CHAPTER III
METHODOLOGY

A. Research Design

Quantitative approaches were used in this study, John and David Cresswell said that quantitative research allowed for the objective testing of hypotheses via the analysis of correlations between variables and comparisons between different groups. The researchers used specific equipment to measure variables, and then they used statistical methods to analyse the numerical data (Creswell John and Creswell David, 2023). Consistent with this method, Zyra et al. said that experimental research was a kind of quantitative research that included administering a treatment to examine its impact on the outcomes. In order to establish a clear link between the therapy and the outcome, this study was conducted under controlled settings (Zyra et al., 2022).

Using established metrics, this study set out to determine how a given variable affected the outcome. There was a control group in this quasi-experimental investigation, however the researchers were unable to eliminate confounding variables. This study employed a nonequivalent control group design, which compares pre- and post-treatment outcomes to identify any changes in treatment efficacy. Eleventh graders from SMAN 1 Bengkulu City participated in a quasi-experimental research that compared the impact of the

Cooperative Learning Method utilising the Team Games Tournament (TGT) model on their writing abilities. The control group was administered both a pretest and a posttest. Two groups of students participated in the study; one utilised the conventional approach to education, while the other employed the cooperative learning strategy known as the Team Games Tournament (TGT) model. After a preliminary assessment of their students' writing abilities, both groups participated in an intervention lasting several weeks. The experimental group learnt the material using a cooperative learning approach based on a tournament model of team games, while the control group used a more traditional approach. Students in both groups will take a posttest after the intervention to see how much their writing has improved. Using descriptive statistics and an independent t-test, researchers examined the pretest and posttest data to see whether the students' writing abilities were significantly different in the two groups. Also, while the experimental group was utilising the team games tournament concept, we tested their writing abilities to get their comments. Examining the Impact of a Team Games Tournament (TGT) Model on the Writing Proficiency of Eleventh Graders at SMAN 1 in Bengkulu City was the Overarching Goal of This Research.

Table 1. Pre-Test and Post-Test Nonequivalent Control Group Design

Group	Pre-test	Treatment	Post-test
Control class	O1	X	O2
Experiment class	O3		O4

Description:

E : Experimental group

K : Control group

X : Learning Method

O1 : Pretest in experimental class

O2 : Posttest on the experimental class

O3 : Pretest in control class

O4 : Posttest on control class

B. Time and Place of the Research

This research was located at SMAN 1 Bengkulu city, where the school was located at Kuala Lempuing street, Lempuing Village, Ratu Agung sub-district, Bengkulu city. The location for this research was chosen because the researcher had easier access to collect the data.

C. Population and Sample

1. Population

Choosing the people who will make up the research's demographic and sample is the next stage. Any and all instances, entities, or objects that make up the subject of a study are collectively referred to as the population in research. This sample encompasses everything the researcher is interested in studying for their findings. Population definition was a crucial part of the study design process since it defined the parameters within which the research could be conducted.

According to Ahmad et al. (2023), while studying education, the term "population" was used to describe specific interest groups like schools, students, instructors, or courses of study. Four hundred thirty eleventh graders from twelve different classrooms at SMAN I Bengkulu City made up the population of this research:

Table 2. Total Number of Class XI SMAN 1 Bengkulu City

No	Class	Total
1.	XI 1	36
2.	XI 2	36
3.	XI 3	36
4.	XI 4	36
5.	XI 5	36
6.	XI 6	36
7.	XI 7	36

8.	XI 8	36
9.	XI 9	36
10	XI 10	35
11.	XI 11	36
12.	XI 12	35
Total amount		430

sources : (SMAN 1 Bengkulu City : 2024.)

2. Sample

In research, a sample was a portion of the population chosen to be the focus of the study. This sample represented a smaller and more manageable group, which the researcher used to make inferences about the entire population (Ahmad et al., 2023). In the opinion of Duka et al, purposive sampling was a sampling process that was carried out with certain considerations (Duka et al., 2020). In this case, the consideration of researchers and teachers became the basis for choosing experimental and control classes. It was Considered based on the circumstances and needs of students who still had a passive tendency in learning and others. After that, there were classes that were used as samples for this study, namely class XI 3, totaling 36 people, as an experimental class and class XI 1, totaling 36 people, as a control class:

Table 3. total students in the experiment and control class

No	Class	Male	Female	Total
1.	Experimental group	14	22	36
2.	Control group	18	18	36
Total				72

D. Operational Definition of Variables

1. Writing skills

   Writing in the narrow sense refered to glottography (writing as a representation of language), while in the broad sense, writing also included semasiography (symbols that conveyed meaning without words) (Bisang et al., 2022).

2. Team games tournament (TGT)

   Teams-Games-Tournament (TGT) was a cooperative learning method from Johns Hopkins developed by DeVries and Slavin. TGT was similar to STAD, but used weekly tournaments instead of quizzes. Students competed in groups of three against friends of similar ability, and the winner got points for his team. And the high-scoring Team received an award (Slavin, 1991).

E. Data Collection Technique

Data collection was a stage in research where researchers interacted directly with the object under study to obtain the necessary information or data (Sugiyono, 2003). Data collection techniques were divided into observation, test, and documentation methods (Amelia et al., 2023)

1. Test

   After implementing the Team Games Tournament (TGT) paradigm, students' writing abilities were evaluated using a test. This assessment might be administered in the form of questions or assignments designed to gauge the extent to which pupils have improved their writing abilities. The findings could only be trusted if the tests were carried out with sufficient frequency, using precise evaluation criteria, and supported by solid statistical evidence.

   a) Pre-test

      Pre-test was a test given before the learning process began, to find out the extent to which students already understood the material to be taught. This test was useful to see how effective the learning that would be given later (Siregar Aisyah et al., 2023). As part of this study, the pre-test was given to assess the effectiveness of the learning method to be applied, namely the Team Games Tournament (TGT)

cooperative learning model. A pre-test was administered to students in both the experimental and control groups. Each group consisted of 36 students, with a total of 72 participants. This test was conducted before the learning process began to assess students' writing skills before getting treatment. The pre-test consisted of one essay question on writing an Analytical Exposition text on the topic "Social Media Use among Teenagers: Positive and Negative Impacts." Students were asked to write the text complete with the structure of Thesis (Introduction), Arguments with Supporting Evidences, and Reiteration (Conclusion). The tests were conducted in their respective classrooms in a quiet and conducive atmosphere, and were supervised by the researcher and the English teacher to ensure that the test results reflected the students' original abilities without any external assistance.

b) Post-test

The post-test was administered after the completion of the learning process. The objective was to assess the level of comprehension and competency that students achieved after engaging in learning activities (Siregar Aisyah et al., 2023). The purpose of this assessment was to compare the performance of

the experimental and control groups of students after the implementation of the learning therapy. There was simply one essay question on "Social Media Use among Teenagers: Positive and Negative Impacts" for both the pre- and post-tests. The required format for student writing was an introduction, body paragraphs containing the thesis and supporting evidence, and a conclusion. Upon completion of all lessons, the post-test was administered at the final session.

c) Treatment

The treatment in this study was the implementation of the Team Games Tournament (TGT) model to improve students' writing skills during the learning process. The study involved two groups: the experimental group, which received the TGT treatment, and the control group, which did not receive the treatment. The TGT model was implemented in the experimental group over four meetings. In the first meeting on April 14, 2025, the teacher introduced the concept and structure of analytical exposition text and divided students into team groups of 4-6 members and explained the rules and mechanisms of TGT. The second meeting on April 21, 2025, focused on group discussions to develop an analytical exposition text outline based on the given

topic, then the outline was presented and received feedback from the teacher. In the third meeting on April 24, 2025, students brought the results of the outline development into complete paragraphs, conducted discussions and revisions together in groups, then presented the writing results, followed by a rotating question and answer game using creative media to strengthen understanding. The fourth meeting on April 28, 2025, began with a similar game and continued with a tournament between teams, where student representatives answered questions in turn and competed in several rounds, with individual scores collected for team scores, ending with awards for the winning team. The whole treatment was designed to improve students' writing skills in an active and fun way through teamwork, healthy competition, and interactive and structured learning.

2. Student writing skills

In this study, the writing skill test was conducted using one question that had been validated by experts to accurately measure students' writing ability. The test was administered before and after the treatment using the cooperative learning method of the Team Games Tournament (TGT) model. The study involved two classes: the control group, which did not receive the TGT

model treatment, and the experimental group, which received the TGT model treatment. The single question was selected and validated to ensure its suitability for measuring students' writing skills on analytical exposition text material. Additionally, the topic for the question was chosen based on a topic selection questionnaire conducted by the students, so that the topic used matched the students' interests and preferences.

Tabel 4. Interval Scores for Writing Skills in English Language Teaching

Content	
30-27	Highest Quality to Very Highest Quality: informed, substantial, etc..
26-22	A decent to average level of topic knowledge, an acceptable variety of skills, etc.
21-17	Inadequate to Fair: lack of topic expertise, insufficient content, etc.
16-13	Disappointing; demonstrates zero understanding of the material.
Organization	
20-18	Highest Quality to Very High Quality: articulate thoughts with ease,
17-14	Good to Average: a little disjointed, but the essential points are clear, etc.
13-10	From Good to Average: rather jumbled, but the main ideas are there, etc.

9-7	From Good to Average: rather jumbled, but the main ideas are there, etc.
Vocabulary	
20-18	Exceptional to Very Good: a wide vocabulary; good use of idioms and words; etc.
17-14	Good to Average: sufficient scope; sometimes misuses words or idioms without distorting their meaning.
13-10	Limitations in vocabulary, spelling, punctuation, and use; poor to fair quality overall.
9-7	Absent understanding of the English language and its lexicon; translation skills very lacking.
Language use	
25-22	Superior to Good: efficient complicated structures, etc.
21-19	Between Good and Average: Simple yet Effective Constructions, etc.
17-11	Good to Bad: serious issues with both basic and complicated structures, etc.
10-5	Very Unskilled: hardly any understanding of how to properly compose sentences, etc.
Mechanics	
5	Displays exceptional to very good command of conventions, etc.
4	Good to Average: a few typos and

	grammatical mistakes here and there
3	Common spelling, punctuation, capitalization, and other mistakes; fair to poor quality.
2	Badly written; misspellings, capitalization mistakes, improper paragraphing, etc., show a lack of familiarity with standard writing practices.

Sources : (Heaton, 1976)

Tabel 5. Indicators for Essay Test – Writing Task (Analytical Exposition Text)

Category	Indicators	Score Range
Content	The student demonstrates a good understanding of the chosen topic.	30 - 27
	Ideas are substantive and well-developed.	26 - 22
	Arguments are relevant and logically support the thesis.	21 - 17
	Content is limited, lacks depth, or is irrelevant.	16 - 13
Organization	The text follows the complete structure of an Analytical Exposition (*Thesis, Arguments, Reiteration*).	20 - 18
	Paragraphs are well-structured, with clear relationships between ideas.	17 - 14
	The flow of ideas is inconsistent, and the organization is unclear.	13 - 10
	No clear organization; ideas are	9 - 7

	disconnected.	
Vocabulary	Uses a sophisticated and effective range of vocabulary in an academic context.	20 - 18
	Adequate range of vocabulary with occasional errors in word choice.	17 - 14
	Limited vocabulary range with frequent errors in word usage.	13 - 10
	Very poor vocabulary usage, making it difficult to understand.	9 - 7
Language use	Uses complex sentence structures effectively.	25 - 22
	Sentences are simple but effective, with minor errors.	21 - 19
	Frequent grammatical errors that affect comprehension.	17 - 11
	Almost no mastery of correct sentence structure.	10 - 5
mechanics	Correct spelling, punctuation, and writing conventions are applied.	5
	Only a few minor spelling and punctuation errors.	4
	Frequent errors in spelling and punctuation.	3
	Many errors in spelling,	2

	punctuation, and formatting.	

3. Documentation

The documentation technique was a data collection method that was carried out by collecting information from various documents or written sources. These documents could be texts, reports, notes, archives, journals, or other recordings related to the research objectives (Amelia et al., 2023). The documentation included a list of names of students who became research subjects along with the values needed for research purposes. In addition, the documentation also contained photographs of learning activities as well as pre-test and post-test results of the material that had been taught.

F. Research Instrument

In order to collect, evaluate, and interpret data in accordance with the study's objectives, a research instrument was created in a methodical and scientific fashion. Whether qualitative, quantitative, or a hybrid technique was used to determine the instrument that was used for the study. Questionnaires, assessments, interviews, measurements, stories, focus groups, experiments, observation sheets, and other forms of data collecting might have served as instruments (Oben, 2021).

Using a writing exam as its major instrument, this study combined a quantitative technique with a quasi-experimental design. Students' writing skills were evaluated both before and after the Team Games Tournament (TGT) model, a cooperative learning technique, was implemented. To determine whether there was a statistically significant change in writing performance after treatment, the experimental and control groups were both given the writing evaluation.

An analytical exposition text served as the basis for the essay that students were asked to write for the exam. The assignment required them to compose a whole piece of writing, including an introduction (the thesis statement), body (the arguments) with appropriate evidence, and conclusion (reiteration). To guarantee consistency and dependability in measuring students' development, the identical writing assignment was used for both the pre-test and post-test. In order to determine how the TGT model affected students' writing abilities, we looked at the results of this test.

G. The Technique of data analysis

1. Item difficulty test

   The level of difficulty was a measure that showed how difficult a question item was, which was expressed in numerical form. A question was considered good if it was neither too easy nor too difficult (Saputri et al., 2023).

   The general formula is :

$P = \frac{Rh+Ri}{Nh+Ni}$ X 100%

Description:

P = Difficulty level in percent

N_h = Number of test takers in high score group

R_h = Number of correct answers in high score group

N_i = Number of test takers in low score group

R_i = Number of correct answers in low score group

$P = \frac{649+395}{10+10}$ X 100%

P = 52,2%

Table 6. Interpretation of Difficult Question Categories

Question category	Interpretation of results
Classified as easy	71% ---------- 100%
Classified as medium	41% ---------- 70%
Classified as difficult	21% ---------- 40%

Sources: (Press, 2019)

In this study, the researcher only used one question, namely writing questions in the form of analytical exposition text. To test the difficulty of the question, researchers took data from the pretest scores. This was done before the experimental treatment was given, with the aim of ensuring that the questions used were appropriate and belonged to the medium difficulty category.

The difficulty level analysis showed that the tested questions achieved a value of 52.2%. According to the applicable criteria, this figure was included in the moderate category, because it was in the range of 41% - 70% which was categorized as moderate difficulty. Therefore, the questions were suitable for use in this study.

2. Item Discrimination Test

Ferguson devised a formula to measure how well a test, including essay questions, differentiated between students. This formula compared the number of score differences that actually appeared on the test with the maximum number of possible differences. In other words, Ferguson's formula was used to see if the questions in the test were effective enough to differentiate students based on their ability levels (Pascasarjana Undiksha, 2020).

In this study, the researcher only used one question, namely writing questions focused on analytical exposition texts. To test the differentiation of questions, researchers took data from students' pretest scores. Data collection was carried out before the experimental treatment was given, with the aim of ensuring that the questions used were not only appropriate in terms of difficulty level, but also had a good ability to distinguish students based on their writing ability.

The writing tasks were evaluated through an analytical approach, focusing on five criteria: content, structure, vocabulary, grammar, and mechanics, which were then summed up into a final score in the range of 1-100. This final score was grouped into several score intervals for analysis purposes. Ferguson's formula for the differentiation index was as follows.

$$D=\frac{N^2-\sum fi^2}{N^2-\frac{N^2}{n+1}}=\frac{(n+1)\left((N^2-\sum fi^2\right)}{nN^2}$$

Which is:

d = T-test power index

N = number of test takers

f_i = frequency of each score

n = number of score intervals

interval score	f_i	F_i^2
31-40	4	16
41-50	17	289
51-60	7	49
61-70	6	36
71-80	2	4
totally	36	394

$$D=\frac{(n+1)\left((N^2-\sum fi^2\right)}{nN^2}$$

$$D=\frac{(5+1)\left((36^2-394\right)}{5.36^2}$$

$$D= \frac{(6)((1.296-394)}{5.1296}$$

$$D= \frac{6.902}{6480}= \frac{5.412}{6480}=0,83$$

Tabel 7. Classification of Item Distinguishing Power

Distinguishing Power Category	Coefficient
Good	0-40 – 1,00
Medium (No need for revision)	0,30 – 0,39
Needs revision	0,20 – 0,29
Not good	-1,00 – 0,19

Sources : (Ndiung & Jediut, 2020)

The differentiation test was carried out using the Ferguson discrimination index formula, which aimed to see how well the assessment instrument was able to distinguish between high and low ability students.

Based on calculations using the Ferguson discrimination index formula, a differentiation value of 0.83 was obtained, which was included in the "Good" category (0.40 - 1.00). This value indicates that the scores obtained by students were fairly evenly distributed, and reflected the differences in student abilities clearly.

Thus, the writing questions had a very good ability to differentiate students based on their ability levels. This test was effective and was feasible to use as a research

instrument, especially in measuring students' writing skills on analytical exposition text.

3. Normality test

The normality test was considered a key procedure among the goodness-of-fit (GOF) tests (Khatun, 2021). To establish if the data was normal or not, a test was often utilized. The normality test's goal was to ascertain if the instrument was normal. Whether or not the research was generally circulated Researchers used SPSS to test for normality and establish what was normal.

- Sig Value (P Value) < 0,05 concluded that the data was not normally distributed.
- Sig Value (P Value) > 0,05 conclude that the data was normally distributed.

4. Homogeneity test

The homogeneity test determined whether or not population data was homogeneous. The criteria for assessing homogeneity were as follows:

a) The significance level (α) was set at 0.05.
b) If the significance value (sig) was greater than α, it indicated that the variances of the samples were equal (homogeneous).
c) If the significance value (sig) was less than α, it showed that the variances of the samples were

different (not homogeneous). To perform this test, the researcher utilized SPSS software.

5. T-test

   The t-test was a powerful tool, but its effectiveness could have been compromised in certain situations, such as when the data was not normal or when it was used on data that was not suitable. Therefore, there was a need for alternative approaches or modifications to overcome this (Novak, 2022).

6. F-test

   The F-test, named after George W. Snedecor in honor of Sir Ronald Fisher who originally developed it, served as a statistical method to compare two variances. It was also applied in analyses such as ANCOVA and multiple regression. In addition, the F test had a function that was to evaluate whether linear regression used the most appropriate line for a particular data set. therefore, this F test was calculated as a ratio of variances and various evaluation statistics involved the f value known as the F test (Odek & Opuodho, 2023).

7. The effect size

   Effect size was a measurement used to describe how large the influence or relationship between two variables in a study was. This measurement was important because it not only showed whether an influence existed

or not, but also explained how strong that influence was. Two commonly used effect size measurements were Cohen's d**,** which measured the difference in the average scores between two groups, and Pearson's r**,** which measured how strong the relationship between two variables was (Funder & Ozer, 2019). The effect size values below were used to assess the strength of the impact or connection between two variables in the study.

Tabel 8. Value of the Effect Size

No	Value	Effect size
1.	0-00-0,1,95	very weak effect
2.	0,20-0,395	weak effect
3.	0,40-0,595	modest effect
4.	0,60-0,749	strong effect
5.	0,80-1,00	very strong effect

Source: Jacob Cohen, 2019

8. Statistical Hypothesis

This research used hypothesis testing to find out whether the Team Games Tournament (TGT) cooperative learning strategy improved students' writing abilities. Here are the theories that were put forth:

a) If the p-value was less than 0.05, then Ho was rejected and Ha was accepted, meaning the Team Games Tournament (TGT) model had a significant impact on students' writing skills.

b) If the p-value was equal to or greater than 0.05, then Ho was accepted and Ha was rejected, indicating that the Team Games Tournament (TGT) model did not have a significant impact on students' writing skills.