CHAPTER 3
RESEARCH METHODOLOGY

This chapter outlines the research methodology applied to collect and analyze the study's data. The discussion covers the research design, variables, population and sample, research instruments, research procedures, data collection techniques, and data analysis techniques.

A. Research Design

This study uses a quasi-experimental design featuring a non-equivalent control group. In this approach, two groups of students are compared: the experimental group, which receives instruction using Mentimeter, and the control group, which is taught using PowerPoint. Both groups take a pre-test prior to the treatment and a post-test after the treatment to assess their writing performance in analytical exposition texts. This design enables the researcher to determine whether the use of Mentimeter leads to a significant improvement in students' writing skills compared to PowerPoint.

A quasi-experimental design was selected because it is highly appropriate for educational contexts where randomly assigning participants to groups is often impractical. According to Creswell (2014), quasi-experimental designs are frequently used in classroom-based research since they allow researchers to assess the effectiveness of interventions while preserving the natural classroom setting. In the present study, the classes are pre-existing groups determined by the school, making random assignment impossible without disrupting the regular school schedule.

Furthermore, quasi-experimental designs provide a practical and ethical approach to testing educational innovations. Assigning students randomly to experimental or control groups can be impractical and sometimes unfair in real school settings. This design allows all students to benefit from their regular learning environment while still participating in the research. In addition, by using pre-tests and post-tests, the researcher

can measure changes in students' writing performance over time and determine the effect of the independent variable more accurately (Sukardi, 2019).

This approach also aligns with the objective of the study, which is to examine the effectiveness of Mentimeter compared to PowerPoint in improving students' writing skills. The use of a quasi-experimental design with pre-tests and post-tests allows the researcher to identify differences between the two groups and draw conclusions about the impact of the learning media on students' writing ability. This design is therefore appropriate for educational research in real classroom contexts and provides reliable data to address the research question.

Table 3.1 Research Design

Experiment Group	Pre Test	Treatment using mentimeter.	Post Test
Control Group	Pre Test	Treatment using power point.	Post Test

B. Variables

This study consists of two main variables. The independent variable variable (X) is the use of different types of learning media in teaching analytical exposition writing. The experimental group uses interactive media which is Mentimeter, while the control group uses conventional media which is power point. Learning media in this context refer to any tools or platforms used by teachers to deliver materials and facilitates student understanding. The dependent variable (Y) is students' writing ability, assessed in terms of content, organization, grammar, vocabulary, and mechanics.

C. Population and Sample

This study will be carried out in the even semester of the 2024/2025 academic year at SMKN 2 Kota Kediri, located in Kediri, East Java,

Indonesia. The researcher has selected SMKN 2 Kota Kediri because it houses a Hospitality and Tourism Department, whose students are currently learning how to write analytical exposition texts the core genre under investigation in this study. The researcher will administer a pre-test to establish baseline writing ability, conduct the treatment (instruction using specific tools), and then conduct a post-test to measure changes. The timeframe is chosen so that the intervention (treatment) and the measurement phases are close together, minimizing maturation or external learning effects.

The population for this study comprises all tenth-grade students in the Hospitality and Tourism Department at SMKN 2 Kota Kediri during the period of data collection. According to the school records, there are two classes in this department, with each class consisting of 32 students, giving a total population of 64 students. The decision to include both classes stems from the need to have sufficient numbers for statistical comparison, while also ensuring that the classes are as similar as possible in terms of instructional time, teacher, curriculum, and demographic profiles. Using both classes also helps to avoid selection bias and improves generalizability of the results within similar vocational school settings. It is expected that all students are native or near-native speakers of Bahasa Indonesia but are in the process of developing their English writing skills, particularly in academic genres, which is relevant for measuring their analytical exposition text writing ability.

The sample in this study was taken from the population by purposive sampling. Specifically, both existing intact classes of tenth-grade Hospitality and Tourism students were used: Class A served as the experimental group (receiving treatment using Mentimeter), and Class B served as the control group (receiving instruction using PowerPoint or conventional method). Each class consisted of 32 students, so the total sample size was 64 students. This arrangement was feasible within the school schedule and preserved the natural classroom setting. The pre-test was administered at the beginning of April 2025, followed by the treatment

phase using Mentimeter or PowerPoint over the next three weeks, and the post-test at the end of May 2025. Purposive sampling was chosen because randomizing students into different classes was not practically or logistically possible due to school policy and fixed class structures.

The reason for selecting purposive sampling and intact classes is grounded in the goal of maintaining ecological validity, i.e., preserving normal classroom dynamics rather than artificially constructing groups. In educational research, intact class design is quite common when random assignment is constrained (Creswell, 2014). Additionally, using two classes of equal size helps reduce variability due to group size, and facilitates balanced comparison between experimental and control groups. Another justification is that previous studies in Indonesia have documented specific writing issues among vocational students in writing analytical exposition texts, indicating that the target group is appropriate for intervention (Dewi Sartika et al., 2023). Furthermore, recent literature shows that tools like Mentimeter enhance student engagement, participation, and learning outcomes in similar settings which supports the choice of Mentimeter for this treatment since engagement is a factor in writing improvement.

D. Research Instrument

The primary instrument utilized in this study is a writing test administered on two occasions: a pre-test and a post-test. Both assessments are designed to evaluate students' ability to produce analytical exposition texts, which constitutes the central focus of this research. The pre-test is administered prior to the treatment to establish students' baseline writing performance and to verify that the experimental and control groups are equivalent at the outset. The post-test is conducted after the treatment sessions to measure any advancement in students' writing skills resulting from instruction using Mentimeter (for the experimental group) and PowerPoint (for the control group). Through the administration of parallel tests before and after the treatment, the researcher is able to compare students' writing

performance over time and evaluate the efficacy of the two distinct instructional media (Creswell, 2014; Sukardi, 2019).

The writing tasks for both the pre-test and post-test are adapted directly from the national English curriculum for vocational high schools to ensure content validity and relevance to the students' learning context. In the pre-test, students are asked to write an analytical exposition text on the topic "The Importance of Learning English in the Digital Era". In the post-test, students are asked to write an analytical exposition text on the topic "Phones Can Be Used as Learning Tools" (see Appendix 1 & 2). Each test requires students to produce approximately 200 words in a structured format that includes a thesis, arguments, and a reiteration. Students are allocated 60 minutes to complete each test, which is consistent with typical classroom writing sessions and provides sufficient time for planning, drafting, and revising their work. By using two different but comparable topics, the tests assess students' ability to apply analytical exposition writing skills to varied subject matter.

To ensure objective assessment of students' writing performance, this study utilizes a standardized scoring rubric adapted from Jacobs et al. (1981), which is presented in Appendix 3. The rubric evaluates five key components of writing: (1) content, (2) organization, (3) vocabulary, (4) language use, and (5) mechanics. Each criterion is rated on a four-point scale ranging from "very poor" to "excellent." The total score is obtained by adding up the scores from all components, with a maximum possible score of 100. Two independent raters will evaluate all student texts to establish inter-rater reliability and reduce potential bias. The application of a detailed rubric along with multiple raters enhances both the reliability and validity of the assessment (Weigle, 2002; Suryani & Utami, 2023). This process ensures that the pre-test and post-test outcomes accurately represent students' writing performance and the effects of the treatment..

E. Treatment Procedure

The research follows three main stages: preparation, implementation, and evaluation (Setyosari, 2021). In the preparation stage, the researcher develops and tests research instruments, selects the population, and determines the sample using purposive sampling. The selected students are divided into an experimental group, which will be taught using Mentimeter, and a control group, which will follow conventional teaching methods.

The implementation stage begins with a pre-test given to both groups to assess their initial writing skills. The experimental group receives instruction with Mentimeter, engaging in interactive activities such as brainstorming, peer feedback, and quizzes, while the control group follows traditional methods. After four treatment sessions, a post-test is conducted to measure any improvements in students' writing performance (Sukardi, 2019).

Table 3 2 Treatment Procedure

Stage	Activity	Experimental Group	Control Group
Pre-Teaching	Pre-activity to activate background knowledge and introduce the lesson topic	The teacher greets students and introduces the topic of analytical exposition texts. The teacher conducts an interactive Mentimeter "Word Cloud" activity to elicit students' ideas and key vocabulary related to the topic "The Importance of Learning English in the Digital Era."	The teacher greets students and introduces the topic of analytical exposition texts. The teacher writes keywords on the board and asks students to brainstorm ideas verbally without using digital tools.
While-Teaching	Main instructional activities focusing on the structure and language features of analytical exposition.	The teacher explains the generic structure (thesis, arguments, reiteration) and language features of analytical exposition texts using interactive Mentimeter	The teacher explains the generic structure and language features of analytical exposition texts using PowerPoint

		slides. Students participate in a Mentimeter quiz about language features (modal verbs, logical conjunctions, and simple present tense). Students collaboratively develop and organize a short draft through the Mentimeter "Collaborative Board" feature.	slides. Students identify examples from the textbook and complete worksheet exercises in groups. Students collaboratively develop and organize a short draft based on the given topic with direct guidance from the teacher.
Post-Teaching	Review and feedback activities to consolidate learning.	Students submit their short drafts through Mentimeter and receive peer and teacher feedback using the Mentimeter Q&A feature. Students revise their drafts based on the feedback received. The teacher highlights several good examples and conducts a short reflection session through Mentimeter.	Students submit their short drafts to the teacher for evaluation. The teacher provides direct feedback and summarizes the lesson using the whiteboard. Students write a short reflection in their notebooks.

The schedule of the reseaarch activities for both the experimental and control group is presented in table 3.3.

Table 3 3 Resarch Schedule

Stage	Experimental Group	Control Group
Pre-Test	April 15th, 2025	April 16th, 2025
Treatment 1	April 22nd, 2025	April 23rd, 2025
Treatment 2	April 29th, 2025	April 30th, 2025
Treatment 3	May 6th, 2025	May 7th, 2025
Treatment 4	May 13th, 2025	May 14th, 2025
Post-Test	May 20th, 2025	May 21st, 2025

F. Data Validity & Reliability

To ensure the quality of the instruments used in this study, both the validity and reliability of the writing test were carefully considered. Validity

in this research refers to content validity, which was established through expert judgment. The researcher submitted the pre-test and post-test instruments to an English teacher and academic supervisor for review. They assessed whether the instrument items were appropriate, clear, and aligned with the curriculum objectives and the characteristics of analytical exposition texts. Based on their feedback, necessary revisions were made to improve the clarity and relevance of the writing tasks. This process ensured that the instrument adequately represents the construct being measured, which is students' analytical exposition writing ability.

Reliability in this study refers to the consistency of the scoring process. To ensure scoring reliability, two raters were involved in assessing the student's writing. Both raters used the same standardized scoring rubric to evaluate the texts based on five aspects: content, organization, vocabulary, grammar, and mechanics. Inter-rater reliability was established by comparing the scores from both raters to ensure consistency in interpretation and application of the rubric criteria. Any significant differences in scoring were discussed and reconciled to maintain objectively and fairness in the assessment process.

G. Data Collection

The data collection procedure of this study was conducted during the even semester of the 2024/2025 academic year at SMKN 2 Kota Kediri, which was selected through purposive sampling. The research was scheduled to take place over approximately four weeks, spanning from April to May 2025. The implementation of data collection comprised three primary stages: pre-test, treatment, and post-test.

At the commencement of the study, both the experimental and control groups were administered a pre-test in the form of analytical exposition writing tasks to assess their baseline writing abilities. Following the pre-test, the experimental group received four treatment sessions utilizing interactive learning media (Mentimeter), whereas the control group was instructed using conventional methods, including textbooks and teacher-led explanations. Each session focused on distinct aspects of

analytical exposition writing, such as structure, linguistic features, the writing process, and peer feedback.

Upon completion of the treatment, a post-test was administered to both groups employing the same format and level of difficulty as the pre-test. The results of the pre-test and post-test were subsequently compared to ascertain the effectiveness of the learning media on students' writing skills. To ensure the reliability of the scoring process, two independent raters evaluated the students' writing using a standardized rubric. The first rater was the researcher, while the second rater was a peer from the English Education Department who possessed sufficient competence in writing assessment. The utilization of two raters was intended to ensure objectivity, consistency, and accuracy in evaluating students' writing performance.

H. Data Analysis

The data obtained from the pre-test and post-test scores of both the experimental and control groups were analyzed using the Mann-Whitney U test. This non-parametric statistical method was chosen because the normality assumption was violated, as indicated by the Shapiro-Wilk test results showing that the data did not follow a normal distribution ($p < 0.05$). Under such circumstances, the use of parametric tests is not recommended, as it may lead to biased or erroneous conclusions. As argued by Field (2018), non-parametric alternatives, such as the Mann-Whitney U test, are more appropriate for comparing two independent groups when the normality assumption is not met. This perspective is further supported by Pallant (2020), who asserts that the Mann-Whitney U test provides a reliable analytical approach for data that depart from a normal distribution, particularly in cases involving small or non-random samples.

The Mann-Whitney U test was performed to determine whether a statistically significant difference existed in the post-test scores between the experimental group, which received instruction using Mentimeter, and the control group, which was taught using PowerPoint. In addition to the inferential analysis, descriptive statistics were also presented to provide a general overview of student performance across both groups. The

significance level was established at $p < 0.05$. A significance value falling below this threshold indicates a meaningful difference between the two groups, thereby suggesting the effectiveness of the treatment. Consequently, if a significant result is obtained, it can be concluded that the use of Mentimeter has a statistically significant effect on students' analytical exposition writing skills.