The Effectiveness of Total Physical Response and Discovery Learning Method on Students' Vocabulary Mastery

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Abstrak *– Penelitian ini bertujuan untuk mengetahui perbedaan antara siswa yang diajar menggunakan metode respon fisik total dan siswa yang diajar menggunakan metode discovery learning dalam penguasaan kosakata siswa di kelas tujuh SMPN 6 Cilegon tahun ajaran 2022/2023. Metodologi penelitian yang digunakan adalah metode kuantitatif dengan desain penelitian eksperimen semu. Instrumen penelitian ini adalah test. Penelitian ini melibatkan 33 siswa kelas eksperimen dan 33 siswa kelas kontrol sebagai sampel siswa kelas VII SMPN 6 Cilegon. Hasil penelitian menunjukkan bahwa terdapat perbedaan yang signifikan antara siswa yang menggunakan metode total physical response dan discovery learning. Berdasarkan hasil uji Wilcoxon, pada kelompok eksperimen memiliki sig 0,000 < 0,05 dan pada kelompok kontrol memiliki sig 0,034 < 0,05. Dapat disimpulkan bahwa hipotesis nol (Ho) ditolak dan hipotesis alternatif (Ha) diterima. Hasil penelitian bahwa total physical response lebih efektif daripada metode discovery learning dalam penguasaan kosakata siswa di SMP, khususnya di kelas VII SMPN 6 Cilegon.*

Kata Kunci: Respon Fisik Total; Pembelajaran penemuan; Penguasaan Kosa Kata

Abstract *- This research was about students who are taught using the total physical response method and students who are taught using the discovery learning method in mastering students' vocabulary at the seventh grade of SMPN 6 Cilegon in 2022/2023 academic year. The research methodology used was quantitative method specifically quasi-experimental research design. The instrument used in this research was test. This research involved 33 students in experimental class and 33 students in control class as a sample among the seventh grade of SMPN 6 Cilegon. The research findings result showed that there is a significant difference between students using total physical response and discovery learning method. Based on the results of the Wilcoxon-test, in experiment group has sig 0.000 < 0.05 and in control group has sig 0.034 < 0.05. It could be concluded that the null hypothesis (H$_o$) was rejected and alternative hypothesis (H$_a$) was accepted. The result of this research that the total physical response was effective than discovery learning method in mastering students' vocabulary at junior high school, espcially at the seventh grade of SMPN 6 Cilegon.*

Key words: Total Physical Response; Discovery Learning; Vocabulary Mastery.

INTRODUCTION

The most crucial aspect of learning English is vocabulary. Without vocabulary no one can speak or understand a language.(Yokubjonova, 2020) Because the ability to communicate and convey social needs cannot be delivered without having sufficient vocabulary. According to Alqahtani, the amount of words required to communicate ideas and represent the speaker meaning is known to as vocabulary.(Alqahtani, 2015) The statement means that students should improve their vocabulary if they want to deliver their ideas or communicate effectively. Vocabulary is regarded to be an important component of a language, particularly in learning a foreign language, since more one's knowledge of vocabulary, the greater one's ability to recite the phrases, clauses, and sentences.(Meung & Htut, 2021) The capacity of students to learn English, particularly to read and understand the subject, is influenced by vocabularies, and if the learners have restricted vocabularies, the ability to communicate and transmit their requirements cannot be supplied. Vocabulary needs to be emphasized more in teaching English. With sufficient vocabulary, people can communicate more easily with others, especially in spoken communication.(Kesmez, 2021) Vocabulary mastery is important because it is the key to students learning a language. It will help students in their language learning. Mastery is great skill or knowledge.(Autores, 2008) The problem that occurs at school is that students are considered difficult in memorizing and remembering vocabulary,

the students' low vocabulary skills, the teacher not use interesting method it make studens bored in learn English. These issues must be resolved because they will have an influence in the future. They will find it difficult to learn four other aspects. In learning vocabulary, students are usually given a certain number of words. Some students try to make every effort to memorize the words, but most of them are too lazy to memorize the given words. However, there are students who experience limitedness in learning English, particularly in mastery of vocabulary.

To overcome the problem, the teacher must be imaginative and innovative and use interesting teaching methods for students for generate a good class activities. The teacher must also use some of the best method, especially in teaching students of Junior High School. The teacher use method that can make the students want to take part in class learning and understand the learning material. The role of teachers as a facilitator, motivator, and learning manager is very important for implementing discovery learning in the classroom.(Saidah, 2020) The teacher plays an important role in encouraging students to think critically, work hard, and feel confident that the students can find something in their learning.(Istiqomah et al., 2018) There are many methods for teaching vocabulary, total physical response and discovery learning are methods used to teach vocabulary. Total physical response that the instructor moves further kinesthetic techniques to explain the meaning of a vocabulary word through speech and physical movement.(Alhomaidan & Alshammari, 2016). Total physical response is a language teaching method built around speech and action,that seeks to teach language by physical (motor) activity.(Richards & Rodgers, 2014) Based on the statement, by using total physical response method the students' hear verbal commands from the teacher and then the students' respond physically. Then, total physical response is in which the student answers physically to the verbal commands and can be useful for teaching English vocabulary.(Viviane Hounhanou, 2020) Total physical response also aids the cognitive development of the students; it is stimulates all their sense, their imagination, and their creativity.(Viviane Hounhanou, 2020) Discovery learning is a method of teaching where the students ask questions, construct the student own responses, and derive principles of example and principle of experiences. The other definition indicates that is a learning setting in which the learner must independently find the main substance of what is to be taught.(Hanafi, 2016). Discovery learning is a method for students to engage in problem solving while obtaining skills or knowledge.(Moore, 2014) Then, discovery learning is a method in which the teacher does not supply the final material and students must organize their information using the stimulus supplied by the teacher. The teacher serves as a guide in the learning process, and the teacher provides opportunities for students to be active.(Burhendi et al., 2019) In this case, the researcher will choose total physical response and discovery learning method. The researcher wants to conduct research to see which of the two methods is more effective for mastering vocabulary in junior high school.

RESEARCH METHODOLOGY

This research used quantitative method. The researcher used quasi-experimental design. This type of the research involved two classes. The experimental group was taught used total physical response and the control group was taught used discovery learning. Two classes were compared to find out the difference on the students' score of vocabulary.

1. **Research Design**

The research design of the study can be illustrated as follows:

Class	Pre-test	Treatment	Post-test
VII.3	O_1	X_1	O_2
VII.6	O_1	-	O_2

Notes:
O_1 = Pre-test
X_1 = Treatment by using total physical response
O_2 = Post-test

2. **Population and Sample**

In this research, the population is the seventh-grade students of SMPN 6 Cilegon in the academic year 2022/2023. The population consisted of 8 classes, namely; VII A, VII B, VII C, VII D, VII E, VII F, VII G, VII H. One class consists of 32 until 33 students. So the total population used is 262 students.
Purposive sampling was used by the researcher to select two classes from the population to serve as the

experimental and control groups. Purposive sampling was used by the researcher because it was one of the most effective and time-efficient sampling methods available. Two classes were used as samples in this study. The first class was VII C, with 33 students serving as an experimental group, and the second class was VII F, with 33 students serving as a control group. The sample size was 66 students.

3. The Technique of Data Collection

The data of this study used students' vocabulary mastery related to nouns and verbs before and after treatment. The researcher used the test as the instrument.

a. Pre-test

Pre-test is provided at the start of class (researcher gives pre-test to perform an experiment) to determine students' understanding of content to be considered. The result calculation of vocabulary test (Pre-test) in his part:

Table 1
The Result Calculation of Pre-Test

No.	Name	Score
1	ACI	62
2	AS	73
3	AR	94
4	ANS	65
5	APS	100
6	AMVJ	51
7	AW	62
8	ASN	42
9	BA	94
10	DNA	74
11	DMY	80
12	EMS	40
13	FLH	91
14	FNP	51
15	FHH	40
16	IM	88
17	JA	85
18	KDM	94
19	KA	80
20	LMK	80
21	MA	91
22	MG	71
23	MNM	54
24	MRS	85
25	MSA	74
26	NA	62
27	RL	80
28	RS	68
29	RK	88
30	SY	74

31	SM	91
32	SPE	62
33	VPH	85
Total		2431
Score Minimum		40
Score Maximum		100

a) Treatment

Treatment gave to the students as an exercise to determine vocabulary mastery. The treatment was conducted in the class for two meetings to the experimental group. The studens were given the same activities for the first and second meetings, but the vocabularies were different. The steps of total physical response method as follows:

1. The researcher introduced the material to the class.
2. The researcher gave explanation about part of speech, especially noun, verb, and adjective.
3. The researcher gave a review to the students, namely a warm-up where students were given orders or commands using vocabulary that students already knew or learned.
4. The researcher gave a new commands to the students, using *There is / There are, be, and adjective*.
5. The researcher and the students did a role reversal.
6. The researcher wrote the vocabulary on the whiteboard and the researcher read the vocabulary. The the students listened it and wrote the vocabulary on writing book

b. Post-test
Post-test provides at the end of the study and aims to measure students' vocabulary after treatment.

4. The Technique of Data Analysis

The researcher processes and analyzes the data. The researcher used scoring the students' correct answer pre-test and post-test, classifying the score of the students' pre-test and post-test, computing the frequency and the rate percentage of the students' scores, calculating the mean score of the students, non-parametric test (Wilcoxon test), and size effect.

RESULTS AND DISCUSSION

1. Results

The researcher used pre-test in experimental class to identify the students' vocabulary ability before the application of total physical response method. It showed that the total score of pre-test is 2431. The highest score of pre-test is 100, while the lowest score is 40. Students' vocabulary ability before the application of the total physical response method was still low, in experimental class by using total physical response there were 17 students who still got a pre-test score below the Minimum Completeness Criteria (Score 75).

The researcher know the effect on mastering students' vocabulary. The data presented as follows:

Table 2. Mean Score and Standard Deviation

Group	Mean Score		Standard Deviation	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Total Physical Response Method (Experimental)	73.67	83.73	16.89	13.35
Discovery Learning Method (Control)	75.76	80.70	18.24	19.10

The data in the table, shows that the students' mean score of pre-test in total physical response (experimental group) was 73.67, while the students' mean score of post-test in total physical response was 83.73, and the standard deviation of pre-test in total physical response was 16.89, while the standard deviation of post-test in total physical response was 13.35. In discovery learning Method (control group), the students' mean score of pre-test was 75.76, while students' mean score of post-test in discovery learning method was 80.70 and the standard

deviation of pre-test in discovery learning method was 18.24, while the standard deviation of post-test in discovery learning method was 19.10.

Table 3 Test of Normality

| | Shapiro-Wilk | | |
	Statistic	Df	Sig.
Post-Test Experiment	.922	33	.021
Post-Test Control	.813	33	.000

The data in the table, on Shapiro-Wilk test, the post-test using the total physical response method has a sig of $0.021 < 0.05$, then the data distribution is not normal. While the post-test using the discovery learning method has a sig of $0.000 < 0.05$, then the data distribution is not normal.

Table 4 Test of Homogenity

No.	X_1	X_2	X_1^1	X_2^2
1.	85	62	7225	3844
2.	97	80	9409	6400
3.	97	91	9409	8281
4.	94	91	8836	8281
5.	100	82	10000	6724
6.	82	100	6724	10000
7.	62	37	3844	1369
8.	51	80	2601	6400
9.	100	94	10000	8836
10.	94	54	8836	2916
11.	97	20	9409	400
12.	77	71	5929	5041
13.	85	85	7225	7225
14.	74	97	5476	9409
15.	82	97	6724	9409
16.	91	45	8281	2025
17.	80	88	6400	7744
18.	100	57	10000	3249
19.	85	77	7225	5929
20.	80	94	6400	8836
21.	100	97	10000	9409
22.	65	94	4225	8836
23.	68	80	4624	6400
24.	97	91	9409	8281
25.	80	91	6400	8281
26.	65	85	4225	7225
27.	88	74	7744	5476
28.	80	100	6400	10000

29.	91	88	8281	7744
30.	80	94	6400	8836
31.	97	88	9409	7744
32.	57	88	3249	7744
33.	82	91	6724	8281
Total	2763	2663	237043	226575
Mean	83.7273	80.697		

$$S_1{}^2 = \frac{n \sum X_1{}^2 - (X_1)^2}{n1 \cdot (n-1)}$$

$$S_1{}^2 = \frac{33 \cdot 237043 - (2763)^2}{33 \cdot (33-1)}$$

$$S_1{}^2 = \frac{7822419 - 7634169}{1056}$$

$$S_1{}^2 = \frac{188250}{1056}$$

$$S_1{}^2 = 178.267$$

$$S_2{}^2 = \frac{n \sum X_2{}^2 - (\sum X_2)^2}{n1 \cdot (n-1)}$$

$$S_2{}^2 = \frac{33 \cdot 226575 - (2663)^2}{33 \cdot (33-1)}$$

$$S_2{}^2 = \frac{7476575 - 7091569}{1056}$$

$$S_2{}^2 = \frac{385006}{1056}$$

$$S_2{}^2 = 364.589$$

$$F \text{ hitung} = \frac{varian\ besar}{varian\ kecil}$$

$$F \text{ hitung} = \frac{178.267}{364.589} = 0.4889$$

F_{tabel} for sig $\alpha = 0.05 \text{ dk}^1 = 33 - 1 = 32; \text{dk}_2 = 33 - 1 = 32$
F_{tabel} 0.05 from 32, 32 = 1.804
$F_{hitung} = 0.4889 < 1.804$, then the data is homogen.

Table 5 Wilcoxon Test

	Post-Test Experiment-Pre-Test Experiment	Post-Test Control-Pre-Test Control
Z	-3.948-[b]	-2.124-[b]
Asymp. Sig. (2-tailed)	.000	.034

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks

This research uses the Wilcoxon test, because the data is not normally distributed. To see the significance from Wilcoxon test, the researcher test the following hypothesis: If value significance smaller than zero point zero and

five (< 0.05), then null hypothesis (H$_o$) rejected and alternative hypothesis (H$_a$) accepted. If value significance bigger than zero point zero and five (> 0.05), then null hypothesis (H$_o$) accepted and alternative hypothesis (H$_a$) rejected. From the table, in experiment group has sig zero point zero zero and zero smaller than zero point zero and five (0.000 < 0.05) and in control group has sig zero point zero and thirty four smaller than zero point zero and five (0.034 < 0.05). It can be concluded that the null hypothesis (H$_o$) was rejected and alternative hypothesis (H$_a$) was accepted. To determine the effect of total physical response and discovery learning method with learning outcomes. Then use the size effect or the coefficient of determination. Based on the result of effect size is one thousand eighty hundrend and six (1.806) is large effect size, because the formula is (r² > 0.8).

Discussion

The students' vocabulary ability before the application of the total physical response method was still low, in experimental class by using total physical response there were 17 students who still got a pre-test score below the Minimum Completeness Criteria (Score 75).

There is a significant difference between students who are taught using the total physical response method and students who are taught using the discovery learning method in mastering students' vocabulary.

a. The statement was significance value 0.034 < 0.05. It means that the null hypothesis (H$_o$) was rejected and alternative hypothesis (H$_a$) was accepted. It is proved by the mean score based on pre-test and post-test in experimental group and control group.

b. When using total physical response the students' in pre-test mean score it was 73.67 and the students' in post-test mean score it was 83.73. It means that the students' vocabulary mastery had improved.

c. While using discovery learning method, the students' in pre-test mean score it was 75.76 and the students' in post-test mean score it was 80.70. It means that the students' vocabulary mastery had improved.

d.   It was founded that the mean score of total physical response (experimental group) was 83.73 and the mean score of discovery learning method (control group) was 80.70 after treatment both.

Based on the results of the research, this research supports the research of Khakim and Anwar, that the total physical response method can help students to learn English easily. Based on the results of the pre-test and post-test that the average value of the experimental class is greater than the control class. This shows that after getting treatment, the experimental class is better than the control class. So it can be concluded that students who receive treatment with the total physical response method get a higher score, and show that teaching English using the total physical response method can improve students' vocabulary mastery. (Khakim & Anwar, 2020)

There was any effect on mastering students' vocabulary after being taught using the total physical response and discovery learning methods.

a. There was an increase in students' vocabulary mastery and an increase in the students' scores before and after treatment in the experimental group and control group.

b. In treatment process, by using total physical response students were more interested and they were enthusiastic and answered the researcher's questions and actively followed the orders given by the researcher. They pay enough attention to the researcher's explanation because there is no repetition in the explanation. They can respond with what the researcher ordered. Based on this research, it has successed in supporting the research conducted by Supriyatin and Argawati, the total physical response method is effective in learning vocabulary mastery, because the total physical response method uses body movements or the five senses, and there is coordination between speech and action. The learning process becomes unsaturated, students learn by observing and practicing an action. Students are very enthusiastic in the learning process, and the learning process feels fun, so that learning objectives can be achieved. (Supriyatin & Argawati, 2021)

In treatment process, by using the discovery learning method, students also become active in class, because they must look for material and understand the material themselves. But there are still some students who feel confused when they have to solve the problems they encounter during the learning process. Based on this research, it has successed in supporting the research conducted by Junizar, Sofyan, and Sudiyono, using the discovery learning method many students have difficulty in understanding a vocabulary, because by using the discovery learning method, when learning process in the classroom students are not presented with information or learning materials

directly, but students are required to manage the understanding of the information or learning materials independently.(Junizar et al., 2020)

CONCLUSION

Based on the research findings, it could be concluded that the vocabulary of class VII students of SMPN 6 Cilegon has not reached a minimum score of 75 based on Minimum Completeness Criteria, and after being given treatment value of students increased. In addition, it shows an increase in students' vocabulary skills after being given treatment using the total physical response method and discovery learning. Based on research in class VII SMPN 6 Cilegon, the researchers concluded that there were significant differences between students using the total physical response and discovery learning methods. Based on the results of the Wilcoxon test, the experimental group had a sig 0.000 <0.05 and the control group had a sig 0.034 <0.05. It can be concluded that the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. The results showed that the total physical response was more effective than the discovery learning method in mastering the vocabulary of junior high school students, especially in class VII SMPN 6 Cilegon.

Pedagogical implication for the teacher, the teacher also should be more creative and innovative to develop teaching method to create an interesting class situation and to mastering students vocabulary. Total physical response method can be applied in English teaching learning process, because it can be very fun and can make students enjoy it and students be active in the classroom. Pedagogical implication for the students, the students of SMPN 6 Cilegon should use their English vocabulary to communicate in daily life in order to keep the vocabulary in their mind. The students were motivated learning vocabulary through total physical response, because they feel very fun and can make students enjoy it and students be active in the classroom. Pedagogical implication for the next researcher, the next resarcher it is hoped to used and develop this method by adding the comparison of English vocabulary or using this method in other English learning such as speaking, listening, reading, and writing.

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