The Effect of E-Learning Based on Problem Based Learning (PBL) on Student Characters in Inferential Statistics Course

Anak Agung Gede Agung[1], I Gde Wawan Sudatha[1*]

[1] *Universitas Pendidikan Ganesha, Indonesia*
[*]*Corresponding author. Email: igdewawans@undiksha.ac.id*

ABSTRACT

In the era of information technology, learning activities are no longer limited by building walls. ICT has opened wide access to participate in a more flexible learning activity. As the demands of the 21st century require the development of aspects such as cooperation, respect for opinions, knowing yourself, and others, problem-solving skills and the like need to be cultivated in learning. In fact, character as human behaviour is now becoming more attractive through the educational process using e-learning. This study aims to determine the significant effect of PBL based e-learning on the character of the fourth semester students in the Department of Educational Technology. This type of research is a quasi-experimental study using a post-test control group design. The study population was 36 fourth semester students consisting of 2 classes, namely class A (experimental group) and class B (control group). Data were collected using non-test instruments. The research data were analysed using t-test statistics assisted by the SPSS program. The average score of the experimental class characters was 88.15 and the control class was 78.26. Based on the t-test, it shows a significance smaller than 0.05, so that there are significant differences in character between students who learn using PBL based e-learning and students who learn with direct instruction-based e-learning. Thus, it can be concluded that there is a significant effect of PBL based e-learning on the character of students who take inferential statistics courses in the Department of Educational Technology.

Keywords: Character, E-Learning, Learning, Problem-Based Learning

1. INTRODUCTION

In the era of information technology, learning activities are no longer limited by building walls. ICT has opened wide access to participate in a more flexible learning activity. Likewise, in the future, students will be able to participate in the same learning process on other campuses through online-based distance learning. With the Internet, it has been possible to hold distance learning, which is more efficient by connecting students with teachers in different places. Internet technology also makes it easier for students to access material, view their grades online, check learning progress, view class schedules, send assignments given by lecturers and so on.

Considering that the Internet is very familiar to teenagers, it would be wiser if it is used by teenagers for their learning purposes as well as a medium of entertainment. However, there is a tendency that often occurs where the Internet is more widely used as a medium of entertainment such as chatting on social media, watching videos, playing games, and so on. Students still very minimal use the Internet for their learning purposes. If this phenomenon occurs continuously, students will prefer social media on the Internet rather than choosing to learn. This problem will have an impact on decreasing learning activities as well as student learning outcomes.

E-learning is often referred to as the use of information technology networks and communication technology in learning [1]. A number of other terms are also used to describe the concept of e-learning. There are online learning, virtual learning, network and web learning. Basically, all of these terms refer to a learning process that makes use of information and communication technology. The term e-learning is more than just learning online, learning through cyberspace, network and web-based learning, but e-learning is combining all learning activities, whether individual or

group work online or offline via a network or independently by computers and other electronic devices.

Clark [2] suggests that an e-learning program can be effective, it must pay attention to six principles. These six principles concern media elements in e-learning that Clark mentioned, which are the basics of developing media in e-learning. First, the multimedia principle, which explains that adding graphics to text can increase learning excitement. Graphics should be in harmony with the message conveyed in the text. Graphics are also able to give the impression of entertainment and not a dramatic impression. Because, a dramatic impression can actually reduce motivation to learn.

According to Surjono [3] there are several steps to develop an e-learning portal using Moodle, including: free web hosting registration which can be used to create an e-learning portal with Moodle, adjust the identity of the portal, change the theme, create categories, create users, appoint user status, registering as a user, changing personal profiles, changing course settings, entering learning materials, creating quizzes, creating and managing assignments, creating discussion forums, and entering chats.

Problem-based learning (PBL) began at McMaster University in Hamilton, Ontario, Canada, in the late 1960s. PBL was created as a philosophical guide for the development of new medical schools. Teaching students to remember basic medical information, which is intended for them to be able to answer tests in lectures, causes them not to know how to apply information to the real world and forget it so quickly.

Wheeler, et.al. [4] define PBL as learning based on 'thinking through' real life problems or more precisely awareness of situations. According to Arends [5] PBL can be traced through the three main streams of 20th century thought. First, Dewey and the Problem-Oriented Classroom; John Dewey's view that schools should be laboratories for solving real problems. Second, Piaget, Vygotsky, and Constructivism; constructivist learning theory that emphasizes the need for learners to investigate their environment and build personally meaningful knowledge. Third, Bruner and Discovery Learning; Discovery learning emphasizes active, student-cantered learning where learners find ideas and get their meanings. Arends [5] explains that there are five main activity stages that can be applied in PBL. The PBL process starts from student orientation to the problem, then organizes students to learn, guides investigations in groups, develops and presents work, and analyses and evaluates the results of problem solving. Presentation of the problem to be solved by students is done in the first stage.

Thalib, et. al. [6] suggested the following characteristics of problem-based learning: (1) presentation or question, (2) focuses on interdisciplinary linkages, (3) authentic investigation, (4) produces products or works and displays them, and (5) cooperation; learning is characterized by students working collaboratively with one another.

In the research we have studied character as a factor that has to be considered in e-learning In detail, the research questions are Is there a significant effect of problem-based learning-based e-learning on the character of the fourth semester students in the Educational Technology Department?

2. METHODOLOGY OF RESEARCH

This research is an experimental research. Given that not all variables (symptoms that appear) and the experimental conditions can be strictly regulated and controlled, this study is categorized as quasi-experimental research. The research design used in this study is presented in Figure 1.

E	:	O1	X	O2
C	:	O3	-	O4

Figure 1. Pre-test Post-test Control Group Experiment Design

The population of this study was 37 semester IV students in the Educational Technology Department, consisting of 2 classes. Given the small number of populations, this population is used as the research sample. Data were collected using non-test instruments. The research data were analysed using t-test statistics assisted by the SPSS program.

3. RESULT AND DISCUSSION

3.1. Result

Research on the application of e-learning was carried out for one semester online or in a network (online). The variable observed was the character of students of the Educational Technology Department, Faculty of Education, Semester V, Academic Year 2019/2020. In the experimental class, learning was implemented using e-learning problem-based learning (PBL), while in the control class, e-learning direct instructional (DI) was applied.

In the experimental class, the emphasis is on giving cases in each lecture and in the control class, students are only given assignments that have certain data to be analysed. The description of student character data in both the experimental class and the control class is presented as follows.

Table 1. Character Data Description

Variabel	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Experiment Class Character	20	28	69	97	1763	88.15	7.95	63.29
Control Class Character	15	25	66	91	1174	78.26	6.78	46.06
Valid N (listwise)	15							

Based on the Kolmogorov-Smirnov normality test, it shows that: (1) the experimental class learning outcome data obtained sig 0.109, (2) the control class learning outcome data obtained sig 0.200, (3) the experimental class character data obtained sig 0.144, (4) class character data control obtained sig 0.200. Thus, it can be concluded that the four variables obtain a significance above 0.05 so that the four data groups of these variables are normally distributed.

The average score of the experimental class characters was 88.15 and the control class was 78.26. Based on the t-test, it shows a significance smaller than 0.05, so that there are significant differences in character between students who learn using PBL-based e-learning and students who learn with direct instruction-based e-learning (DI).

3.2. Discussion

To understand whether e-learning affects student character, the learning process must be a concern. The results showed that e-learning had a significant effect on student character. The findings of this study are in line with previous studies [7][8].

Learning with e-learning and integrating character in the learning process has an influence in shaping student character. The integration of character education in the e-learning learning process provides the principles of a good character culture. Basic character education enhances ethical values of good character. In learning with e-learning, it increases the community between students to care for each other.

4. CONCLUSIONS

Based on the results of the research and discussion, the following conclusions were obtained. The characters between groups of students learning with problem-based learning-based e-learning and between groups without e-learning showed a significant difference. A significant difference shows that learning with problem-based learning e-learning has an effect on character compared to learning without e-learning.

AUTHORS' CONTRIBUTIONS

The author's contribution to this article is the preparation of instruments, data collection, data analysis, and article writing.

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