

The Effect of Word Attack Strategy on Student's Reading Comprehension

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ABSTRACT

This research aimed to provide empirical evidence of the impact of the Word Attack Strategy on students' achievement in reading descriptive texts, specifically among seventh-grade students at SMP Negeri I Teluk Mengkudu. The study was conducted as experimental research, with the population consisting of all seventh-grade students. The sample included 20 students in the experimental group and 19 students in the control group. Data was collected using a test as the primary instrument and analyzed using a t-test formula. The analysis revealed that the mean score of the experimental group was 94.25, while the control group had a mean score of 71.05. The findings indicate that the Word Attack Strategy had a significant effect on reading skills, as evidenced by the t-score (t_o) of 6.189, which was higher than the t-table (t_t) value of 1.687 at a significance level of 0.05. Therefore, the hypothesis (H_a) is accepted, demonstrating that the Word Attack Strategy is more effective and significant in improving reading skills compared to conventional methods.

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I. INTRODUCTION

English is the first spoken language in England in the Early Middle Ages, and currently, English is the language most commonly spoken throughout the world. English is a foreign language that is people often to communicate anywhere. English is also the language used formally and informally (Novitasari et al., 2020). It is understood that language is a means of communication and through language people may be expected to get to know and change information as well as to relate to each other, share experiences, and improve intellectual abilities. Gradually, English has become an international language. English is the language of the world because it is considered a relatively easy language to learn. English is the first spoken language in England in the Early Middle Ages, and currently, English is the language most commonly spoken throughout the world (Novitasari et al., 2022). Since English is spoken both as a native language and as a common international language in an international meeting conference practically in every important meeting. The English language has developed from an Anglo-Saxon base of common words: household words, parts of the body, common animals, natural elements, most pronouns, prepositions, conjunctions and auxiliary verbs (Hashemi & Aziznezhah, 2011).

Therefore, it is important for students to master English today. By being able to use English opportunities to be involved in any international matters are possible. Those who can use English well could well understand and be understood by most people in all over the world. could be overstated. It is regarded as a foreign language that everyone in the cosmos must learn. In senior high school, English language instruction and learning focuses on a variety of goals, including the ability to comprehend and produce spoken and written texts using four language skills: listening, speaking, reading, and writing; and the ability to comprehend and create a variety of short functional texts. Various researches shows that vocabulary acquisition is one of the most important needs of English language learners (Hashemi & Aziznezha., 2011).

One of the skills in a language mastery is reading. Learning new words is of significant importance for students (Hashemi & Aziznezha., 2011). Reading is one of the skills which are taught in teaching English at all levels of education. Reading is an active and dynamic process that requires the application of a variety of comprehension and knowledge about language and print. Prior knowledge and vocabulary are extremely important in reading skill because they are so closely related.

Reading is an attempt to be able to comprehend the meaning of the passage. Reading skills are the talents that relate to a person's ability to read and comprehend written language and texts, as well as to interpret and decode them. According to (Adamu, 2024), Reading skills have been the most essential aspect of human cognition associated with social, emotional, economic, and physical health because they affect all other academic achievements. Learning to read involves learning how one's writing system encodes one's language (Verhoeven et al., 2024). Exemplary reading abilities can be extremely advantageous when it comes to digesting and responding to written communications such as emails, messages, letters, and other types of written correspondence.

Studies have found positive correlations between students who read substantially and high academic performance (Chamba & Avila, 2021). In every reading activity, a variety of reading texts are faced by readers. There are different ways of understanding the meaning of each text. During reading, only a relatively narrow area of the visual field can be utilized for visual information extraction (Zhuang et al., 2023). Narrative texts, recounts, reports, descriptive texts, explanations, analytical, expositions, method, discussion, and news item texts are examples of these types of texts. As part of their literary study, students in high school, particularly in the tenth grade, should be taught how to read comprehension, particularly in descriptive texts. It has been well known that a descriptive text is a text that explains the characteristics of someone, something, or a particular location. Teachers must use a number of strategies to improve student reading skill while teaching descriptive text. This can be performed by assessing students reading skill and demonstrating different reading comprehension tactics for them.

One of the other ways to understand descriptive text effectively in teaching is The word attack Strategy. The word attack strategy is one of many strategies that can be utilized to improve students' reading skill. Word Attack, according to Ralph Bedell, is described as an individual's ability to use any one approach or combination of strategies to recognize and master the meaning of new words as the need arises. The word attack strategy helps students transcribe language from orthographic symbols (Harahap, 2024). Word attack skills/strategies refer to techniques that help students to deal with the unfamiliar word by using the available clues within it and in context (Elmasry &

Bashbeeshi, 2018). When students are unable to comprehend the text while reading, they use a Word Attack Strategy to convey the text's message.

A lower grammatical mastery of student is meant that he or she cannot understand the content, and have problems reading English are less interested in reading long texts, and students who have difficulty understanding and finding the meaning of the text. As a result, by using the Word Attack Strategy, students will be able to understand the reading's content with ease. The strategy chosen is a tool that readers can use to understand what they are thinking.

Therefore, referring to what has been observed in a class that the students of VII graders at SMP Negri I Teluk Mengkudu has a variety of reading problems, particularly in reading skill. For example, they have difficulties understanding long texts such as descriptive texts; they are confused to understand the text when reading because they found some unfamiliar words. In that way the students are less able to comprehend the reading's content or message. For example, due to a lack of vocabulary knowledge, students cannot answer questions that ask them to answer synonyms or word definitions from a given descriptive text, and students cannot define the main idea of a given descriptive text. All of this is related to a lack of student motivation to read. As a result, it is required that the appropriate strategy to address all these issues should be conducted to them. The usage of the word attack approach will be explored in this study to see if it has a statistically significant influence on students' reading skill success when they are taught using the strategy.

The research focused on the Effect of Word Attack Strategy on the students in reading comprehension of descriptive text. And the objectives of this study were:

1. To find out what the students' difficulties in reading comprehension of the descriptive text were.
2. To analyze if there were the significant effects of the Word Attack Strategy on the student's comprehension.
3. To describe how the Word Attack Strategy affected significantly to the student's reading comprehension.

II. METHODS

This point discusses the research design, research procedure, technique of data analysis in completing the research paper. The description of the course of research should be supported references, so the explanation can be accepted scientifically. The population studied in this study is students in class VII SMP Negri I Teluk Mengkudu for the 2023-2024 Academic Year which consisted of five classes with the following characteristics:

Table. Population of Class VII Students at SMP Negri I Teluk Mengkudu

No	CLASS	POPULATION
1	11	19 Students
2	12	20 Students
3	13	19 Students
4	14	25 Students
5	15	23 Students
Total		106 Students

Sample

The sampling procedure will be used to determine the sample. Therefore, in identifying the sample to be used as a research subject, good research must pay attention to and use a technique. Simple random sampling is used for the purpose of sampling (Simple Random Sampling). As stated by (Noor et al., 2022), Simple random sampling is a widely utilized sampling method in quantitative studies with survey instruments. Each element of the entire population has an equal chance of being selected, which is the most distinguishing feature of this sampling technique. What to do if you win the lottery. Based on the lottery technique, two classes will be selected from five classes totaling 20 students from class VII 1 to serve as the Experimental group, and two classes will be selected from class VII 2 and VII 3 to serve as the Controlled group, totaling 20 students.

Research Design

This research used Quantitative research. As mentioned by (Ghanad, 2023), Quantitative research aims to quantify the data and generalize findings from a sample of a study from varied perspectives. The experimental method was carried out to obtain the average data. In conducting experimental research, the samples will be divided into groups, experimental groups and controlled groups. The experimental group was taught using a word attack strategy and the control group will be taught conventionally. Both groups will be then given pre-test and post-test. The design is as follows:

Table Research Design

Group	Type	Treatment	Type
Experiential	Pre-Test	VII 1	Post-Test
Controlled group	Pre-test	VII 2, VII 3	Post-test

Where: VIII: Using Word Attack Strategy and VII 2, VII 3: Using Conventional method

Operational Definition of Research

According to Sugiyono in (Korry, 2017) "The operational definition of research variables is an attribute or nature or value of objects or activities that have certain variations that have been determined by researchers to be studied and then drawn conclusions". In this study, the effect of the word attack strategy is related to the ability to read descriptive text which is one of the competency standards contained in the learning syllabus.

Thus, this research consisted of two variables, namely reading descriptive Text as the dependent variable and the word attack strategy as the independent variable. descriptive text is a text that contains a description of an object, either a living being, an object, a place, or an event in detail, so that the reader seems to see, feel, or experience himself, while the word attack strategy was a strategy that could help students decode, pronounce, or understand unfamiliar words while reading.

Instrument of the Research

In this research, the research used quantitative research, in which the research used 3 tests, namely pre-test, treatment, and post-test. The research instrument is a test. The test consisted of 20 multiple-choice questions about descriptive texts which will be tested on 39 students in different classes. The instrument used for pre-test and post-test. The research instrument that will be used in this study is an English test given to students to determine their ability to read descriptive texts. The test is in the form of multiple choice.

This research used four aspects of reading comprehension. These were determining of main idea, making inferences, detailed information, and understanding of vocabulary. To get the score from students' reading test used the formula:

$$\text{Score} = \frac{\text{Student's Correct Answer}}{\text{Total Number of Item}} \times 100$$

The research use Brown standard in reading Comprehend. There are Excellent, Good, Average, and Fair level. Meanwhile, the students' level been see the table below:

Table. Standard in Reading Comprehend

Score	Level Mastery
90-100	Excellent
70-89	Good
50-59	Average
30-49	Fair

Validity of the Test

The instrument's high and low validity indicates the amount to which the data collected does not stray from the intended validity description.

The Formula is:

$$r_{xy} = \frac{N \sum XY - (\sum x) (\sum Y)}{\sqrt{\{n \sum x^2 - (\sum x)^2\} \{n \sum y^2 - (\sum y)^2\}}}$$

Reliability of the Test

If the data is accurate, it will remain the same no matter how many times it is collected. The term "reliability" relates to the degree to which something may be trusted.

The formula is:

$$r_{11} = \frac{2 \cdot r_{1/21/2}}{1 + r_{1/21/2}}$$

Where :

r_{11} : The reliability
 $r_{1/21/2}$: The coefficient between the two tests

To obtain test reliability, the mean (M) and standard deviation (SD) must first be calculated. The value of the reliability as the following: 0,30 – 0,49 : the liability is very low : 0,40 – 0,59 : the reliability is low 0,60 – 0,79 : the reliability is fair 0,70 – 0,89 : the reliability is high 0,90 – 1,00 : the reliability is very high.

In this context, the technique for gathering data is called a test. Multiple choice questions are used in this type of test. The test is used to compare the students' reading abilities before and after the test. The research utilized a multiple-choice procedure with

a total of 20 items in the pre-test. The multiple-choice technique is a technique that is designed to give the participant four choices from which he or she must select the one that is accurate.

Pre-Test

Pre-test was given to obtain students' score in reading comprehension before applying the treatment (Mariana, 2020). The experimental group will be taught using the Word Attack Strategy, whereas the control group will be taught using the standard method (which will not be used in the experiment). Both groups will be given the same reading material to complete.

Post-Test

The post-tests are used to get the mean score for both the experimental and the control groups. A post-treatment test is one that is performed after the treatment has been completed. Following an explanation of the topic, both groups are given the same test to determine the mean scores of the control group and experimental group respectively. The test, which co-teacher. The test was identical to the test, the students returned it to the items, and were distributed in every way. After completing the possession. The research utilized a multiple choice procedure with a total of 20 items in the pre-test. The multiple-choice technique is a technique that is designed to give the participant four choices from which he or she must select the one that is accurate.

III. RESULT AND DISCUSSION

The data was collected by administering the test provided to the students. It was collected by analyzing the result of sample's reading comprehension test. The data was divided into two groups, they were experimental and controlled group. Both experimental and control group were given in a way of reading comprehension test as in the pre-test and post- test which was by using Word Attack strategy. It was shown from the data collected that the data in the controlled group showed the lowest score of pre-test was 60 and the highest score was 75. And it was shown from the data of the post-test that the lowest score was 70 and the highest was 85. Meanwhile the datashowed in experimental group was the lowest score of pre-test was 65 and the highest score was 75. And data in the post-test showed that the lowest score was 80 and the highest was 90.

In experimental group was obtained that the lowest score when pre-test was 65 and the highest score was 75. There are 9 students who was got score 65. And 8 students who was got score 75. For post- test, the lowest score was 80 and the highest score was 90. There are 16 students who was got score 80. And 5 students who was got score 90.

It can be identifying the score in pre-test and post-test in control group with rubrics of scoring speaking test in this table:

Aspect	Score Pre-Test	Score Post-Test
Content	12	13
Vocabulary	15	17
Comprehension	14	16
Fluency	15	17
Pronunciation	19	22
Total Score	75	85

The Mean Score in pre-test and post-test

$$X_1 = \frac{\sum X_1}{nx} = \frac{2020}{30} = 67$$

$$X_2 = \frac{\sum X_2}{nx} = \frac{2310}{30} = 77$$

The mean of control group

$$Ma = \frac{\sum d}{Na}$$

$$Ma = \frac{295}{30}$$

$$Ma = 9.8$$

Standard deviation

$$d^2 = \sum da^2 - \left[\frac{(\sum d)^2}{n} \right]$$

$$d^2 = 3175 - \left[\frac{(295)^2}{30} \right]$$

$$d^2 = \frac{870}{30}$$

$$= \frac{29}{10}$$

$$= 2.9$$

$$d^2 = 3175 - 2900$$

$$d^2 = 275$$

Where d is the difference scores pre-test and post-test and d2 is the standard deviation in the control class.

The Differences Scores Pre-Test and Post-Test in Experimental Group

No	Students Initial	T ₁	T ₂	d	d ₂
1	AAP	70	80	10	100
2	ADC	70	80	10	100
3	ANP	70	85	15	225
4	AS	75	90	15	225
5	BK	65	80	15	225
6	BAP	70	85	15	225

7	CHS	75	80	5	25
8	CN	65	80	15	225
9	DAL	70	85	15	225
10	DYA	65	80	15	225
11	GA	70	85	15	225
12	GSP	75	90	15	225
13	HM	70	80	10	100
14	HMG	65	80	15	225
15	IC	75	85	10	100
16	IKP	65	80	15	225
17	KA	65	80	15	225
18	LG	75	85	10	100
19	MAL	70	90	20	400
20	MBP	70	80	10	100
21	MZ	65	80	15	225
22	NA	65	85	20	400
23	NAL	75	85	10	100
24	RA	75	90	15	225
25	RAS	70	80	10	100
26	SUL	70	85	15	225
27	WP	65	80	15	225
28	WZN	70	80	10	100
29	ZM	75	90	15	225
30	ZYL	70	80	10	100
	Total	2095	2495	400	5650

Based on the data above, it can be identifying the score in the pre-test and post-test in the experimental group with rubrics of scoring Reading test in this table:

Aspect	Score Pre-Test	Score Post-Test
Content	12	14
Vocabulary	15	18
Comprehension	13	17
Fluency	16	18
Pronunciation	19	23
Total Score	75	90

Testing the Hypothesis

The Calculation Table to Find the “ t_0 ”

No	X	Y	$x = (X - M_x)$	$y = (Y - M_y)$	x^2	y^2
1	10	10	0.2	-3.3	0.04	10.89
2	15	10	5.2	-3.3	27.04	10.89
3	5	15	-4.8	1.7	23.04	2.89
4	10	15	0.2	1.7	0.04	2.89
5	10	15	0.2	1.7	0.04	2.89
6	10	15	0.2	1.7	0.04	2.89

7	10	5	0.2	-8.3	0.04	68.89
8	10	15	0.2	1.7	0.04	2.89
9	10	15	0.2	1.7	0.04	2.89
10	15	15	5.2	1.7	27.04	2.89
11	5	15	-4.8	1.7	23.04	2.89
12	10	15	0.2	1.7	0.04	2.89
13	15	10	5.2	-3.3	27.04	10.89
14	5	15	-4.8	1.7	23.04	2.89
15	10	10	0.2	-3.3	0.04	10.89
16	15	15	5.2	1.7	27.04	2.89
17	10	15	0.2	1.7	0.04	2.89
18	5	10	-4.8	-3.3	23.04	10.89
19	5	20	-4.8	6.7	23.04	44.89
20	10	10	0.2	-3.3	0.04	10.89
21	15	15	5.2	1.7	27.04	2.89
22	10	20	0.2	6.7	0.04	44.89
23	10	10	0.2	-3.3	0.04	10.89
24	5	15	-4.8	1.7	23.04	2.89
25	10	10	0.2	-3.3	0.04	10.89
26	10	15	0.2	1.7	0.04	2.89
27	10	15	0.2	1.7	0.04	2.89
28	10	10	0.2	-3.3	0.04	10.89
29	10	15	0.2	1.7	0.04	2.89
30	10	10	0.2	-3.3	0.04	10.89
TOTAL					274.2	316

$$\sqrt{\frac{274.2}{30}} \quad \sqrt{9.14}$$

$$SD_y = \sqrt{\frac{\sum y^2}{n}} = \sqrt{\frac{316}{30}} = \sqrt{10.53} = 3.24$$

$$SE_{my} = \frac{3.24}{\sqrt{n-1}} = \frac{3.24}{\sqrt{30-1}} = \frac{3.24}{\sqrt{29}}$$

$$\begin{aligned} SE_{mx - my} &= \sqrt{SE_{mx}^2} + \sqrt{SE_{my}^2} \\ &= \sqrt{0.56^2 + 0.602^2} = \sqrt{0.31 + 0.36} = \sqrt{0.67} = 0.81 \end{aligned}$$

In Testing Hypothesis, the data was showed the formula data from post-test in experimental and control group. And to knows if the hypothesis is accepted. In this research, the calculation of t-test showed that t-obs in the df 58 at the p level 0.05 is 4.41. While t-table in the df the p level 0.05 the critical value is 2.0016.

$$t\text{-obs} > T\text{-table} = 4.41 > 2.0016$$

From the result, it was showed "There is significance effect of Word Attack Strategy in Teaching Reading Comprehension".

IV. CONCLUSION AND SUGGESTION

After describing the reality of learning process in applying word attack strategy in reading comprehension of descriptive text, some conclusions can be drawn. As the result, the data was analyzed that word attack strategy gave some positive effects to the students in teaching reading comprehension skill, since it was 4.41. t-obs in the df 58 at the p level 0.05 is 4.41. While t-table in the df the p level 0.05 the critical value is 2.0016 and $t\text{-obs} > T\text{-table} = 4.41 > 2.0016$. By teaching English in the classroom using Word Attack Strategy enables students to get better understanding and comprehending reading text. Eventually this strategy gives significant effects to the student's achievement in reading comprehension. Observation conducted since this research was carried out indicated that students got barriers as well as some difficulties when they were faced to comprehend English text. The difficulties of the students are able to be overcome after implementing this word attack strategy.

Based on the conclusions above, some suggestions are stated as the following. The English teacher can apply Word Attack Strategy to teach Reading Comprehension in the classroom. By using the technique, the teacher can be more effective to convey the lesson materials to the students. Teachers can apply Word Attack Strategy that will help them in reading and comprehending the English descriptive text significantly. The teachers should be able to motivate the students to get to understanding and information when the students read a text especially Descriptive Text in the Reading Skills. This research is expected to be used used to teach reading (Descriptive Text) more effectively in learning process, because it allows the students to know and understand about the context in the text, and add their insight into vocabulary.

REFERENCES

- Adamu, C. E. (2024). The impacts of word attack strategies in improving students' reading skill: A sequential explanatory mixed methods study. *Bahir Dar Journal of Education*, 24 (2), 70-84, <https://dx.doi.org/10.4314/bdje.v24i2.5>
- Best, J. W., & Khan, J. V. (1993). *Research in Education*. United States of America, USA: Addison Wesley Longman, Inc.
- Chamba, M. Y., & Avila, M. R. R. (2021). Word Recognition and Reading Skills to Improve Reading Comprehension. *Journal of Foreign Language Teaching and Learning*, 6 (1), 20-36, <https://doi.org/10.18196/ftl.v6i1.10174>
- Elmasry, H. I. & Bashbeeshi, E. A. (2018). A WORD ATTACK SKILLS-BASED PROGRAM TO ENHANCE EFL SECONDARY SCHOOL STUDENTS' VOCABULARY LEARNING, READING COMPREHENSION AND SELF-

- EFFICACY. *EKB Journal Management System*, 103 (2), 3-25, https://journals.ekb.eg/article_178149.html
- Fraenkal, J.R. Wallen, N.E., & Hyun, H. H. (2012). *How to Design and Evaluate Research in Education*. New York, Guilford Press.
- Ghanad, A. (2023). An Overview of Quantitative Research Methods. *INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS*, 6 (8), 3794-3803, <http://dx.doi.org/10.47191/ijmra/v6-i8-52>
- Grabe William, & Fredricka, L. Stoller. (2002). *Teaching and Researching Reading*. (New York: Logman).
- Grellet, E. (1996). *Developing Reading, Skills. A Practice Guide to Reading Comprehension*. Cambridge University Press.
- Hashemi M & Aziznezhed M (2011). Etymology: a word attack strategy for learning the english vocabulary: *Procedia - Social and Behavioral Sciences*
- Harahap, F. R. (2024). Improving The Students' Reading Comprehension Through Word Attack Strategy. *Journal of Applied Linguistics (JoAL)*, 4 (1), 145- 150, <https://doi.org/10.52622/joal.v4i1.258>
- Ginting, P., Hasnah, Y., Saragih, M., & Kharisma, A. (2024). The Embodiment of Environmental Discourse in Language Learning: A Critical Ecolinguistic Study of EFL Textbooks in Indonesia. *جستارهای زبانی*, 15(1), 145-175.
- Hasnah, Y., Ginting, P., Supiatman, L., Kharisma, A. J., & Siahaan, H. S. (2024). How Do Locally Produced EFL Textbooks Endorse Critical Thinking Skills in Indonesia? A Content Analysis. *Journal of Language Teaching and Research*, 15(1), 190-200.
- Kharisma, A. J., Ginting, P., Hasnah, Y., & Utomo, M. I. (2023). LINGUISTIC LANDSCAPE PORTRAYED IN INDONESIAN EFL TEXTBOOKS: A DESCRIPTIVE STUDY. *Jurnal As-Salam*, 7(2), 195-214.
- Mariana, (2020). IMPROVING STUDENTS' READING COMPREHENSION OF VIII GRADE AT SMK NEGERI 1 TULIN ONSOI THROUGH RETELLING STORY. *JME*, 6 (1), 26-31, <https://ojs.umada.ac.id/index.php/jme/article/download/113/108>
- Murcia Mariannes, C. (2001). *Teaching English as a second or foreign language*, Third Edition. USA: Thomson Learning, Inc.
- Noor, S., Tajik, O., & Golzar, J. (2022). Simple Random Sampling. *International Journal of Education & Language Studies*, 1 (2), 78-83, <https://doi.org/10.22034/ijels.2022.162982>
- Novitasari, H., Saputri, K., Hartati, S., & Saraswaty, D. R. (2021). THE INFLUENCE OF WORD ATTACK STRATEGY TOWARD THE STUDENTS READING COMPREHENSION ACHIEVEMENT OF THE SEVENTH GRADE STUDENTS AT SMP NEGERI 1 PRABUMULIH. *English Community Journal*, 5 (2), 130-136, <https://doi.org/10.32502/ecj.v5i2.4241>
- Pardiyono, (2007). *Pasti Bisa: Teaching Genre-Based Writing*. Yogyakarta: Penerbit Andi.

- Rahmayana, R., Kharisma, A. J., & Alamsyah, B. N. (2024). Investigating Motivational Factors and Strategies for Learning English as a Foreign Language (EFL) among Adult Learners: A Case Study of Indonesian EFL Learners. *Journal of English Language and Education*, 9(4), 175-186.
- Syahri, I. Sulaiman, M., & Susanti, R. (2017). *Metodologi Penelitian Pendidikan Bahasa*. Palembang: Roemah Sufie
- Verhoeven L., Voeten M., Segers E., (2024). Computer-assisted word reading intervention effects throughout the primary grades: A meta-analysis: *Educational Research Review*
- Zhuang Z., Liang Z., Rao Y., Xie H., Wang F.L., (2023). Out-of-vocabulary word embedding learning based on reading comprehension mechanism: *Natural Language Processing Journal*