CHAPTER III
RESEARCH METHODOLOGY

A. Research Design

This study employed a quantitative approach, emphasizing the analysis of numerical data through statistical techniques to test hypotheses and examine relationships among variables. Quantitative research assumes that phenomena are objective and measurable, allowing systematic analysis to produce generalizable conclusions (Creswell, 2014).

This study uses a quasi-experimental research design, which is suitable when true experimental designs are difficult to implement in educational settings. According to Sugiyono (2019), quasi-experimental research involves manipulation of the independent variable without full randomization. This study adopted the Nonequivalent Control Group Design to examine the effect of the role-playing learning model on students' English learning outcomes, with student creativity as a moderating variable, enabling the identification of treatment effects despite limited control over external variables (Campbell & Stanley, 1963).

Table 3.1

Quasi-Experimental Design

Kreativitas	Model	
B	A1 (Role Playing)	A2 (Konvesional)
High Level (B1)	A_1 B_1	A_2 B_1
Low Level (B2)	A_1 B_2	A_2 B_2

Notes:

A = Learning Model

B = Creativity

B_1 = High Creativity

B_2 = Low Creativity

A_1 = Role Playing Model

A_2 = Conventional Method

B. Research Setting and Time

This study was conducted at Grade IX of SMP Negeri 05 Kota Bengkulu. The research period was from October 9, 2024, to November 18, 2024.

C. Research Population and Sample

1. Population

Population refers to a group of individuals who possess specific characteristics determined by the researcher for the purpose of analysis and conclusion drawing (Sugiyono, 2019). In this study, the population consisted of a total of seven classes of ninth-grade students at Junior High School 05 Bengkulu City. Each class has a relatively similar number of students, with an average of 28

students per class, indicating that the population is relatively homogeneous in terms of class size and grade level.

Table 3.2

Population of the Study

No.	Class	Number of Students
1	IX A	28
2	IX B	28
3	IX C	28
4	IX D	28
5	IX E	28
6	IX F	28
7	IX G	28
	Total	196

Based on the table above, the population in this study consisted of 196 students. These students were taken from seven classes of ninth-grade students at SMP Negeri 05 Bengkulu City.

2. Sample

A sample is a part of the population that represents the same characteristics as the population. When the population is large, sampling is conducted to obtain valid and reliable data efficiently in terms of time and cost. This Research used Quasi Experiment Design Which needed

two classes one class for experiment and the other class for control it can be seen in the follow table Based on this principle, this study used the entire population as research subjects since the total number of participants is fewer than 100.

Table 3.3
Sample

No	Class	Sample
1	IX A (Control Class)	28
2	IX B (Experimental Class)	28
Total		56

D. Data Collection Techniques

In this study, the researcher employs several data collection methods, namely Pre-Test, Tratment, Post-Test.

1. Pre-Test

The pre-test was conducted before the treatment to measure students' initial English learning outcomes and to identify their level of creativity before the implementation of the role-playing learning model.

2. Treatment

The treatment was the implementation of the role-playing learning model in the teaching and learning process to

improve students' English learning outcomes based on their creativity.

3. **Post-Test**

The post-test was conducted after the treatment to measure students' English learning outcomes and to determine whether there was an influence of the role-playing learning model on students' achievement and creativity.

E. Research Instruments

The instrument used in this study was a speaking test task designed to measure students' creativity in speaking. Through this task, the researcher aimed to observe how students expressed their ideas orally, developed their responses, and used language creatively in different speaking situations. The test was intended to assess several aspects of speaking creativity, such as originality of ideas, fluency in expressing thoughts, flexibility in responding to topics, and the ability to elaborate ideas clearly and confidently.

F. Data Analysis Techniques

It involves identifying the characteristics and elements within a situation that are highly relevant to the problem being examined and then focusing on those aspects in detail. This persistence is carried out to gain a deep understanding and obtain comprehensive data. Such observational persistence is applied by the researcher throughout the research process.

1. Prerequisite Test

The prerequisite analysis tests used in this study include the normality test and the homogeneity test. The steps of the prerequisite testing in this study are as follows.

a. Normality Test

The normality test aims to determine whether the data distribution is normal or not. The normality test was conducted using the Kolmogorov–Smirnov statistical test with the assistance of SPSS Statistics software. The Shapiro–Wilk test has a higher level of accuracy than the Kolmogorov–Smirnov Z test when the number of data points or samples analyzed is less than 50 ($n < 50$). When the sample size is greater than 50 ($n > 50$), the accuracy of the Kolmogorov–Smirnov test is considered acceptable.

This study also applies the Chi-Square test (χ^2 calculated).

$$X^2 = \sum_{i-1}^{k} \frac{(fo-fe)^2}{fe}$$

1) If χ^2_calculated $\leq$ χ^2_table, then the data distribution is normal.

2) If χ^2_calculated > χ^2_table, then the data distribution is not normal.

b. Homogeneity Test

The homogeneity test was used to determine whether the data had equal variance or not. In this study, the homogeneity test was analyzed using Levene's Statistic

through SPSS software. If the significance value was greater than 0.05, the data were considered homogeneous. On the other hand, if the significance value was less than 0.05, the data were considered not homogeneous.

1) Calculating the largest variance and the smallest variance:

$$F_{hitung} = \frac{varians\ terbesar}{varians\ terkecil}$$

2) Testing Criteria:

a. If F_calculated > F_table, the data are not homogeneous.

b. If F_calculated ≤ F_table, the data are homogeneous.

2. Hypothesis Testing

Two-Way ANOVA for Correlated Samples is a comparative hypothesis testing method used for k samples (more than two samples) by measuring or grouping data based on two influencing factors arranged in rows and columns. The statistical test employed in this analysis is the F-test.

a. Two-Way ANOVA Calculation

1) Determining the Total Sum of Squares (SST)

Formula:

$$JKT = [(X_{111})^2 + (X_{121})^2 + (X_{131})^2 + \cdots + (X_{rjn})^2] - \frac{(X_T)2}{r.b.j}$$

r = kelompok, j = kolom, b = baris

2) Determining the Sum of Squares Between Rows (SSB)

$$JBK = \frac{(\sum Xr_1)^2+(\sum TXr_2)^2+\cdots+(\sum TXr_{kT})^2}{b.j} - \frac{(\sum X_T)^2}{r.b.j}$$

3) Determining the Degrees of Freedom Between Rows

Formula:

$$dk_B = b - 1$$

4) Determining the Mean Square Between Rows

Formula:

$$S^2_1 \frac{JBK}{dk_B}$$

Determining the Sum of Squares Between Columns (SSC)

Formula:

$$JKK = \frac{(\sum T_1)^2+(\sum T_2)^2+\cdots+(\sum Ti)^2}{b.j} - \frac{(\sum X_T)^2}{r.b.j}$$

5) Determining the Degrees of Freedom Between Columns

Formula:

$$dk_k = j - 1$$

6) Determining the Mean Square Between Columns

Formula:

$$S^2_{2\frac{JKK}{dk_{kn}}}$$

7) Determining the Sum of Squares for Interaction (SSBC)

Formula:

$$JKI = \frac{\sum_{b=1}^{n}\sum_{j=1}^{b}(T_{kn})^2}{b} - \frac{\sum_{j=1}^{n}(T_j)^2}{r.b} - \frac{\sum_{1-n}^{n}(TXr_k)^2}{b.j} + \frac{(X_T)^2}{r.b.j}$$

8) Determining the Degrees of Freedom for Interaction

Formula:

$$dk_1 = (b-1)\,(j-1)$$

9) Determining the Mean Square for Interaction

Formula:

$$S^2_3 = \frac{JKI}{dk_1}$$

10) Determining the Sum of Squares for Error (SSE)

Formula:

$$SSE = SST - SSB - SSI$$

11) Determining the Degrees of Freedom for Error

Formula:

$$dk_1 = (rj)\,(b-1)$$

12) Determining the Mean Square for Error

Formula:

$$S^2_3 = \frac{JKG}{dk_G}$$

13) Determining the F-Calculated Value

$$F_1 = \frac{S_1^2}{S_4^2}, F_2 = \frac{S_2^2}{S_4^2}, F_3 = \frac{S_1^2}{S_4^2}$$