Mechanical Engineering Education Journal
Vol. 1, No. 1, pp. 8 – 13, 2023

ISSN 2987-7717

The Effectiveness of The Use of Learning Videos in Machine Maintenance Courses in Improving Learning Outcomes and Practice

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Article history:
Received 04th December 2022
Revised 28th January 2023
Accepted 20th February 2023

https://doi.org/10.24036/meej.v1i1.6

Published by:
Universitas Negeri Padang.

Abstract

The real implications of the lack of students understanding of machine maintenance lectures are often encountered when practicing in workshops. This will impact the running of the practice in the workshop as in the production process of a project. One of the things that makes this problem happen is because of the insufficient attention and motivation of the student. In overcoming issues like this, innovation in learning is needed, such as using learning videos. This study aims to reveal the conventional way of using learning videos in machine maintenance courses. This type of research used is quantitative research with the quasi-experiment method. Testing the hypothesis with the T-test obtained a sig2-tailed value of 0.019, and the calculated T is known to be 2.603, which is known that the matter is <0.05, which is applied at a level of 5%. The use of learning video media in the learning process in class reveals that it dramatically influences student learning outcomes. Where this is very effectively used to improve student learning outcomes.

Keywords: Effectiveness, Learning Video, Machine Maintenance, Learning media

Introduction

Education becomes a significant factor in individual success (Emputri et al., 2019). Education is an activity that is deliberately done to form a good person (Putra et al., 2021). Good personal formation process through learning activities (Izzudin & Suharmanto, 2013). The implementation of education is closely related to learning (Hidayat et al., 2020). So education can be successful if the learning process provided is good or on target (Putu, 2019).

Learning is a comprehensive activity that contains components and learning activities to obtain results (Primawati, P.., Ambiyar, A., &, Ramadhani, 2017). Learning requires a well-organized network (Indrawan & Rifelino, 2014). In this era of technology, many things can be used to achieve learning success (Sumar & Razak, 2016). Success in learning there are methods, models, and media used. Media is one component that supports learning (Ulfah et al., 2016). In learning, media is used to communicate with educators with students (Tafonao, 2018). Media in learning can make it easier for students to understand the material (Rini et al., 2023; Tutiasri et al., 2020).

Machine maintenance is one of the main points in mechanical engineering. Maintenance is the discipline that studies the activities of maintaining or maintaining equipment facilities (Syaputra, 2020). Given the importance of machine maintenance for the development of production technology, it is required for students to understand the competence of lectures (Bagus et al., 2023; Prasetya et al., 2023). To succeed in this lecture, a good part of planning is needed in this learning.

The real implications of the lack of students understanding of machine maintenance lectures are often encountered during practice in workshops. This will impact the training course in the workshop, such as in the production process of homework. One of the things that makes this problem happen is because of students' low attention and motivation. Issues such as being influenced by internal actors and

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environmental factors (Tasya Nabillah & Abadi, 2019). In overcoming problems like this, innovation in learning is needed, such as using learning media because learning media plays a role in learning (Shalahudin, 2019).

Learning media is learning support for students (Jennah, 2009). The use of learning media can provide an innovation in delivering learning materials. In general, learning media are often used, such as whiteboards, but basically, the use of whiteboards still makes students less interested in delivering material that will impact learning outcomes. So that in overcoming problems like this, creativity is needed to maximize learning media. One example is learning videos. Learning videos are audio and visual media to aid learning. In this study, learning videos were used, which contained lecture materials on machine maintenance. So the use of learning videos is expected to improve student learning outcomes.

Based on research that has been conducted by (Hendriyani et al., 2018) regarding the analysis of the need to develop video-tutorial-based learning media where it is known that the results of the research that video tutorials can facilitate students' learning, both with educators and independently, meaning that videos can have a positive impact on learning outcomes. This research aims to reveal the difference in learning conventionally with the use of learning videos in machine maintenance courses.

Methods

Types of Research

The type of research used is Quantitative research. Quantitative analysis is based on the philosophy of positivism, which emphasizes objective phenomena that are studied quantitatively or carried out using numbers, statistical processing, structure, and controlled experiments (Nana Sudjana, 2010). This research uses the quasi-experiment method is a study used to determine the effect of the treatment given (Sugiyono, 2019).

Population and Sample

The population is the area of the object/subject of study (Sugiyono, 2019). The population of this study is students of the S1 Mechanical Engineering Study Program FT UNP class of 2020 who concentrate on machining as many as 30 people. Sample determination: If the study has a population of > 100, then 15-30% of the population is sampled, but if < 100, the entire total population is sampled (Arikunto, 2017).

Results and Discussion

Test Analsysis Prerequisties

Normality Test

The normality test is applied to express the value data of each normally distributed t class (Yudono & Widodo, 2016). Data is called normally distributed if sig-tailed > 0.05.

Table 1: Control Class Normality Test

	Kolmogorov Smirnov		
	Statistics	Df	Sig
Pre Test Control	.194	15	.133
Post Test Control	.190	15	.153

The table above shows the normality analysis of control class data. This is known in the pre-test data. The sig value is 0.133; in the post-test, the sig value is 0.153, meaning the Kolmogorov-Smirnov sig value > 0.05, meaning the normal data distribution.

Table 2: Experimental Class Normality Test

	Kolmogorov Smirnov		
	Statistics	df	Sig
PreTest	.210	15	.073
Post Test	.213	15	.064

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The table above shows the normality analysis of experimental class data. This is known in the pre-test data, the sig value is 0.073, and in the post-test, the sig value is 0.064, meaning the Kolmogorov-Smirnov sig value > 0.05 distribution of data in the standard experimental class.

Homogeneity Test

The homogeneity test serves to determine the learning outcomes data of the class group has a homogeneous nature (Yudono & Widodo, 2016). The data is called homogeny sig Based on Mean > 0.05.

Table 3: Homogeneity Test

	Levene Statistic	df1	df2	Sig.
Based on Mean	.196	1	28	.662
Based on Median	.211	1	28	.650
Based on Median	.211	1	27.5	.650
Based on trimmed	.194	1	28	.663

The above results are known to be the price of sig Based on Mean 0.662 (sig Based on Mean > 0.05), meaning that the data variants of both classes are homogeneous.

Descriptive Test

Description of Experimental Class Learning Outcomes Data

The following are the results of the analysis of the pre-test and post-test experimental class data description.

Table 4: Descriptive Analysis of Experimental Classes

		Pre Test	Post Test
N	Valid	15	15
	Miss	0	0
Average		79.73	84.27
Middle Value		80.00	84.00
Modus		76[a]	84
Std. Deviasi		4.652	5.338
Min		72	76
Max		88	92
Total		1196	1264

Pre-test

The implementation of learning in the experimental class was given in the form of tests, namely pre-test, where the mean value of learning outcomes was 79.73, median 80, and mode 76. The data comes from the number of students, as many as 15 people.

Post-test

The implementation of learning in the experimental class is given in the form of tests, namely the pos test, where the mean value of learning outcomes is 84.27, median 84, and mode 84. The data comes from the number of students, as many as 15 people.

Description of Control Class Learning Outcomes Data

The following are the results of the analysis of pre-test and post-test descriptions of control class data.

Table 5: Control Class Descriptive Analysis

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		Pre Test	Post Test
N	Valid	15	15
	Miss	0	0
Average		77.87	79.73
Middle Value		76.00	80.00
Modus		76[a]	80
Std. Deviasi		4.502	4.652
Min		72	72
Max		88	88
Total		1168	1196

Pre Test

Implementing learning in the experimental class is given through tests, namely pre-test, where the mean value of learning outcomes is 79.73, median 80, and mode 80. The data comes from the number of students, as many as 15 people.

Post Test

Implementing learning in the experimental class is given as tests, namely the post-test, where the mean value of learning outcomes is 77.78, median 76, and mode 76. The data comes from the number of students, as many as 15 people.

Test the Hypothesis

Hypothesis testing is carried out to see the influence of the learning outcomes of each group. The T-Test looks at the average comparison between the two groups. Data is said to be related or related if the value of sig2-tailed < 0.05.

Table 6: T Test

	Levene test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances	.196	.662	2.480	28	.019
Equal variances are not assumed.			-2.480	27.486	.020

The analysis found sig (2-tailed) class groups of 0.019 (< 0.05) and a t count of 2.480. What can be concluded is that there is an influence on learning outcomes.

Percentage of Learning Outcomes Experimental and Control Class

The post-test scores obtained are the difference in learning outcomes values; the experimental class is 84.27, and the control class is 79.73, a percentage.

Persentase : $(\%) = \frac{\bar{O}_1 - \bar{O}_2}{O2}$ x 100%

$(\%) = \frac{84{,}27 - 79{,}73}{79{,}73}$ x 100%

(%) = 0,0569 x 100% = 5,69 %

The calculation results obtained a comparative percentage value of learning outcomes of machine maintenance courses at the Department of Mechanical Engineering, State University of Padang, which uses learning video media and conventional learning models 5.69%, which means that the difference in the influence of the application of learning with the help of learning video media and the use of conventional learning models on student learning outcomes is 5.69% in machine maintenance courses.

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Discussion

Learning by Using Learning Videos in Machine Maintenance Courses In this study, learning was carried out using learning media in the form of Videos. In the application of knowledge using media in the form of videos, it is known that there is an increase in student activity and interest in learning. This happens because, according to them, learning videos help them understand learning material. Learning with the help of this video is more fun, and they do not readily feel bored during learning. This is in line with the study's results (Arcat, 2020), which state that learning using the help of videos makes the learning process not rigid. This will directly impact understanding and learning outcomes that are increasing.

The conventional or direct method is a learning model applied to students with educators as the center of knowledge, so teachers only give lectures or presentations about learning. In this study, the conventional learning model was applied to a student class called the control class. And it is known that in learning using this traditional model, many students still feel bored with the learning process, which indirectly impacts the learning outcomes obtained by these students.

Conclusion

The results of this study show an increase in learning activity from students using learning with the help of learning videos against the use of conventional learning. The use of learning video media in the learning process in the classroom is felt to be very influential and effective, which helps improve student learning outcomes. Judging from the percentage of comparison of known learning outcomes, the calculation results obtained a comparative percentage value of learning outcomes of machine maintenance courses at the Department of Mechanical Engineering, State University of Padang, which uses video learning media and conventional learning models of 5.69%.

Acknowledgement

Thanks to the Department of Mechanical Engineering for supporting the completion of the article as a requirement in obtaining a Bachelor of Mechanical Engineering Education FT UNP. Thank you to Mr. Bulkia Rahim and Dr. Rizky Ema Wulansari for research validator.

Declaration

Author's Contribution

Fajar Imanda Efendi is a researcher and data collection, Zainal Abadi is the one who directs the method and process of making, Yufrizal is the one who evaluates the results of the research data, and Febri Prasetya is the one who considers the research.

Funding statement

The research did not receive specific grants from any funding agency in the public, commercial, or nonprofit sectors.

Conflict interest

The authors declare no conflict of interest.

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