

CHAPTER III

RESEARCH METHOD

This chapter discusses the method used in this study, it covers research design, instrument, population and sample, research instrument, treatment procedures, data collection, and data analysis to answer the research question in Chapter 1.

A. Research Design

This study utilized a quantitative research method with an experimental framework. It employed a quasi-experimental design to evaluate the impact of using ChatGPT on students' writing of recount texts. Both a pre-test and a post-test were conducted to both the experimental group and the control group. As noted by Cook (2015), quasi-experiments often assess the causal effects of enduring interventions outside of laboratory to test if there are any significant differences. Therefore, the researcher believes that using quasi-experimental, it can provide detailed and comprehensive data and shows the significances different. This method design begins with collecting the data after pre-test and post-test, distributing assessment to obtain quantitative data, and conducting in interviews for supporting data.

Quasi-experimental research is carried out when researchers cannot randomly select a sample from the population for their study. In this approach, subjects are assigned to different groups, each receiving different treatments, often based on the organization of the classroom in a school setting. This design was appropriate given the natural classroom setting, where randomization was not

feasible due to administrative and logistical constraints (Creswell & Creswell, 2018).

The study involves two groups: an experimental group, which using ChatGPT as a helping tool, and a control group, which relies on conventional technique which is peer-correction.

This study investigates the effectiveness of using ChatGPT in enhancing students' writing skills at the high school level. ChatGPT serves as the independent variable, as it represents the instructional intervention implemented during the treatment. The dependent variable is the students' writing skills, which reflects their ability to organize, develop, and express ideas in written English. A quasi-experimental design with pre-test and post-test control groups is employed to measure the impact of ChatGPT-assisted writing activities compared to conventional classroom writing instruction.

Table 3.1 Research Design

Group	Pre-Test (Y1)	Treatment (x)	Post-Test (Y2)
Experimental	Y1	(Using ChatGPT)	Y2
Control	Y1	(Using peer-correction)	Y2

The variables consist of an independent and a dependent variable. The independent variable is the use of ChatGPT (X), which serves as the factor expected to bring about change. Meanwhile, the dependent variable is the students' writing skills (Y), which is the outcome being measured as a result of the treatment.

B. Population and Sample

Population and sample play an important role in research. According to Hossan et al. (2023), population is the entire group of individuals or objects that are observed in a study. However, researchers usually do not collect data from the whole population because of time and practical limitations. Therefore, a sample is selected to represent the population. By using a representative sample, researchers can obtain data that reflect the characteristics of the population and support the research findings.

In this case, the population of this study was the eleventh-grade students of SMK AL-Huda Kota Kediri. There are 11 classes in the eleventh grade, totaling 285 students in the population.

Table 3. 2 Total of Each Students in Classroom

Classes	Total of the students
XI-TPm 1	30
XI-TPm 2	27
XI-TSM 1	28
XI-TSM 2	27
XI-PF	16
XI-TITL	21
XI-TSM 2	27
XI-TKR 1	36
XI-TKR 2	38
XI-TKJ 1	31
XI-TKJ 2	31
Total	285

Therefore, the researcher only chose two classes namely XI-TITL and XI-TKJ 1. Each class consisted of more or less 16-38 students. These classes were based on the researcher's teaching and observing experience in the SMK AL-Huda Kota Kediri on eleventh grade, during which students demonstrated quite similar difficulties in writing English texts particularly Recount. Therefore, the researcher implemented ChatGPT into the learning process to address this issue.

C. Research Instrument

The research instrument for this study will be a writing assessment, the researcher will ask students to write recount text based on the theme the researcher give. The assessment will be given to students in pre-test and post-test. Then the total score of the assessment from each group will be measured using a scoring rubric from brown (2007).

The pre-test was given before students received the treatment. Then, both pre-test post-test assessment was measured using a scoring rubric from Brown (2007) that assesses content, organization, grammar, vocabulary, and mechanics. The pre-test is done to obtain prior information about students' writing skills level before receiving treatment. The students will be instructed by teacher to write down their experience with the topic of "Vacation", the test will be 80 minutes long, the minimum words are 200 with the maximum of 500 words. The complete pre-test can be seen in appendix 1.

After the treatments, students from the control and experimental groups did the post-test. According to Pan & Sana (2021), post-testing involves taking tests

after information is studied. Meanwhile, The post-test aims to evaluate whether significant differences exist between the result of pre-test and post-test results after the treatment, which the experimental group using ChatGPT and for the control group using peer-correction. The post-test also involves writing recount text on a different topic from the pre-test. For the post-test students will write down recount text with the topic of “The happiest moment in my life”, the test will be 80 minutes long, the minimum words are 200 with the maximum of 500 words. The complete pre-test can be seen in appendix 2.

Table 3.3 Scoring rubric from Brown (2007)

Aspect	Score	Performance Descriptive
Content (C) 30 % - topic - detail	4	The topic is complete and clear and the details are relating to the topic
	3	The topic is complete and clear but the details are almost relating to the topic
	2	The topic is complete and clear but the details are not relating to the topic
	1	The topic is not clear and the details are not relating to the topic
Organization (O) 20 % - identification - description	4	Identification is complete and descriptions are arranged with proper connectives
	3	Identification is almost complete and descriptions are arranged with almost proper connectives
	2	Identification is not complete and descriptions are arranged with few misuse of connective
	1	Identification is not complete and descriptions are arranged with misuse of connectives
Grammar (G) 20 %	4	Very few grammatical or agreement inaccuracies
	3	Few grammatical or agreement inaccuracies but not effect on meaning
	2	Numerous grammatical or agreement inaccuracies
	1	Frequent grammatical or agreement inaccuracies
Vocabulary (V) 15 %	4	Effective choice of words and word forms
	3	Few grammatical or agreement inaccuracies but not effect on meaning
	2	Limited range confusing words and word forms

	1	Very poor knowledge or words, word forms, and not understandable
Mechanics (M) 15 % - Spelling - Punctuation - Capitalization	4	It uses correct spelling, punctuation and capitalization
	3	It has occasional errors of spelling, punctuation and capitalization
	2	It has frequent errors of spelling, punctuation and capitalization
	1	It is dominated by errors spelling, punctuation and capitalization

$$\text{Score} = \left(\frac{3C + 2O + 2G + 1.5V + 1.5M}{40} \right) \times 10$$

D. Treatment Procedures

This research will be conducted in 5 meetings, the first and last meetings are the pre and post-test for the students, the remaining weeks are the treatment for both group control group using conventional technique (Peer-correction), and for the experimental group using ChatGPT. This study applies a three-stage teaching procedure pre-teaching, whilst-teaching, and post-teaching to guide the learning process

Table 3.4 Stages of Treatment Procedures

Stages	Experimental class	Control Class
Pre-teaching	Teacher greets the students and conducts a short brainstorming session about recount text and their experiences. Teacher introduces ChatGPT as a learning media to students Teacher explains the purpose of the lesson and the learning objectives related to writing skills.	Teacher greets the students and conducts a short brainstorming session about recount text and their experiences. Teacher introduces the topic and explains the learning objectives. Teacher distributes the example of printed recount text from the school's coursebook.

Whilst-Teaching	Teacher then explains how recount text is structured and how to analyse the text. Then Students are instructed to read a selected short recount story from internet from their phones. After students read the example of recount text, teacher asks students to identify the structure of the text, and at some point, teacher will ask about the structure to build knowledge and group discussion. After students identify the text, teacher instruct them to write their own story, teacher will instruct the students to write their most heartbreaking experiences. Then they will use ChatGPT with specific prompts for helping them correcting their mistakes. The prompts that were given to ChatGPT include: <i>(1) write me comments and suggestions about the content of the recount; (2) write me comments and suggestions about the organization of the recount text; (3) please provide comments and suggestions about the language components of the recount text.</i>	Teacher then explains how recount text is structured and how to analyse the text. Then Students are instructed to read a selected printed out recount story from the teacher. After students read the example of recount text, teacher asks students to identify the structure of the text. At some point teacher will ask about the structure to build knowledge and group discussion. Students answer questions given by the teacher as individually or in pairs, followed by class discussion. Teacher then instructs students to write recount text based on their experiences, with the theme “most heartbreaking experiences” Then teacher asks students to make group in pairs to do peer-correction Teacher gives the students the peer-correction guide to help them analyzing the text (see appendix 3)
Post-Teaching	Teacher reviews student responses and clarifies misunderstandings. Vocabulary and structure exercises from the coursebook are assigned for reinforcement. Teacher summarizes the story and highlights key reading strategies used. Follow-up reading assignment is given from the coursebook.	Teacher reviews student responses and clarifies misunderstandings. Vocabulary and structure exercises from the coursebook are assigned for reinforcement. Teacher summarizes the story and highlights key reading strategies used. Follow-up reading assignment is given from the coursebook.

E. Data Collection

The data collection for this study will focus on pre-test and post-test result, and involved three phases.

1. The first phase is conducting the pre-test. According to Pan & Sana (2021), the pre-test should be conducted one week before treatment. Students will be told to be confident in their answers and be natural with it. Then the researcher will gather all the results and compare them to the results from the post-test.
2. The second phase is treatment, During the treatment phase, experimental group will be using ChatGPT as a tool for their works and as for the control group will be using Peer-correction.
3. The third phase is post-test, A post-test will be conducted after the treatment for both group which on the last week using writing assessment. Same as the first phase, students will be told to be confident with their answer and be natural with it.

The scores result of both groups then will be analyzed and then the pre-test and post-test results from both groups is used to determine the effectiveness of using ChatGPT as a tool in enhancing students' writing skills.

F. Data Analysis

In this study, quantitative data was collected through a post-test administered to both the experimental and control groups. The researcher employed ANCOVA analysis using IBM SPSS to analyze the data. According to Jamieson (2004), ANCOVA is a statistical technique used to compare group differences

while controlling for the influence of one or more covariates. Typically, the posttest score is treated as the dependent variable and the pretest score as the covariate, allowing the analysis to adjust for baseline differences and isolate the effect of change. After conducting the analysis, the researcher compared the results of both groups to see if there is significant different on students' writing skills.

The students' writing scores are assessed based on five aspects, each with a score or level adapted from Brown (2007). The maximum total score for the five aspects is 25. The scoring system is calculated as follows:

$$\text{Skor} = \left(\frac{3C + 2O + 2G + 1.5V + 1.5M}{40} \right) \times 10$$

After collecting the data, which includes pre-test and post-test scores from both the experimental and control groups, the researcher proceeds with data analysis. Utilizing IBM SPSS, the researcher compares the results of the two tests to determine if the use of ChatGPT has a significant impact on writing skills.

1. Prerequisite Test

Before conducting the main analysis using ANCOVA (Analysis of Covariance), It is important to conduct several prerequisite tests first to make sure that the assumptions required by this statistical method are properly fulfilled. These prerequisite tests help validate the accuracy and reliability of the ANCOVA results by checking the characteristics of the data. In this study, which examines the effectiveness of using ChatGPT in enhancing students' writing skills at the high school level, the dependent variable is students' post-test writing scores, while the covariate is their pre-test scores. The following four assumptions must be tested:

a) Normality Test

In this study, the dependent variable is the students' post-test writing scores. The assumption of normality requires that these scores are normally distributed in both the experimental group (ChatGPT-assisted learning) and the control group (Peer correction guide). The Shapiro-Wilk test is employed to assess the normality.

b) Homogeneity of Variances

The homogeneity of variances ensures that the statistical comparison between the two groups is fair and not influenced by unequal variability. Levene's test is employed to determine the homogeneity of variances between control and experimental group. If the result of the variance homogeneity test exceeds 0.05, it indicates that both the pre-test and post-test conditions shows equal variance homogeneity

c) Homogeneity of Regression Slopes

This assumption examines whether the relationship between the covariate (pre-test writing scores) and the dependent variable (post-test writing scores) is consistent across all groups. In simpler terms, the slope of the regression line between pre-test and post-test scores should be similar in both the ChatGPT group and the control group.

d) Linearity Between the Covariate and the Dependent Variable

This assumption states that the covariate must have a linear relationship with the post-test scores. A linear relationship means that as the pre-test score increases, the post-test score tends to increase at a consistent rate.

2. Hypothesis Testing

ANCOVA is a statistical method used to assess the impact of categorical independent variables on multiple quantitative dependent variables. In this study, hypothesis testing involved conducting ANCOVA analysis using IBM SPSS.

- a. If the obtained significance value < 0.05 , it indicates a significant difference in students' writing skills between those who use ChatGPT and those who use Peer correction guide. This supports the alternative hypothesis (H_{a1}) and rejects the null hypothesis (H_{o1}).
- b. If the significance value is greater than 0.05, it can be concluded that there is no significant difference between those who use ChatGPT and those who use Peer correction guide. This means that the alternative hypothesis (H_{a1}) is not supported and the null hypothesis (H_{o1}) is not rejected.