

The effect of e-learning media on the improvement of learning outcomes in the Vehicle Body Construction course for students of the Department Automotive Faculty of Engineering UNP

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Abstract

Research-based on data on the low student learning outcomes. Internal and external factors cause little learning outcomes. Previous research has concluded that valid and practical E-learning media will streamline the learning process. Research focuses on one of the external factors that cause low learning outcomes. E-learning media is an external factor that is the focus of research. This study aims to analyze the E-learning media on learning outcomes. The analysis results will provide an overview of E-learning media's influence on improving learning outcomes. The increase in learning outcomes in the form of post-test scores on E-learning media is carried out. This research is an experimental study with a randomized control-group post-test only design, where the research subjects were students majoring in automotive engineering. Samples were taken randomly using data collection in data test for student learning outcomes in the Automotive Engineering Department, Faculty of Engineering, UNP. The collected learning outcome test data were analyzed according to the data analysis process, and the results were tested to examine E-learning media's effect on improving student learning outcomes. The test results showed an increase in learning outcomes by 25.33%. The research concludes that E-learning media has no significant impact on learning outcomes.

Keywords: E-learning media, Learning Outcomes, Student, Automotive

1. Introduction

The Covid 19 pandemic situation has a very significant impact on education. One of the impacts is changing models, methods, strategies, techniques, and their application in the learning process. This change is by the focus of the 4.0 industrial revolution related to technical mastery. The form of technical ability that must be mastered during the Covid 19 pandemic and industrial revolution 4.0 is the internet. The world of education is now carrying out the learning process through the internet network. The conditions of the Covid 19 pandemic require learning to be carried out without face-to-face learning. Learning conditions that are not face-to-face/long-distance will certainly keep educators and students exposed to the covid 19 viruses. The world of education carries out the learning process with internet technology using various learning platforms/media that educational institutions have provided. Numerous learning media use internet technology, one of which is E-learning media. E-learning media is provided in the form of a learning management system. Some literature reveals that the learning process is very effective when done with Electronic learning / E-learning [1].

Higher education becomes an educational institution where graduates will be prepared to become human beings who can academically apply, develop and create science and technology and have the responsibility and obligation to carry out roles and functions to achieve national education goals. During the Covid 19 pandemic, universities carried out a learning process using E-learning media. Colleges prepare their respective E-learning media platforms. Higher education during a

pandemic condition requires that all learning processes be carried out remotely. Distance learning / online can use various E-learning models. E-learning learning is expected to have better student learning outcomes. This situation is because students can independently find materials.

Advances in technology have changed aspects of the learning process. Currently, both lecturers, teachers, and students must be technologically illiterate (clueless), literate (understand), and skilled in using internet networks. Through the mastery of internet network competencies, it is expected that the learning media with E-learning will be successful so that the E-learning media will give students the ability to overcome the limitations of teaching materials. Internet is one of the media that will always be connected with E-learning media. The ability to provide online learning will create students' conditions to learn independently. As users of E-learning media, students will learn online and using online modules, video, audio, and discussions as learning resources. The teacher acts as a mediator to provide direction to students using the supporting facilities and infrastructure inside and outside the school. Educators' development and use of internet technology will ultimately increase learning outcomes [3].

E-learning is one of the learning media that will improve learning outcomes. E-learning learning will provide easy access and learning process for students to study anywhere and anytime without being limited by time. There are several advantages in using E-learning media in learning, as described bellows.

1. Equitable distribution of education throughout the region and unlimited carrying capacity
2. The learning process is not limited by time
3. The selection of topics or teaching materials is tailored to your wants and needs
4. The period of time can be adjusted according to the abilities of each student
5. Learning materials are more accurate and continuously updated
6. Learning can be done interactively [4]

The learning process's success using E-learning media certainly requires lecturers and teachers to develop various learning media on the given E-learning media. E-learning media's developments should be oriented towards increasing student activities effectively during learning. The evolution of learning media by the wants and needs will create a comfortable learning atmosphere for students to actively learn and have fun to achieve optimal learning outcomes [5].

The form of the learning process's success is the result of learning. Learning outcomes in the learning process are in all student activity in E-learning media. Many factors can determine learning outcomes. Some research literature determines two factors that influence learning outcomes. There are internal factors and or external factors that influence learning outcomes. Previous research revealed that one of the internal factors of motivation affects learning outcomes. [6] The learning process is carried out with E-learning media; in the end, an assessment will be given to all student activities in undergoing the learning process. Therefore, the learning process using E-learning media must be provided in an innovative form to increase activity.

Learning outcomes in various literature pieces are also referred to as learning achievement. According to Kamus Besar Bahasa Indonesia (KBBI), learning outcomes can be interpreted as an achievement. Achievement is a result that has been achieved, done, done, and so on. The form of learning achievement consists of three domains, namely: the cognitive domain (learning achievement), the affective domain (attitudes), and the psychomotor domain (learning achievement skills and the ability to act). Students obtain learning achievements after carrying out teaching and learning activities. Learning achievement using E-learning media is also from changes in a person's behavior, be it cognitive, affective, or psychomotor. The form of learning achievement is made in numbers or letters. External factors also determine the success of a learning process. Previous research articles described external factors of socioeconomic status and the campus environment as influencing learning outcomes [7]. The research focuses on examining the significance of other external influence factors in E-learning media on improving learning outcomes.

2. Method

Research is a type of experimental research. In the field of education, empirical research is divided into two types. Research carried out in the laboratory and outside the laboratory [8]. The subject of education is student/college students, so relevant experimental research is outside the laboratory to maintain conditions in the experimental variable, ease providing treatment, condition closer to ideal situations, and more actual testing results. In education, empirical research is suitable because the teaching method can be set according to the student's need and can be compared according to the actual situation. It can apply principles and theoretical studies into applied science by the requirements of the problems faced by educational institutions.

The research focus is on actual experiment research with a post-test-only control design. The research design consisted of two classes chosen randomly. The class's initial condition will be given a pretest to determine the difference in the initial state between the experimental and control groups. In this study, two types of samples were used: the Experiment class and the Control class, where these two classes received different treatments.

Table 1. Research design

Class	Treatment	Posttest
Experiment (X1)	X	T
Control (X2)	-	T

Subject research is a student majoring in automotive Faculty of EngineeringUNP with a total of 28 students. The research subjects were divided into two groups by 14 people in the experimental class and 14 people in the control class [9]. The research variables are independent variables (E-learning media) which are stimuli that work on individuals and the environment that affect behavior. The dependent variable (increased learning outcomes) responds to the study's behavior. The obtained data is the learning result data from the Vehicle Body Construction course. Data collection was obtained after obtaining post-test scores using E-learning media. This study's data collection technique was a post-test question using E-learning media given to D3 students in the Vehicle Body Construction course.

The post-test questions were given to one of the practical classes and then treated using E-learning. Post-test questions used as a reference for assessment must be valid and reliable. The data collection of learning outcomes tests is objective tests to measure cognitive learning outcomes. In this cognitive assessment, a final examination is given in a multiple-choice test with five answer choices. The test will be carried out after learning the Vehicle Body Construction course, and this test was based on the teaching and learning process's material. The final test shows the Vehicle Body Construction course's learning outcomes after being given treatment.

Following are the analysis steps to test the post-test questions to see the effect of E-learning media on learning outcomes.

2.1 Analysis of the validity of the test items

The test questions used must be validated first before the post-test questions were carried out, test questions were carried out first. The test questions have analyzed the validity of the item questions.

2.2 Reliability analysis of test items

The reliability of the item is needed to measure the extent to which a study result test question can be trusted to be accurate, consistent, and stable anytime, anywhere, and by whoever the exam is carried out, examined, and assessed.

2.3 Analysis difficulty index test questions

It shows how difficult or easy the questions will be.

2.4 Analysis of the difference in test questions

Power different items aim to determine the ability among the samples in the study to answer test questions. A question is suitable for use as a research test tool after carrying out the four analyses above. The analysis results contained 20 questions that were appropriate to be used as post-test questions. Furthermore, they are given post-test questions to measure students' abilities. The data from the post-test questions were analyzed. The following is an overview of the analysis carried out on the post-test questions.

2.5 Analysis of the normality test

Based on the data analysis results, data is normally distributed, with values in the Experiment class and Control class normal.

2.6 Homogeneity test analysis

Result data analysis obtained the results of the data distribution is homogeneous.

2.7 Hypothesis Test Analysis

Measure hypotheses and conclude existing standards. The hypothesis test concludes that there is no significant effect of E-learning media on improving learning outcomes.

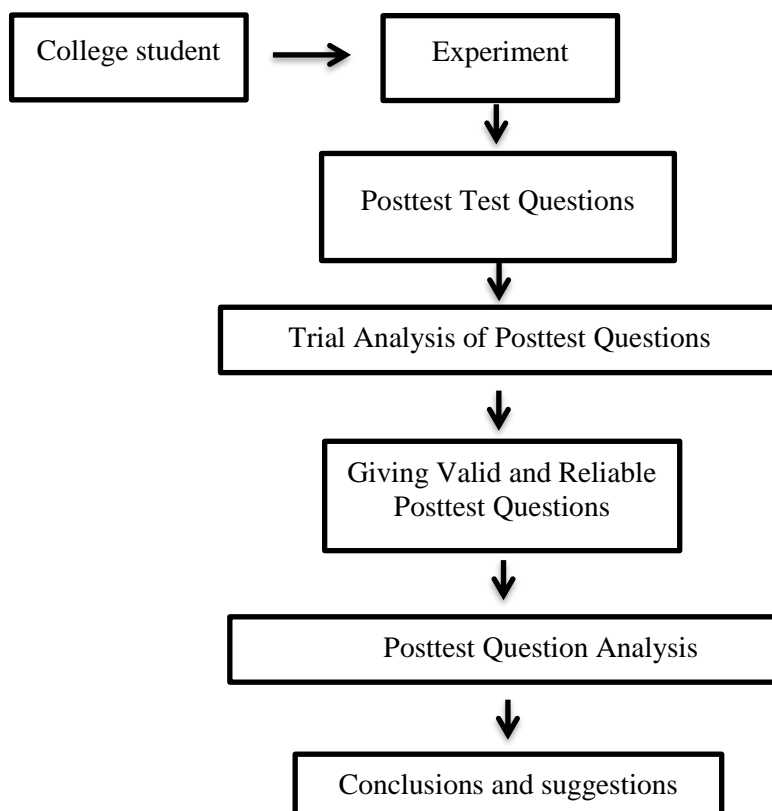


Figure 1. Research Flowchart

3. Results and Discussion

The provided analysis post-test question tryout aims to measure the post-test questions' validity and reliability. Result in The test analysis of post-test questions obtained 20 valid post-test questions with a high-reliability level. Furthermore, a test on the level of difficulty and the power of difference was carried out. At the level of difficulty carried out by the analysis results, five questions were too

easy, and the post-test questions were 20 questions. The difference power test of the questions produces a different power that is not much different for each question.

Furthermore, the analyzed post-test questions are given to investigate the E-learning media's effectiveness on learning outcomes. The post-test questions used were 20 objective questions. Post-test questions were given to both sample classes. Data will be obtained about student learning outcomes at the end of the data providing post-test questions—description of data from the final test results of the two sample classes.

Table 2. Data on average student learning outcomes

Class	N	\bar{X}	S	S2
Experiment	14	67.14	13.66	186,662
Control	14	63.57	13.2	174.34

Based on the table's data, the average student learning outcomes in the experimental class treated with E-learning media are not significantly different from the control class. Next, the data normality test was carried out. The following is a description of the data normality analysis carried out.

Table 3. Normality Test Data

Class	N	α	L0	Lt	Analysis	Information
Experiment	14	0.05	0.154857	0.2368	L0 < Lt	Normal
Control	14	0.05	0.051529	0.2368	L0 < Lt	Normal

Standard data for the experimental class and control class were in a normal distribution. Then proceed with the homogeneous test. The following is an overview of the results of the data homogeneity test.

Table 4. Test Data Homogeneity

Class	α	F count	F table	Analysis	Conclusion
Experiment	0.05	0.9338	2.60	F count < F table	Homogeneous
Control					

The data distribution is homogeneous and feasible to continue with hypothesis analysis. The hypothesis result made about student learning outcomes can be seen in the data description of the hypothesis analysis results of the two classes of research samples using the t-test.

Table 5. Hypothesis Test Data

Class	t count	t table	Analysis
Experiment	0.68	2.06	t count < t table
Control			

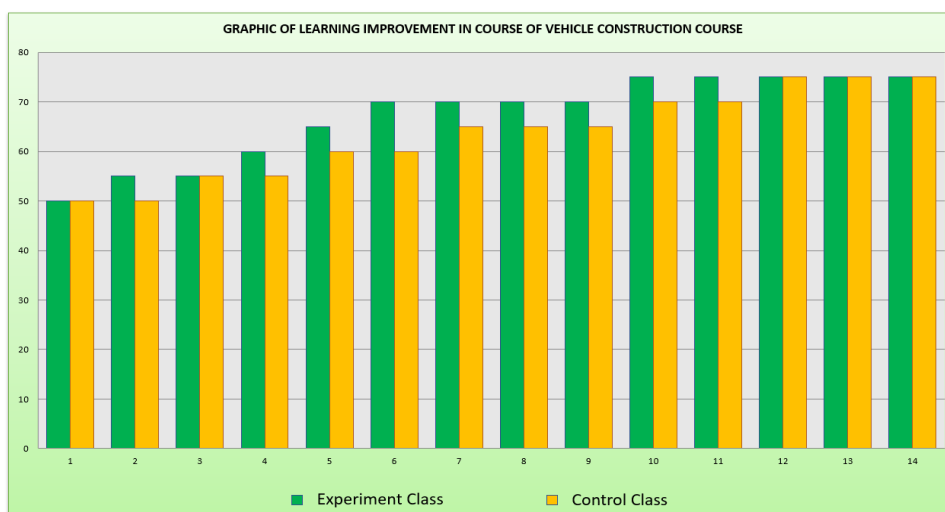
Result-test analysis obtained a t-value of 0.68, at the significant level of 0.05 with a t-table value of 2.06, thus t count < t table. Based on the analysis, it is concluded that E-learning media has no

significant effect on improving student learning outcomes of the Automotive Engineering Department, Faculty of Engineering, Padang State University.

Use E-learning media at universities and other educational institutions will provide students flexibility in regulating learning speed and choosing the sequence of learning activities according to their needs. The conditions during the Covid-19 pandemic required that all those involved in face-to-face matters, including the lecture process, had to be replaced with learning from home or more commonly known as Work From Home. Conditions like this allow E-learning media to support lecture activities from home. E-learning media will make it easier for students to access any lecture material that takes place from wherever they are. Apart from that, this is also beneficial for the teaching staff/lecturers. Educators can still carry out all lecture obligations wherever they are so that all the material provided can and the ultimate goal of learning can be achieved.

The hypothesis analysis results show that the E-learning media used does not significantly increase learning outcomes for the Automotive Engineering Department students. This can be seen in the t-test results. Several factors can influence this. Kominfo Indonesia in the online CNN Indonesia website provides an overview of internet network problems in Indonesia. This flexibility causes the internet network's quality to be uneven in the area where each student lives [10].

The following is a graphic image of an increase in learning outcomes in the experimental and control classes.



The graph shows that the E-learning media provided to students of the Automotive Engineering Department. It can be concluded that the chart does not have a crucial effect on increasing learning outcomes which is not significant by the E-learning media for students of the Automotive Engineering department. Further research is needed to see the factors that have a considerable effect on improving student learning outcomes.

4. Conclusion

The data analysis concluded that E-learning media's use did not significantly improve student learning outcomes in the Automotive Department, Faculty of Engineering, Padang State University. The increase in learning outcomes obtained through the post-test value analysis amounted to 25.33%. The increase in learning outcomes should be more than 75%. So it takes a combination, innovation and creativity in E-learning media to be used in the learning process to improve learning outcomes. Furthermore, the next researcher suggests examining other factors that are suspected of influencing learning outcomes besides E-learning media. Thus, a complete and comprehensive overview of the various factors that are thought to improve learning outcomes will be even more significant.

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