out in conventional form in this case learning face to face face to face gradually have to adjust to new conditions or the new normal along with the development of technology that easily facilitates online-based learning including using LMS.

Learning in the new normal is currently changing the order in the implementation of learning. The application of learning that has been carried out face-to-face has shifted and is dominated by learning using various online/network facilities. In this study, the learning facilities to be studied use the Learning Management System (LMS) at Nusa Cendana University with the website address www.elearning.undana.ac.id. The use of LMS is in line with the learning approach which has also undergone many changes in the learning structure, usually adjusted to a certain time and place, currently learning anytime and anywhere, and flexibly giving students the freedom to learn. Research by Bersin et al (2009) shows that more than 70 percent of large companies have an LMS already and almost a third of these companies are considering replacing or "upgrade" this system with an integrated talent management system. The advantage of LMS is that this software can make it easier for humans to process administrative and learning data using the internet. LMS which is applied in learning at Undana, facilitates students to learn using various learning methods that encourage them to study independently. Students access classes on a specific schedule that has been agreed with the supervising teacher. On certain websites, video call content is available so that students can meet face-to-face with the supervising teacher so as to allow the teaching and learning process to occur more effectively like in a classroom. Virtual classrooms must create a conducive, interactive, and dynamic learning environment. Among other things, this can be realized by formulating clear and specific learning objectives, compiling good teaching materials, and facilitating reciprocal communication between students and teachers. In virtual classes the teacher can monitor the progress of student achievement by holding discussion forums on the available content (Priowirjanto, 2013).

The application of Independent Learning, can not be separated from the courses that are applied to the LMS platform, while the subjects studied are students of the Electrical Engineering Education Study Program. In this study, the learning format used in the delivery of learning as well as the application of Independent Learning is the Learning Management System (LMS). The use of this LMS is based on the main consideration, namely as a learning medium developed by the University of Nusa Cendana. In this LMS the features provided are also complete, including being able to do virtual face-to-face. However, the most important thing is that the uploaded material can be studied by students and then they are asked to develop their ability in independent learning, and developing questions for themselves can be done flexibly after the material is uploaded and given directions by the lecturer. With flexible time, it can provide sufficient space for students to be able to reflect on the subject matter they are studying.

Through the application of LMS-based learning, it is hoped that students can develop their learning abilities using learning methods that can be applied in LMS.

The learning applied at Undana is the case method, Case-Based Teaching is one method that can be used when dealing with online lectures. Case-Based Teaching is a learning method based on an analysis in solving a problem. So, in Case-Based Teaching, students will be invited to observe a problem that occurs, both conceptually and theoretically. Later, the student will be directed to dig deeper into a problem which will then be solved based on the existing theory.

Steps for Case Based Learning

According to Arends (2012), there are five steps for implementing PBM, namely:

1) Orientation to problems. educators present real problems to students.
2) Learning organization.
3) Individual and group investigations.
4) Development and presentation of problem solving results.
5) Analysis and evaluation of the problem solving process.

The advantages of applying the case method learning are that students can implement theory into real contexts, think creatively and innovatively about complex situations and can determine what steps to take, besides that through the case method they can improve their ability to process information, compare and evaluate their own views with the views of others (William, 2005). The case method helps the occurrence of 'knowledge transfer' from the material being studied (Saleewong, 2012). Furthermore, the case method also relates the differences between theory and practice (Flynn, 2001). So that students not only know the theory but can apply it in daily life. Referring to the case method learning steps, the content that must be provided in the LMS needs to accommodate the case method based learning steps that will be applied in this study.

Research Methods

A. Research Design

This research is a non-experimental research, which is classified as a descriptive research. The instrument used in this research is a questionnaire/questionnaire that will be filled out by research subjects at the LMS. The questionnaire/questionnaire contains 15 statements using a Likert scale consisting of 4 choices and 5 questions to answer which are used to obtain information from research subjects related to the application of the case method using LMS. The questionnaire/questionnaire instrument was not tested but only validated by linguists to avoid ambiguity or double meaning of the questions in it.

In terms of how to answer it, the questionnaire used is included in a closed questionnaire, because the research subjects have provided answers. Judging from the answers, the questionnaire used in this study was a direct questionnaire because the research subjects answered directly based on their choices. To explain their choice of the 15 statements, 5 questions were added for students to answer so that they could strengthen the study related to the application of the case method in the Electrical Engineering Education Study Program.

B. Research Subjects

This research was conducted at the Electrical Engineering Education Study Program with the number of respondents involved in this study amounting to 65 students spread over the second, fourth, sixth and eighth semesters.

C. Research Procedure

The technique/method used in collecting data in this research is a questionnaire technique.

1) The questionnaire data obtained from each respondent will be recapitulated based on the questions given through the help of excel which consists of 15 statements and 5 questions.
2) The answers from the respondents were then tabulated to obtain a score from the results of the data tabulation.
3) Furthermore, the scores obtained from the tabulation results are analyzed so that each question related to the application of the case method in the LMS will produce a certain value.
4) Drawing conclusions from the results of the questionnaire scores.
5) After that, a recapitulation will be made in the form of a percentage tendency for the implementation of the case method from students of the Electrical Engineering education study program;

Results and Discussion

A. Research Results

This research was conducted at the Electrical Engineering Education Study Program, FKIP University of Nusa Cendana. To obtain data, a questionnaire was used which was uploaded to the LMS which was then filled out by students as a means to obtain research data. Research data according to research indicators are shown in table 1.

Table 1. Indicators of statement items and percentage of answers

Statement Items Statement	%	Answers
1	Know about learning the case method	61.15
2	The courses that I program apply the case method	60.00
3	More than 7 meetings in 14 meetings in 1 semester apply the case method	50.77
4	Learning using the case model is easy to understand using e-learning/LMS	53.08
5	The steps in implementing the case method are very clearly written in e-learning/LMS	61.54
6	In applying the case method model students are given space for group discussion	66.92
7	The mechanism of group discussion using e-learning by applying the case method / Problem Based Learning is easy to implement	60.00
8	Case method / Problem Based Learning using e-learning is as good as face-to-face	54.23
9	Case learning / Problem Based Learning is very help me in understanding lecture material	54.66

10	Features available in e-learning support the application of the Case method / Problem Based Learning	59.62
11	Application of Case Method / Problem Based Learning is written clearly in LMS	59.62
12	I understand well the problems raised in learning by applying case method / Problem Based Learning	59.23
13	Exercises given in In my opinion LMS leads to problem solving	60.38
14	Problems raised in LMS learning can be easily solved	63.08
15	Problems raised in the application of case method / Problem Based Learning refer to real daily conditions	60.38

In addition to the 15 statements chosen by the students, 5 questions were also given to be answered in writing as follows: (1). What do you know about the Case Method learning model, (2). How many courses do you program apply the Case Method learning model, (3). If the case learning method uses e-learning, is it easy for you to learn the material, give reasons, (4). Describe the learning steps if the lecturer applies Case Method learning in e-learning. (5). Can the application of the case method improve your analytical skills and have an impact on your daily life, please explain. Based on the 5 questions given, the study of respondents' answers is as follows: (1). All respondents can provide a theoretical definition of the case method, (2). There are 2 to 6 courses that apply the case method, (3). The material delivered through LMS is easy to understand, (4). The learning steps of the case method written by the respondents varied greatly, (5). The answers given related to the application of the case method can improve students' analytical skills and have an impact on daily life. The answers are very theoretical and do not touch the practical application related to course material that applies the case method and helps them relate it to their daily lives.

Discussion

Based on the research data that is adjusted to the questions in table 1, the trend of implementing the case method in the Electrical Engineering Education Study Program is shown in Figure 1.

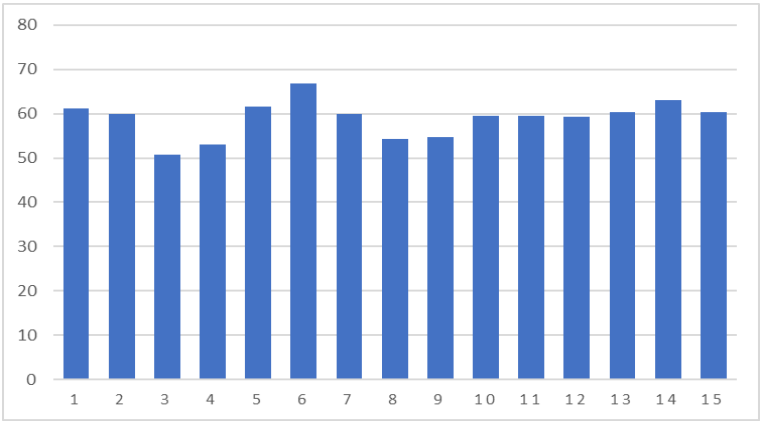

Figure 1. Implementation of the Case Method Application using LMS

Based on the research data shown in table 1 and also Figure 1, it shows that the trend of implementing the case method with 15 statement items and 5 essay questions is in the range of 50.77% to 66.92% who have applied the case method or 33.08% up to 49.23% have not implemented the case method. The percentage of each question is described as follows: 61.15% of respondents know about the case method learning, 60.00% have applied the case method in the course, 50.77% have applied the case method above 7 meetings in 1 semester. In LMS all features are available including discussion rooms with clear learning steps in LMS, but still 54.62% of students have difficulty understanding case-based learning methods using LMS, according to respondents the application of LMS is much more effective in the face-to-face form than LMS, where 45.38% of students still have difficulty understanding the material using the LMS-based case method.

Judging from the facilities available in the LMS, it is very possible to apply the case method. The case method steps have been systematically arranged in the LMS and even discussions can also be facilitated, but it is not enough to accommodate the need for problem solving when using the LMS, implementing the LMS offline or face to face. by respondents it is much more effective than LMS, this is because students do not all understand the case method and are not used to learning case-based methods because in one semester the application of the case method is less than 50% of all meetings, students have difficulty understanding the material using the case method in learning-based learning. LMS is due to the use of LMS that is not optimal in building discussions and also limitations in conducting problem studies through web meetings because even though the Lecturer has given material but still needs direct explanation, because the learning pattern developed so far is face-to-face learning. advance and tend to accept lecturer-centered information and do not train themselves to learn independently.

Conclusion

Based on the results obtained from filling out the questionnaire and also the answers to the questions given, it can be concluded that the application of the case method using the LMS is largely determined by the role of the lecturer, especially in building active and maximum communication. What must be maximized is that the duration of the web meeting must be more than just material and learning steps that are loaded, this is because according to the theory written by Arends (2012), that one of the important stages of implementing the case method is the analysis and evaluation of the problem-solving process involved. requires intense discussion, which is why from the research results, many students want the application of the case method to be carried out face-to-face directly, the purpose of which is to analyze and evaluate problem solving that can be discussed in depth related to the existing lecture material.

Suggestion

Based on the results of this study, things that need to be addressed from the application of case method learning when using LMS, communication between student lecturers needs to be maximized, then students need to encourage themselves to study independently and try to develop their learning independence by increasing their learning motivation.

Acknowledgments

The team of authors expresses their deepest gratitude to the campus, namely the Electrical Engineering Education Study Program, FKIP Undana, which has funded this research.

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