

CHAPTER III

RESEARCH METHODOLOGY

A. Research Design

This research employed a pre-experimental design, specifically the one group pretest-posttest design. According to Creswell (2018), a pre-experimental design is a type of experimental design in which the researcher has limited control over the assignment of participants and typically involves only one group that is measured before and after a treatment. In line with this definition, this research involved a single group of students who were given a pretest prior to the treatment and a posttest after the implementation of Wordwall as a learning medium.

B. Research Variable

Research variables are everything that researchers decide to obtain information and draw conclusions. There were two variables in this research, namely the independent variable and the dependent variable.

1. Independent variable (X)

According to Creswell (2018), independent variables are those that influence, or affect outcomes in experimental studies. In this research, the independent variable is the use of Wordwall.

3. Dependent variable (Y)

According to Creswell (2018), dependent variables are those that depend on the independent variables; they are the outcomes or

results of the influence of the independent variables. The dependent variable in this research is students reading comprehension.

C. Research Setting

The research setting of this research was SMPN 10 Padang. This research was conducted during the 2025/2026 academic year, specifically from July to August, and lasted for approximately one month. The study was carried out in regular English classroom sessions as part of the school's normal teaching and learning activities. The participants involved in this research were eighth-grade students of SMPN 10 Padang. The learning process took place under normal classroom conditions, and no special treatment was applied except for the instructional treatment related to the research.

D. Data and Source of the Data

The data of this research were quantitative data in the form of students' reading comprehension scores. These data were obtained through pretest and posttest administered before and after the implementation of Wordwall as a learning medium. The pretest scores reflected students' initial reading comprehension ability, while the posttest scores showed their performance after receiving the treatment. By comparing the results of both tests, the researcher was able to identify changes in students' reading comprehension.

The source of the data in this research was the eighth-grade students of SMPN 10 Padang in the 2025–2026 academic year. According to

Creswell (2018), a population refers to a group of individuals who share common characteristics and become the focus of the researcher's interest. In this research, the population consisted of all eighth-grade students at SMPN 10 Padang.

The sample of the research functioned as the primary source of the data. Creswell (2018) states that a sample is a subset of the population selected to represent the entire group. In this research, one class of eighth-grade students consisting of 32 students was selected as the sample.

A sampling technique was applied to select the sample from the population. Sampling is the process of choosing a subgroup from a larger population to participate in research (Creswell, 2018). This research employed cluster sampling, in which naturally formed groups such as classrooms are selected as the sampling units. One intact class was chosen because this technique is more practical for school-based research settings.

E. Research Instrument

The research instrument used in this research was a reading comprehension test. The test was designed in the form of multiple-choice questions to objectively measure students' reading comprehension ability. It consisted of 20 items, with four answer options for each question. The test was administered both as a pretest and a posttest to measure students' reading comprehension before and after the implementation of Wordwall. The time allocation for completing the test was 45 minutes, which was

considered sufficient for eighth-grade students to read and respond to the questions.

The reading comprehension test was developed based on the aspects of reading comprehension proposed by Nuttal (1982), including identifying the main idea, finding specific information, making inferences, understanding references, and interpreting vocabulary in context. In this research, the instrument covered four aspects, namely main idea, specific information, inference, and vocabulary, with each aspect represented by five questions. All reading texts and comprehension questions were adapted and modified from *Detik-Detik Ujian Nasional Bahasa Inggris SMP/MTs 2019/2020* to ensure their suitability for eighth-grade students. Therefore, the balanced distribution of items was intended to measure students' reading comprehension comprehensively and systematically.

Table 3. 1 Reading Comprehension Test Item Distribution

NO	Aspects	Number of Questions	Questions Number
1.	Main Idea	5 questions	1, 6, 9, 16, 19.
2.	Specific Information	5 questions	2, 10, 13, 17, 20.
3.	Inference	5 questions	3, 5, 7, 11, 14.
4.	Vocabulary	5 questions	4, 8, 12, 15, 18.

In terms of cognitive levels, the test items were classified into 12 items (60%) were categorized as LOTS, four items (20%) as MOTS, and four items (20%) as HOTS. This composition was designed to suit the cognitive development of eighth-grade students, who are generally still developing literal and inferential comprehension skills. Brookhart (2010)

argues that an excessive dominance of HOTS items may cause high cognitive load for students who are not conceptually ready. This view is supported by Cognitive Load Theory proposed by Sweller et al. (2011), which states that learning is most effective when instructional demands do not exceed students' working memory capacity.

Table 3. 2 Cognitive Level Distribution

NO	Category	Cognitive Level	Explanation	Number of Questions	Percentage	Questions Number
1.	LOTS	Remember, Understand	<i>Mengingat dan memahami informasi literal</i>	12 questions	60%	1, 4, 8, 10, 12, 13, 15, 16, 17, 18, 19, 20.
2.	MOTS	Apply	<i>Menggunakan informasi dalam konteks baru</i>	4 questions	20%	2, 5, 6, 9.
3.	HOTS	Analyze, Evaluate, Create	<i>Analisis, evaluasi, dan penciptaan gagasan baru</i>	4 questions	20%	3, 7, 11, 14.

Therefore, the composition of the test items was designed to remain academically challenging without imposing excessive cognitive demands on students. The combination of LOTS, MOTS, and HOTS questions was intended to support students' gradual development from literal comprehension to higher-level critical thinking skills. In addition, the variation of reading comprehension aspects encouraged students to actively interact with the text through different types of questions. This approach is in line with Day & Park (2005), who suggest that reading questions should engage learners in multiple ways to achieve deeper comprehension. Consequently, the research instrument was considered

appropriate to provide a comprehensive and balanced measurement of eighth-grade students' reading comprehension.

F. Data Collection Technique

The data collection technique in this quantitative research follows Gay et al. (2012) framework, which emphasizes systematic procedures such as defining the population and sample, preparing valid and reliable instruments, and administering pretests and posttest. This research uses a pretest-posttest design to measure students' reading comprehension before and after the intervention using Wordwall media. By adhering to this approach, the researcher ensures the data collection is valid, reliable, and suitable for the research objectives.

1. Research Implementation

The implementation of Wordwall in this research follows the instructional media procedure proposed by Azhar (2011), which consists of four main steps: preparation, presentation, student participation, and evaluation.

- a. Preparation. In this stage, the teacher prepares all necessary tools and materials, including the Wordwall.net account, internet connection, projector, and quiz content. The teacher also ensures that the Wordwall activity is aligned with the learning objectives and the students' reading level (A1).

- b. Presentation. The teacher introduces the media to students by explaining how the Wordwall game works and what the students are expected to do. The teacher gives clear instructions before starting the activity and displays the game through a projector since students are not allowed to use personal devices.
- c. Student Participation. Students actively engage in the activity. They are divided into small groups, take turns answering questions, and discuss possible answers before responding. The teacher facilitates the discussion and encourages students to use reading strategies while interacting with the content on Wordwall.
- d. Evaluation. After the activity, the teacher provides feedback and discusses the correct and incorrect answers. The teacher evaluates students' understanding based on their performance in the Wordwall activity and uses the results to reinforce concepts or clarify misconceptions.

2. Data Collection Procedure

The data collection procedure is carried out in three main stages according to the following schedule:

- a. Stage I – 1st meeting (Pre-test and Initial Implementation)

Students take the pre-test to assess their baseline reading comprehension. Afterward, the teacher introduces Wordwall

and begin its use in the classroom through interactive activities such as group sort, multiple-choice quizzes, and word association tasks. These activities aim to develop students' ability to identify main ideas, understand vocabulary in context, and make inferences.

b. Stage II – 2nd to 3rd meeting (Continued Implementation)

The second and third meetings continued the implementation of Wordwall, with the teacher integrating Wordwall into regular lessons. The focus was on reinforcing reading strategies through engaging and structured exercises using various game formats.

c. Stage III – 4th meeting (Post-test)

At the end of the treatment period, students took the post-test, which mirrors the pre-test in format and content to ensure consistency in measuring student progress.

The decision to conduct this research over four meetings, was based on the pre-experimental design that employed in this research. According to Gay et al. (2012), this design allows flexibility in determining the duration of the intervention, as long as the treatment structure remains controlled and the evaluation instruments are valid for measuring the intended outcomes. While no specific number of sessions is mandated, Gay et al. (2012) emphasize the importance of

providing an adequate dose of intervention to observe measurable effects.

Therefore, the researcher selected three treatment sessions to implement Wordwall media in a focused and continuous manner within the context of reading comprehension instruction. The inclusion of a pretest and posttest enable the researcher to compare students' initial and final abilities objectively, thus allowing a valid analysis of improvement. In addition to theoretical considerations, practical factors such as time constraints, school schedules, and administrative support, also inform the decision to design a realistic yet methodologically sound intervention.

G. Data Analysis Technique

The data analysis technique in this research used descriptive statistics. Pretest and posttest data were analyzed using Paired Sample t-Test with the help of SPSS software to ensure the accuracy of calculations and the validity of research results. The analysis steps are:

1. Normality Test

Use the Shapiro-Wilk Test to ensure whether the data is normally distributed. If $\text{Sig.} > 0.05$, then the data is normally distributed and the t test can be carried out. If $\text{Sig.} < 0.05$, then the Wilcoxon Signed Rank Test is used as a non-parametric alternative.

2. Paired Sample t-Test

If the data is normal, analysis is carried out by comparing the average of the pretest and posttest with formula: $t = \frac{D}{sD/\sqrt{n}}$

Information:

D = average difference in pretest and posttest scores

sD = standard deviation of the differences

n = number of sample

If $t \text{ count} > t \text{ table}$, then H_0 is rejected and H_1 is accepted, which means there is a significant difference between the pretest and posttest.

After the data analysis results were obtained, the researcher interpreted whether the use of Wordwall had a significant influence on students' reading comprehension. If the t test results show a p value < 0.05 , then the alternative hypothesis will be accepted, which means there is a significant difference between the pre-test and post-test scores, and the use of Wordwall has a positive effect on increasing reading comprehension. If the results show $p > 0.05$, then the null hypothesis is accepted, which means there is no significant difference between the pre-test and post-test scores, and the use of Wordwall does not have a significant effect on students' reading comprehension. Thus, this data analysis technique will provide a clear picture of how much influence the use of Wordwall has on the reading comprehension of grade 8 students at SMPN 10 Padang.