

## The Effectiveness of The Use of Simple Teaching Aids on The Learning Motivation of Class X Students of SMK Kristen Harapan Rantepao on Business And Energy Materials

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### Abstract

The purpose of this study is to determine the effectiveness of the use of simple teaching aids on the learning motivation of grade X students of SMK Harapan Kristen Rantepao. In this study, the method used was an experimental method with a quasi-experimental research design of a nonequivalent control group design. The sample in this study is students of class X Tab B and X Tab H of SMK Harapan Kristen Rantepao. The instruments used in this study are test and questionnaire instruments. Data analysis technique using SPSS 21.

The results of the study showed that the use of teaching aids as a learning medium could increase the motivation to learn physics of grade X students of Harapan Rantepao Christian Vocational School on business and energy materials. This can be seen in the experimental class from an increase in the average pretest result of 28.36 to 81.00 in the posttest. In the control class, the average increase in pretest test results of 27.73 increased to 76.36 in the posttest. Meanwhile, in the t-test, the sig value (2-tailed) was  $0.005 < 0.05$ . These results show that there is a difference in student learning outcomes between the experimental class and the control class.

**Keywords:** Teaching Aids, Learning Motivation,

### A. Introduction

Education is essentially to change human behaviour and develop the potential that exists in oneself. (Nevid et al., 2011) Human beings are the object as well as the central subject in the development of the advancement of the times, so that humans are the initiators and implementers of education. In Law of the Republic of Indonesia Number 2 of 1989, education is defined as a basic effort to prepare students through guidance, teaching, and/or training activities for their future roles. One of the subjects in school that is a means for the improvement and development of the nation's life intelligence is physics.

(Fidan & Tuncel, 2021) Physics is one of the fields of Natural Sciences that studies knowledge and phenomena of the universe in a systematic way. Physics is a subject that requires a deeper understanding, because in addition to the many illustrations of pictures, symbols and formulas are used using the sense of sight. With the limitation of the sense of

vision, it is difficult for students to understand the material because they are only able to imagine. (Cahyono et al., 2018)

An effective learning process can be said to be successful if it achieves the learning objectives. (Mariyam & Riwayati, 2018) These goals are students' abilities ranging from cognitive, effective and psychomotor which can be in the form of learning outcomes. Teaching aids are media that are used as a tool to understand learning materials so that they are very useful for teachers and students. Learning using props can cause interest in learning, a sense of pleasure and interest during the learning process in the classroom. The learning process is said to be very effective because in using teaching aids because students are required to actively participate in the learning process. The use of teaching aids is one of the most important aspects of the use process which is very closely related to the activities of the learning process. (Engmann, 2023) Teaching aids have an important role for educators and students, namely 1) helping students understand the concept of the material provided, 2) helping educators carry out the learning process, 3) providing motivation to students to be more active and active in learning, 4) helping students to be more active in the learning process.

Motivation is very important in the learning process. Because a person who does not have motivation in learning, it is impossible to do learning activities. A person who is strongly motivated will work hard, seems persistent and does not want to give up, on the other hand, someone who is weak in motivation, seems indifferent, easily discouraged, does not pay attention to learning, likes to interrupt in class, often leaves the classroom, as a result of which he experiences many learning difficulties and low learning results. The purpose of this study is to determine the effectiveness of the use of simple teaching aids on students' learning motivation in business and energy materials.

## B. Review of Related Literature

A number of studies have investigated the impact of teaching aids on student motivation. For instance, a study by (Darwina et al., 2022) found that the use of visual aids and interactive materials significantly increased students' engagement and interest in the subject matter. Similarly, research by (Jamet & Le Bohec, 2007) on multimedia learning suggests that simple and well-designed teaching aids can enhance cognitive processing and retention, which in turn can boost motivation.

In the context of vocational education, teaching aids play a crucial role in bridging the gap between theoretical knowledge and practical application. For example, a study by Stone and (Sugiman et al., 2020) indicated that vocational students, including those in business and energy sectors, benefit from hands-on activities and practical demonstrations that simple teaching aids facilitate. These aids help in contextualizing theoretical concepts and enhancing practical skills, which can significantly impact students' motivation

For business-related subjects, teaching aids such as charts, case studies, and simulation software are commonly used. Research by (Collins & Etemadidavan, 2021) highlights that business simulations and interactive case studies help students understand complex business concepts and encourage active learning. Simple aids like flowcharts and

infographics also help in breaking down complex information into more digestible parts, thereby maintaining students' interest and engagement.

In the field of energy education, simple teaching aids like models of energy systems, diagrams, and hands-on experiments are particularly effective. Studies such as those by (Musielewicz et al., 2022) demonstrate that practical models and interactive simulations in energy education not only clarify theoretical concepts but also stimulate students' curiosity and motivation. These aids help students visualize and experiment with energy concepts, leading to a deeper understanding and sustained interest in the subject.

**C. Method**

This research is a quantitative research with an experimental method. (Gyanthi et al., 2023) Quantitative research is research with data in the form of numbers and analysis using statistics. While the experimental method is a research method used to find the influence of a certain treatment. The form of experiment in this study is *Quasi Experimental Design* with a type of *posttest only control design*, which places the research subjects into two classes which are divided into the categories of experimental class and control class and the two classes are selected by *cluster random sampling*.

**D. Result**

In this study, the experimental class was given treatment, namely learning using simple props while the control class was with conventional learning (with the lecture method).

Table 1. Research design

<i>Pretest</i>	<b>Treatment</b>	<i>Posttest</i>
O1	X	O2
O3	-	O4

Information:

O1= *Random* (initial state of the experimental group)

O3= *Random* (initial state of the control group) X=Treatment (treatment using simple props)

O2= Effect of treatment

O4= Influence of non-treatment

The experimental group was the group that was given the treatment (x), while the other group was not. The group that is not given treatment is called the control group. The two groups were given a pretest to find out whether there was a difference between the two experimental and control groups in the initial state.

After that, the experimental group was given treatment, then a posttest was held to find out the effect of the treatment given. The control group was not given



treatment but was still held posttest. The results of the control group posttest were used as a comparison of the impact of the treatment given to the experimental group.

### Results and Discussion

In this study, the researcher took data from 33 students in class X Tab B as an experimental class and 33 students in class X Tab H as a control class. The implementation of this research is by providing pretest questions before and posttest questions after teaching business and energy materials by learning using simple props in class X of SMK Kristen Harapan Rantepao. Furthermore, this data was analyzed using descriptive statistics. The results of the study are as follows.

#### 1. Descriptive analysis data

- a. Data on student pretest results

To find out the initial ability of students, a statistical test was first carried out on the pretest in the experimental class and the control class. The data of the pretest score can be seen in Table 4.1

**Table 2.** Descriptive statistical test data of student pretest scores

Material	Class	N	Minimum	Maximum	Mean	Std. Deviation
Effort and Energy	Pretest Control	33	12	42	27,73	6.761
	Pre-test experiments	33	16	42	28,36	6.163

**Table 3.** Completeness frequency data on student pretest data

Material	Class	N	MOH	Frequency	Category
Effort and Energy	Control class	33	$\geq 75$	0	Complete
			$< 75$	33	Incomplete
	Experimental Classes	33	$\geq 75$	0	Complete
			$< 75$	33	Incomplete

Based on **Table 2**, the students' pretest scores on business and energy materials for the control class were obtained with a maximum score of 42, a minimum score of 12, an average score of 27.73 and a standard deviation of 6.761. In the experimental class, the maximum value was 42, the minimum value was 16, the average value obtained was 28.36, and the standard deviation was 6,163. Based on **Table 3** above on business materials and energy, the number of respondents in the experimental class and control class amounted to 66 respondents who did not reach the KKM score.

b. Student Posttest Result Data

To find out the ability of students after learning, statistical tests were carried out on the posttest in the control class and the experimental class.

**Table 4.** Descriptive statistical test data of student posttest scores

Material	Class	N	Minimum	Maximum	Mean	Std. Deviation
Effort and Energy	Posttest control	33	62	90	76,36	5,803
	Post-test experiments	33	63	95	81,00	7,040

Completeness frequency data on student posttest data

Material	Class	N	MOH	Frequency	Category
Effort and Energy	Control class	33	≥75	23	Complete
			<75	10	Incomplete
	Experimental classes	33	≥75	27	Complete
			<75	6	Incomplete

Based on **Table 4**, the students' posttest scores on business and energy materials for the control class were obtained with a maximum score of 90, a minimum score of 62, an average score of 76.36 and a standard deviation of 5.803. In the experimental class, the maximum score was 95, the minimum score was 62, the average score was 81.00, and the standard deviation was 7.040. In the business and energy materials, the number of respondents in the control class is 33 respondents who have reached the number of KKM 75 totaling 23 students and 10 students who have not reached the KKM, in the experimental class there are 33 respondents who have reached the number of KKM 75 totaling 27 students and 6 students who have not reached the KKM can be seen in **Table 5**.

Thus, it can be concluded that learning using teaching aids on business and energy materials can improve student learning outcomes in class X of SMK Kristen Harapan Rantepao.

c. Data on the results of the student motivation questionnaire

To find out the level of learning motivation of students, the researcher conducted a statistical test on the initial motivation and final motivation of students. Data on the initial and final motivation of students can be seen in **Table 6**

**Table 6.** Criteria for initial motivation of students

N Value	Category	f	%
$86\% \leq X < 100\%$	Very high	-	-
$71\% \leq X < 85\%$	Tall	6	18%
$56\% \leq X < 70\%$	Keep	25	76%
$41\% \leq X < 55\%$	Low	2	6%
$0\% \leq X < 40\%$	Very Low	-	-
Sum		33	100%

The following is a table of students' final motivation after being given treatment in the form of physics prop-based learning.

**Table 7** Criteria for final motivation of students

Value	Category	f	%
$86\% \leq X < 100\%$	Very high	3	9%
$71\% \leq X < 85\%$	Tall	25	76%
$56\% \leq X < 70\%$	Keep	5	15%
$41\% \leq X < 55\%$	Low	-	-
$0\% \leq X < 40\%$	Very Low	-	-
Sum		33	100%

Based on the table above, the initial motivation value of students in class X Tab B on the subject of business and energy, shows that out of 33 students there are 6 students who have learning motivation in the high category, 25 people in the medium category and 2 people who have learning motivation in the low category. In **Table 7**, it can be seen that there are 3 people (9%) who are categorized as having a very high level of motivation with the use of physics teaching aids, 25 people (76%) who have a moderate level of motivation in learning using physics teaching aids.

## 2. Inferential Statistical Analysis

This analysis is a data processing using the help of the SPSS program to test whether laboratory-based learning can improve the learning outcomes of grade X students of SMK Kristen Harapan Rantepao.

### a. Data Normality Test

#### 1). Pretest and posttest data

The normality test was carried out to find out whether the data on learning outcomes obtained, both from the control class and the experimental class, were normal or not. In this study, the data normality test was carried out using the Kolmogorov-smirnov test at a significance level of  $\alpha = 0.05$ . The normality test in the control class and the experimental class was carried out with the help of the SPSS version 21 for windows program, where it was obtained that the data obtained was normal distrib. The results of the normality test can be seen in **Table 8**

**Table 8.** Results of the Normality test for class X of SMK Kristen Harapan Rantepao

Class	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Mr.	Statistic	df	Mr.
Pretest H(Control)	,119	33	,200*	,980	33	,774
Posttest H(Control)	,116	33	,200*	,968	33	,422
Pretest B(Experiment)	,133	33	,147	,972	33	,539
Posttest (Experiment)	,102	33	,200*	,975	33	,644

From the table above, it can be seen that the significance value of the test results of the control class in the pretest is 0.200 and in the posttest is 0.200. In the pretest, the experimental class was 0.147 and the posttest was 0.200. Because the significance value in the table is greater than 0.05 (sig > 0.05), it can be concluded that the value of science physics learning outcomes of students in class X of SMK Harapan Rantepao Christian is distributed normally.

#### 2). Motivation of students

The results of the normality test of the initial and final motivation data questionnaire of students can be shown by the normality data test table using the SPSS 21 program, using Klomogorov-Smirnov.

**Table 9** Results of the normality test of initial motivation and final motivation data

	Class	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Mr.	Statistic	df	Mr.
Learning motivation	Initial motivation	,107	33	,200*	,968	33	,422
	Final Motivation	,117	33	,200*	,939	33	,063

From the results of the *one sample kolmogorov-smirnov test* with the condition that  $Asymp. Sig > 0.05$ , then the results were obtained at the initial motivation of  $0.200 > 0.05$  and the final motivation of  $0.200 > 0.05$ , then it can be concluded that the data used is normally distributed.

a. Homogeneity Test

The homogeneity test is used to find out whether the data obtained is homogeneous or not. This test was carried out using the SPSS version 21 for windows program, with the results in Table 10 below.

**Table 10** Results of the homogeneity test of class X of SMK Kristen Harapan Rantepao

	Levene Statistic	df1	df2	Mr.
Based on Mean	2,170	1	64	,146
Based on Median	1,887	1	64	,174
Based on Median and with adjusted df	1,887	1	63,686	,174
Based on trimmed mean	2,130	1	64	,149

**Discussion**

Based on the results of the data management that has been described in the descriptive analysis, it shows that the average posttest score of the control class on business materials and energy was obtained with a maximum value of 90, a minimum value of 62, and an average value of 76.36 with a standard deviation of 5.803. In the experimental class, the maximum score of 95, the minimum score of 62 and the average score obtained were 81.00 and the standard deviation was 7.040. In the control class, namely 33 respondents who reached the number of KKM 75, there were 23 students and 10 students who had not reached the KKM. In the experimental class, there were 33 respondents who reached the KKM of 75, totaling 27 students and 6 students who had not reached the KKM.

Based on the normality test using SPSS, the significance value of the test results of the control class in the pretest was 0.200 and in the posttest was 0.200. In the pretest, the experimental class was 0.147 and in the posttest, it was 0.200. Because the significance value in the table is greater than 0.05 ( $sig > 0.05$ ), it can be concluded that the value of physics learning outcomes of students in class X of SMK Kristen Rantepao is normally distributed. In the homogeneity test, the value of the significance level of student learning outcomes was  $0.146 > 0.05$ , so it can be concluded that the data is homogeneous. Where this homegenity test is carried out to find out whether two or more groups of sample data that have been taken come from populations that have the same variance or not. In the Independent sample T-test, a sig value (2-tailed) of  $0.005 < 0.05$  was obtained, so there was a significant difference between the learning outcomes of students in the experimental class and the control class.



In the student learning motivation questionnaire with the number of respondents of 33 students, the average initial motivation of students was 66.45 and the final motivation was 77.91. From the student motivation questionnaire, it was also seen that the average motivation of students before being treated was only in the medium category, which was 76%, and the rest were in the high category, which was 18% and the low category, for the final motivation of the students, the average was in the high category, which was 76%, the very high category was 9%, and the medium category was 15%.

## E. Conclusion

The use of physics teaching aids is effective in students' learning motivation. This can be seen from the initial motivation of students before being given the average treatment is in the medium category, which is 76%, while after being treated in the form of learning motivation props, the average student is in the high category, which is 76%. The use of simple teaching aids as a learning medium to improve the learning outcomes of grade X students of SMK Kristen Harapan Rantepao. This can be seen from the data analysis through tests that have been carried out, namely in the control class with a minimum value of 62 and a maximum value of 90, while in the experimental class the minimum value of 63 and the maximum value of 95 and the significance value (2-tailed) of  $0.005 < 0.05$ . These results show that there is a difference in student learning outcomes between the experimental class and the control class.

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