CHAPTER III
METHODOLOGY

A. Type of Research

This research is a quantitative research, which is a scientific research approach that collects, analyzes, and interprets data quantitatively or in numerical form [28]. This approach focuses on gathering numerical data to understand the relationships between variables, identify patterns, and test hypotheses. Quantitative methods are used to measure phenomena, identify recurring patterns, and formulate generalizations that can be applied to a broader population.

In this quantitative research, the researcher employs an experimental design involving an experimental group that undergoes two measurement stages, they are a pre-test before the implementation of the treatment and a post-test after the treatment implement. This design allows the researcher to assess changes in the experimental group over time as a result of the given treatment.

B. Population and Sample

1. Sample of the Research

In quantitative research, the population refers to the entire group or category of individuals, elements, or units with specific characteristics that are the focus of the research. The population includes all entities relevant to the research question and the research objectives. On the other hand, a sample is a subset or a small portion of the population selected for observation or measurement in the research context. Sample selection is done to represent the characteristics of the population more efficiently and practically. By using a sample, researcher can make generalizations to the entire population[29]. The population and sample in this research refer to male and female students in an 8th-grade class at a Madrasah Tsanawiyah (MTs). The characteristics of this population are focused on students undergoing education at a specific grade and semester level, namely 8th-grade students in the second semester. Students at this educational level would receive Grammar material, specifically present and past tenses, making them suitable subjects for this research. The sample is selected from

[28] Dr Sujarwo Et Al., "DASAR-DASAR PENELITIAN KUANTITATIF," N.D.

[29] Sujarwo Et Al., "Dasar-Dasar Penelitian Kuantitatif," N.D.

the population of 8th-grade students in the second semester at MTs. The sample size for this research is 60 students, that divide into 2 classes 30 students in experimental class and 30 students in control class. The selection of this number is also based on practical considerations, available resources, and to obtain a sufficiently representative sample from the 8th-grade second-semester population.

2. Sample Characteristics

Characteristics of the students (sample) in this research:

a. The sample consists of 8th-grade middle school students in the second semester.
b. The sample has a basic knowledge of the English language.
c. The sample includes both male and female students.

C. Variabel Identification

According to Moh. Nasir, in his book titled "Metodologi Penelitian," he explains that a variable is something that can vary and becomes the focus of scientific research. Variables can be independent, meaning they are the cause or trigger of change, and dependent, meaning they are the outcome or response to changes induced by independent variables[30]. This definition reflects the fundamental understanding of variables in the context of science and research, where researchers identify and measure variables to understand the relationships and effects among the phenomena under investigation

Based on the title "THE EFFECTIVENESS OF COMIC STRIPS TOWARDS STUDENTS' GRAMMAR (PRESENT AND PAST TENSE) MASTERY FOR EIGHT GRADE OF ISLAMIC JUNIOR HIGH SCHOOL IN KUDUS," the researcher identifies several variables involved in this research. Identifying these variables can assist in formulating hypotheses and research design. Here are some variables present in this research:

1. Independent Variable (X)

Use of Comic Strips, This variable may be the primary focus as the method or treatment given to the experimental group.

2. Dependent Variable (Y)

Students' Grammar Mastery: This variable will be influenced by the independent variable because it depends

[30] Moh. Nazir, *Metode Penelitian*, Vol. 6 (Bogor: Ghalia Indonesia, 2005), Https://Pustaka.Unm.Ac.Id/Opac/Detail-Opac?Id=38633.

on the effectiveness of using comic strips for learning grammar (Present and Past Tense).

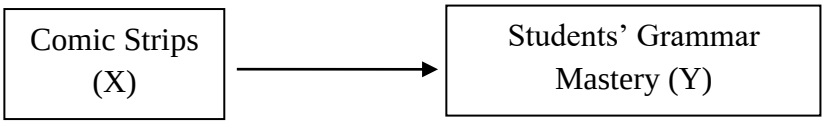

Figure 3.1. Comic Strips (X) Influence Students' Grammar Mastery (Present and Past Tense) (Y)

By identifying these variables, the research can be designed to measure the impact of the effectiveness of using comic strips on students' mastery of grammar in the context of present and past tenses.

D. Operational Variables

According to Priadanan and Sunarsih, operational definition is the specification of the researcher's activities in measuring or manipulating a variable[31]. This operational definition explains that there will be limitations or meanings to variables by detailing what the researcher must do for the measurement of the specified research variable.

Based on the title "THE EFFECTIVENESS OF COMIC STRIPS TOWARDS STUDENTS' GRAMMAR (PRESENT AND PAST TENSE) MASTERY FOR EIGHT GRADE OF ISLAMIC JUNIOR HIGH SCHOOL IN KUDUS" the researcher details these variables into operational variables, which encompass the measurement methods of these variables. The following are the operational variables related to this research:

1. Independent Variable (X)
   Use of Comic Strips, This variable can be measured by determining the frequency of implementing comic strips in the learning process. In this research, it will be implemented for a total of 2 sessions.
2. Dependent Variable (Y)
   Students' Grammar Mastery (Present and Past Tense), this variable can be operationalized through written or oral tests that include questions testing students' understanding of present

[31] Sidik Priadana, M.S. And Denok Sunarsi, Cht, *Metode Penelitian Kuantitatif*, Vol. 1 (Cipayung, Kec. Ciputat, Kota Tangerang Selatan Tangerang Selatan: Pascal Books, 2021), Https://Lemlit.Unpas.Ac.Id/Wp-Content/Uploads/2022/02/Metode-Penelitian-Kuantitatif.Pdf.

tense in grammar. In this research, there will be a Pre-test and Post-test to observe the impact on the students' development.

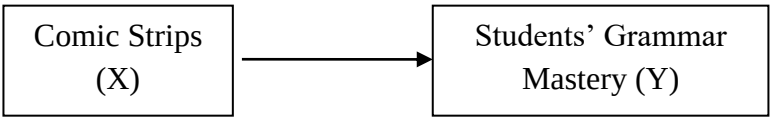

Figure 3.2. Comic Strips (X) Influence Students' Grammar Mastery (Present and Past Tense) (Y)

By operationalizing these variables, the research can be conducted in a measurable manner and can be repeated to test the effectiveness of comic strips on students' mastery of grammar.

E. Data Collection Techniques

Data collection techniques in a study are very important, because the aim in research is to get data that suits the needs in research with predetermined standards [32]. Without knowing the data collection technique, the researcher will not get data that meets the established standards. In this study there were 2 data collection methods, namely anket and tests (pre-test and post-test).

1. Inquiry
   Questionnaire is a list of statements or questions about a particular topic given to the subject to obtain certain information [33]. Questionnaire is used to collect data on research activities. The indicator contained in the questionnaire of the effectiveness of comic strips as media in the learning process[34]:
   a. Efficiency, effective learning media enables teachers to integrate various learning components, including objectives, methods, materials, and evaluation, to deliver within the designated time frame.
   b. Effectiveness, Effective learning media enables teachers to measure the efficiency of learning through evaluation and measurement of learning outcomes.

[32] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, Dan Rnd*, 1st Ed. (Bandung: Penerbit Alfabeta, 2014).

[33] Rachmawati Et Al., *Metodologi Penelitian* (Makassar: Cendekia Publisher, 2022).

[34] Nia Rismawati Et Al., "Efektivitas E-Learning Sebagai Media Pembelajaran Pada Mata Kuliah Bahasa Inggris Di Politeknik Negeri Jakarta," *Jurnal Pendidikan Dan Kebudayaan (JURDIKBUD)* 2, No. 3 (November 15, 2022): 278–85, Https://Doi.Org/10.55606/Jurdikbud.V2i3.690.

2. Test

   A test is a form of question, which is asked by the teacher to his students before and after the learning process. The question asked is the material to be taught [35]. Tests can also be interpreted as activities to test levels of knowledge. The indicators contained in the test:

   a. Understanding the context of the sentence
   b. Identify sentence structure according to grammar

F. Data Analysis

After the data is collected, the next step is data analysis. Data must be selected properly so that the data obtained is valid. Data analysis is the process of systematically searching and compiling data obtained from the results of the media practicability questionnaire and analysis of pre-test and post-test results. The analysis techniques used in this study are:

1. The Effectiveness of Media

   The effectiveness of the media is assessed based on the results of the questionnaire analysis given to class VIII students. The questioner would use Likert scale, a likert scale consists of several items designed to measure a concept or variable. Each item has several answer options in the form of a numerical scale, such as a scale of 1-5, 1-7, or 1-9 and this questioner would use 1 to 5. Respondents are asked to indicate the extent to which they agree or disagree with the statements provided for each item, with higher numbers indicating higher levels of agreement [36]. The media is said to be effective if the effectiveness assessment meets the criteria.

$$\text{Effectiveness} = \frac{\text{Score obtained}}{\text{Number of statement items}}$$

After the effectiveness is seen, the average is sought and classified according to its effectiveness.

$$\text{Average Effectiveness} = \frac{\text{Total effectiveness of all students}}{\text{Number of students}}$$

[35] Rachmawati Et Al., *METODOLOGI PENELITIAN* (Makassar: Cendekia Publisher, 2022).

[36] Yusuf, Ani Mulyanti, "Pengembangan Instrumen Menggunakan Metode Likert Skala," *Jurnal Penelitian Dan Evaluasi Pendidikan*, 1, 13 (2009).

Table. 3.1. Effectiveness Criteria

Validity (X)	Category
1,00 < Y ≤ 1,99	Not Effective
1,99 < Y ≤ 2,99	Less Effective
2,99 < Y ≤ 3,49	Effective
3,49 < Y ≤ 4,00	Very Effective

2. Initial Data Analysis

   Initial data analysis is to test the hypothesis and answer the problem formulation. Initial data analysis includes data normality test, data homogeneity test, and mean similarity test. The criteria are as follows:

   a) Normality Test

      The normality test is carried out to determine whether the data to be analyzed is normal or not[37]. The test was carried out using the SPSS program with the Kormogolov-Smirnov test. Test decisions and conclusions are taken at a significant level of 5%. The hypothesis formulation used in the data normality test in this study is as follows:

      H_0 : normally distributed data

      H_1 : the data is not normally distributed.

      Hypothesis testing criteria are as follows:

      If the significance value (Sig.) > 0.05 then the research data is normally distributed. If the significance value (Sig.) ≤ 0.05 then the research data is not normally distributed.

   b) Homogeneity Test

      The homogeneity test is carried out to determine whether the data obtained from the two groups have homogeneous variants or not[38]. The homogeneity test was carried out to determine whether the variance of the data from the sample of control class students and experimental class students being analyzed was homogeneous or not, it was necessary to test the homogeneity of the variance first

[37] Arif Rachman Et Al., *METODE PENELITIAN KUANTITATIF, KUALITATIF DAN R&D*, 2014.

[38] Arif Rachman Et Al., *Metode Penelitian Kuantitatif, Kualitatif Dan R&D*, 2014.

using the SPSS-assisted F test. The hypothesis formulation used in the data homogeneity test in this study is as follows:

H_0 : $\sigma_1^2 = \sigma_2^2$, both variances are homogeneous.

H1: $\sigma_1^2 \neq \sigma_2^2$, both variances are not homogeneous.

The statistical model in the sentence description is as follows:

H_0 : there is no difference from several groups of data (homogeneous)

H_1 : there are differences from several groups of data (not homogeneous)

Hypothesis testing criteria are as follows:

If the significance value (Sig.) <0.05 then it is said that the variance of the two population groups of data is not the same (not homogeneous). If the significance value (Sig.) > 0.05 then it is said that the variance of the two population groups of data is the same (homogeneous).

c) Mean Equality Test

The hypothesis analysis of the mean similarity test aims to answer the problem, namely whether there is an average difference in the ability to master grammar (present and past) of experimental class students and control class students[39]. The average similarity test uses the two independent samples t test technique. The test steps are as follows:

H_0 : $\mu_1^2 = \mu_2^2$, there is no difference in the average ability to master grammar (present and past) of experimental class students and control class students.

H_1 : $\mu_1^2 \neq \mu_2^2$, there is an initial average difference in the ability to master grammar (present and past) of experimental class students and control class students.

Description:

μ_1 : the average grammar mastery ability (present and past) of students using comic strips treatment. (experimental class)

μ_2 : the average grammar mastery ability (present and past) of students without using comic strips treatment. (control class).

[39] Arif Rachman Et Al., *Metode Penelitian Kuantitatif, Kualitatif Dan R&D*, 2014.

d) Effectiveness analysis

The effectiveness analysis developed is to complete the final data analysis which includes independent sample t-test, one sample t-test, and N-Gain test.

1. Independent Sample T-Test

The independent sample t-test hypothesis analysis aims to answer the problem, namely whether there is a difference in the final average of students' grammar skills (Present and Past Tenses) for experimental class students using treatment and control class students. The independent sample t-test uses two independent sample t-test techniques. The test steps are as follows:

$H_0 : \mu_1^2 = \mu_2^2$, there is no difference in the final average of grammar mastery of experimental class students and control class students.

$H_1 : \mu_1^2 \neq \mu_2^2$, there is a difference in the final average of grammar mastery of experimental class students and control class students.

Description:

μ_1 : the average grammar mastery of students using comic strips media treatment. (experimental class)

μ_2 : the average grammar mastery of students without using comic strips media treatment. (control class).

The t-test formula for two independent samples is as follows. If the variance is homogeneous

With $$t_{hitung} = \frac{x_1 - x_2}{S_{gabungan}\sqrt{\frac{n_{1+n_2}}{n_1+n_2}}}$$

If the variance is not homogeneous

$$S_{gabungan} = \sqrt{\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}}$$

$$t_{hitung} = \frac{x_1 - x_2}{\sqrt{\frac{n_{1+n_2}}{n_1+n_2}}}$$

Description:

X_1 = Average grammar mastery of experimental class students

X_2 = Average grammar mastery of control class students

S_2^1 = Variance of experimental class students

S_2^2 = Variance of control class students

n_1 = The number of experimental class students

n_2 = Number of control class students

2. The paired sample t-test

hypothesis analysis aims to answer the problem, namely whether there is an average difference in grammar skills (Present and Past Tenses). The paired simple t-test or paired test is used to determine the difference in the average value before being given treatment (pretest) with the average value after being given treatment (posttest) using comic strips. The hypothesis used is:

H_0 : there is no increase in the average pretest score and posttest score.

H_1 : there is an increase in the average pretest score and posttest score. Decision making for paired test results, namely if $t_{count} > t_{tabel}$ or $- t_{count} < - t_{tabel}$ then H1 is accepted, otherwise if $_{tcount} < t_{tabel}$ or $- t_{count} > - t_{tabel}$ then H1 is rejected.

From the paired test results, it will be known the effectiveness of using comic strips as a medium to improve the grammar skills (Present and Past Tenses) of junior high school students with the decision if H_1 is accepted, it means that there is an increase in the average pretest score with posttest scores, otherwise if H_1 is rejected, it means that there is no increase in the average pretest score with posttest scores.

3. One Sample T-Test

The one sample t-test hypothesis analysis aims to answer the problem, namely whether the grammar skills (Present and Past Tenses) taught using comic strips media reach the KKM. The criteria for effectiveness in hypothesis analysis if the minimum posttest score is included in the good criteria, namely more than 70:

H_0 : $\mu_e \leq 70$ Grammar skills (Present and Past Tenses) of students taught with comic strips media did not reach KKM.

H_1 : $\mu_e > 70$ Grammar skills (Present and Past Tenses) of students taught with comic strips media reached the KKM.

Taraf Significantion $\alpha = 5\%$

$$t = \frac{X - \mu_e}{s/\sqrt{n}}$$

Description:

$\bar{X}$: average x_i

μ_e : hypothesized value (70)

s : standard deviation

n : number of students

Decision criteria: H_0 is rejected if $t_{count} < t_{tabel}$ or H_0 is accepted if the significance value is less than 0.05

4. Nominalized Gain Test (N-Gain)

The normalized gain test (N-Gain) was conducted to determine the improvement of students' grammar skills (Present and Past Tenses) by using comic strips. This increase is taken from the pretest and posttest scores obtained by students. The normalized gain or N-Gain test is the difference between the posttest and pretest scores. The problem in a group of high gain scores, where the final scores of students are high and the initial scores of students are low. The actual gain score is the gain score obtained by students while the maximum gain score is the gain score that students may get. The calculation of the normalized gain score (N-Gain) can be expressed by the following :

$$< g >= \frac{< Sf > - < Si >}{100 - < Si >} \times 100\%$$

Description:

<g> = normalized gain (N-Gain)

<Sf> = Posttest Score

<Si> = Pretest score obtained

<g> is the normalized Gain (N-Gain). Classification of <g>

Interpretation according to Hake in Nurjanah

Table 3.2. Magnitude of Gain

Magnitude of Gain	Interpretation
$\langle g \rangle \geq 0,7$	High
$0,7 > \langle g \rangle \geq 0,3$	Medium
$\langle g \rangle < 0,3$	Low