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Wilcoxon's Method in Determining The Effect of Using *Discovery Learning* Learning Strategies on The Learning Outcomes Of Vocational Basic DPIB Grade X Students.

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ABSTRACT

One of the Discovery Learning Learning strategies is one of the efforts made by teachers to improve student learning outcomes by providing opportunities for students to learn on their own from various sources they like. The purpose of this study is to determine the effect of using discovery learning strategies on learning outcomes. In this study, the author used an experimental method with a type of quantitative research using SPSS which focuses on the Wilcoxon test to analyze data and answer research results. The respondents in this study amounted to 35 DPIB grade X students at SMK Negeri 2 Sungai Penuh. Based on the results of the Wilcoxon test, the results of Asymp Sig 0.0 2 where < of 0.05 means that this indicates that there is an influence of the use of discovery learning strategies on the learning outcomes of Basic Vocational Education of grade X DPIB students.

Keywords: *wilcoxon, discovery learning, learning outcomes, influence*

INTRODUCTION

Learning is an activity carried out by every human being to change the behavior of both one's attitude and knowledge, (Maâ, 2018) Learning is an important aspect for a person in living an individual life or society, how to apply one's values, culture and experience. Learning can also make someone innovate to improve welfare and continue civilization (Parwati, et al 2023) Learning is an aspect of basic needs for every human being, inseparable in human life, humans are equipped with reason and mind that have the potential to be taught and formed through the learning process by obtaining goals and expected results. (Festiawan, 2020).

The learning process of seeking knowledge can be done anywhere using media and can be obtained by conducting dialogues, reading books, conducting research and so on. Learning is a process of remembering, gaining knowledge, and a process that can be done anywhere and anytime in obtaining a truth or a skill that can be mastered and can be used according to needs, (Hasriadi in Fatimah 2022).

In the learning process, strategy is needed so that learning can run according to plan. Many strategies or methods are carried out in the learning process. (Larasati in Safitri., et al 2021) argues that one of the learning strategies is to investigate themselves from various learning sources, so that the material obtained by students is easier to remember, strategies. *Discovery* learning is a model of developing active learning methods, by obtaining and reviewing yourself, the results obtained will continue to be remembered. (Hosnam, in Prasetyo et al 2021).

To determine the success of the learning process, teachers must be able to determine the right method of teaching that suits their learning style and interests so that it can attract the attention of students. (Hisbullah et al in Primadoniati, 2020) argue, learning outcomes are influenced by several factors that arise from within and outside students or approaches or strategies in the teaching and learning process.

Based on the results of interviews and observations to the class to DPIB class X vocational base teachers, students tend to be passive and lack enthusiasm in participating in learning. There are only a few students who are able to follow, which is delivered by the teacher through the lecture method and demonstration with some teaching aids. Students tend to get bored reading teaching modules and textbooks that have been distributed to them. Then the teacher practices one of the learning strategies, namely *Discovery* learning , how it affects student learning outcomes.

Based on the above problems, the researchers conducted a study on how the effect of the application of Discovery learning strategies on the basic vocational learning outcomes of class X DPIB at SMK Negeri 2 Sungai Penuh, with data analysis using the Wilcoxon approach, so that

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differences in student learning outcomes before and after the implementation of the *Discovery learning* strategy are known.

RESEARCH METHODS

In this study, the author uses qualitative research, with experimental methods by observing actions taken to check hypotheses or explore causal relationships between emerging gejaya, as well as to check hypotheses whether or not there is an influence of *Discovery* Learning learning strategies on Learning Outcomes.

The determination of respondents in this study used a random sampling technique, where the author took random ensembles in a population. This research instrument uses observation sheets in the form of student learning outcomes. By collecting value data before using the Discovery Learning learning strategy, and grades after using the *Discovery Learning* strategy, with data analysis techniques using SPSS with the initial steps of determining hypotheses, analyzing data, testing homogeneity, normality tests and using the Wilcoxon test.

RESULTS AND DISCUSSION

Based on the application of the *Discovery Learning* learning strategy, the results of the Pretest learning outcomes before the treatment were held and the postest scores after the treatment of DPIB class X Vocational Basic subjects. As can be seen in the following table:

Table 1. Learning Outcomes of Pretest and Postest Students in Basic Vocational Subjects class X DPIB

NO	RESPONDENTS	VALUE	
		PRETEST	POSTEST
1	Air conditioning	80	91
2	BW	78	89
3	TL	71	62
4	HI	78	82
5	ZA	82	83
6	RS	83	73
7	SA	76	78
8	GL	75	83
9	YL	69	82
10	TE	64	89
11	IT	78	62
12	JO	83	89
13	UG	76	83
14	OAK	82	85
15	PA	87	91
16	KK	78	69
17	Free wi	71	80
18	SB	76	89
19	SL	69	91
20	MI	76	91
21	NI	73	82
22	RE	80	91

23	RP	76	83
24	FB	78	85
25	EM	73	78
26	AD	80	83
27	DD	85	85
28	FI	78	92
29	SC	89	92
30	AM	85	85
31	AK	80	91
32	AG	78	89
33	AP	71	62
34	FH	78	82
35	YM	82	83

The hypothesis of this study is the influence of value in the application of the *Discovery Learning* Strategy on the learning outcomes of class X DPIB vocational basis.

The results of the DPIB grade X Basic Vocational lesson scores using SPSS descriptive analysis of 35 respondents on the pre-test scores or scores before the *Discovery learning* strategy obtained the number of student scores of 26691, so that the average student or mean was 77.66, while the middle or median score was 78.00, with the maximum value of 35 respondents of 89.00 and the minimum value of 64.00.

Furthermore, the score after preparing the *Discovery learning* or posttest strategy, the number of scores obtained by students is 2905, with an average score of 83.00, a middle or median score of 83.00, with the maximum value of the 35 respondents is 92.00 and the minimum score is 62.00. for more details and details contained in Figure 1 below:

Statistics

		Pretest	postest
N	Valid	35	35
	Missing	0	0
Mean		77.66	83.00
Median		78.00	83.00
Mode		78	83[A]
Std. Deviation		5.407	8.444
Variance		29.232	71.294
Range		25	30
Minimum		64	62
Maximum		89	92
Sum		2718	2905

a. Multiple modes exist. The smallest value is shown

Figure 1. Statistical frequency test

Based on figure 1 above, it can be seen that there is a difference between the value before treatment or treatment after treatment or treatment.

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The next step we do a homogeneity test on the data which can be seen in figure 2 below:

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Learning outcomes	Based on Mean	2.609	1	68	.111
	Based on Median	2.763	1	68	.101
	Based on Median and with adjusted df	2.763	1	56.072	.102
	Based on trimmed mean	2.676	1	68	.106

Figure 2. Homogeneity Test

For the homogeneity test, if the sig value > 0.05, the data distribution is homogeneous, while if the sig value is < 0.005, the data distribution is not homogeneous. When viewed in Figure 2 above naiali sig from baser on mean, based on median, based on median and with adjusted df, and based on terimmed mean > 0.05 can be concluded homogeneously distributed data.

The next test is the normality test shown in Figure 3 below:

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistics	Df	Sig.	Statistics	Df	Sig.
Pretest	.125	35	.181	.979	35	.735
postest	.224	35	.000	.829	35	.000

a. Lilliefors Significance Correction

Figure 3. Normality Test

In the normality test of a data, if the sig value is > 0.05, then the data is normally distributed and if the sig value is < 0.05, it is abnormally distributed. Based on Figure 3, the learning results of students before treatment or PreTest sig value > 0.05 means normal distribution. Meanwhile, in student learning outcomes after treatment or post test, the signya value < 0.05 means that it is not normally distributed.

To answer the data that is not normally distributed, we need to do it with a non-parametric statistical test, namely, the Wilcoxon test. The test results are contained in Figure 4 below:

Ranks

		N	Mean Rank	Sum of Ranks
postest - pretest	Negative Ranks	5[A]	21.20	106.00
	Positive Ranks	28[b]	16.25	455.00
	Ties	2[c]		
	Total	35		

A. Postest < Pretest

b. Postest > Pretest

c. postest = pretest

Figure 4. Wicoxon test

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In Figure 4 above, the results of the Wicoxon test were obtained where the first negative ranks were to assess the decrease in pretest results to postest. Of the 35 respondents, there were 5 respondents who experienced a decrease in value. Then in positive Ranks, namely to see an increase in pretest results to postest, there were 28 respondents who experienced an increase in scores. And there are still 2 respondents who still get the same score between pretest and postest, from these results it can be seen that there is an increase in student learning outcomes before treatment and after the treatment of *Discovery Learning* learning strategies, although it does not apply to all students.

Furthermore, to answer the hypothesis in this study is accepted or cannot be explained in Figure 5 below:

Test Statistics[a]

	postest - pretest
Z	-3.121[b]
Asymp. Sig. (2-tailed)	.002

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Figure 5. Statistical Test

For test statistics if If Asymp. Sig < 0.05 then the hypothesis is accepted and If Asymp. Sig > 0.005 then the hypothesis is rejected. Based on the output in figure 5, that is, the statistical test above, it is known that Asymp.Sig (2-tailed) is 0.02 less than 0.05, it can be concluded that the hypothesis is accepted.

This means that there is a difference between the basic learning outcomes of DPIB Class X Vocational before Pretest and Postest, so it can be concluded that "There is an influence of the use of *Discovery Learning* learning strategies on the learning outcomes of DPIB Class X Vocational Basic students.

CONCLUSION

Based on the results of the research and discussion above, it shows that there is an influence of the use of *Discovery Learning* learning strategies on the learning outcomes of Vocational Basic DPIB grade X students, which is shown in the results of statistical tests found that there is an average increase from before the action and after the action. Then in the Wicoxon test of 35 Respondents only 5 experienced a decrease in value and 2 of the scores were still the same. And finally on the Wilcoxon signed ranks test got nailai asymp. Sig (2-tailed) smaller than 0.05, which is 0.02, shows the influence of the use of *Discovery Learning* learning strategies on the learning outcomes of Basic Vocational Education of grade X DPIB students

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