

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents a comprehensive overview of the research methodology employed in this study. It begins with a detailed explanation of the research design and the selection of research subjects. Furthermore, it elaborates on the research location and time, the sources and types of data utilized, as well as the techniques employed for data collection. The chapter also discusses the research instruments used and outlines the data analysis procedures. In addition, it addresses considerations related to validity and reliability to ensure the rigor of the study and concludes with an examination of the ethical principles adhered to throughout the research process.

3.1 Research Design

This study employs a qualitative research design to explore how ChatGPT disrupts students' writing processes across cognitive, technical, and social dimensions. Qualitative research is appropriate for this inquiry because it emphasizes the exploration of meaning, experiences, and interpretations that individuals assign to a particular phenomenon in a specific context.

According to Creswell (2016), qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. It involves emerging questions and procedures, data collected in the participants' setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data.

In line with this, Denzin and Lincoln (2011) state that qualitative research is inherently interpretive, aiming to understand the subjective perspectives of individuals within their natural settings. Therefore, this study focuses on capturing students' reflections and experiences through open- and closed-ended questionnaires as well as document analysis of their writing outputs.

This design enables the researcher to contextualize insights about how students interact with AI tools especially ChatGPT, and how such tools disrupt the depth and process of student writing.

3.2 Research Subjects

The participants in this study were 20 undergraduate students majoring in English at a private university in Aceh, Indonesia. These students had completed or still follow writing courses and had experience engaging with ChatGPT in various forms. Participants were selected using purposive sampling based on specific inclusion criteria: prior use of ChatGPT in writing assignments, enrollment in writing-focused coursework, and willingness to submit authentic writing samples and complete a semi-structured questionnaire.

From the 20 participants, 9 students (45%) were found to have used ChatGPT in their writing processes, as detected by GPTZero, with AI involvement ranging from 10% to 100%. The remaining 11 students (55%) were categorized as manual writers, with no indication of ChatGPT involvement. This distribution allowed the researcher to examine both user and non-user groups and compare the patterns of disruption across cognitive, technical, and social dimensions.

This purposive strategy ensured relevance and information-rich cases, in line with Dahal et al (2024) emphasis on selecting participants who can provide deep insight into the research questions. The diversity in usage levels made it possible to capture a range of perspectives and writing outcomes associated with the integration of AI in writing tasks.

3.3 Research Location and Time

This study was conducted in March- June 2024 at a private university in Aceh, Indonesia. Data were collected both onsite and remotely, depending on participant accessibility. The flexibility of location was designed to make participants more comfortable during questionnaire completion and document sharing, enhancing the authenticity of the data.

3.4 Sources and Types of Data

Primary data in this study were obtained through two types: document analysis and a semi-structured questionnaire. First, student essays were purposefully collected for the research and analyzed to evaluate the involvement and disruption of ChatGPT on writing ability, focusing on aspects such as writing authenticity, content, grammar, vocabulary, and mechanics. Second, a semi-structured questionnaire designed and distributed by the researcher was used to explore students' perceptions of ChatGPT use across cognitive, technical, and socio-ethical dimensions. The combination of these instruments provided comprehensive insights into both the observable quality of student writing and their subjective experiences and challenges.

3.5 Data Collection Techniques

Data collection in this study employs qualitative techniques, both categorized as primary data sources. The researcher utilized two main instruments: document analysis and a semi-structured questionnaire.

First, document analysis was conducted on student paragraph that were purposefully written for this research. These documents were analysed using multiple layers of evaluation. GPTZero was employed to detect the degree of ChatGPT involvement, and an adapted analytic rubric was applied to evaluate four key dimensions of writing ability: grammar, vocabulary, mechanics, and content.

Second, a semi-structured questionnaire consisting of both closed- and open-ended questions was distributed to twenty English undergraduate students. The questionnaire was designed to collect perceptions related to the cognitive, technical, and socio-ethical disruptions caused by ChatGPT use in academic writing. The questionnaire instrument was adapted from several relevant studies, including Artiana & Fakhurriana (2024), Rahma & Fithriani (2024), and Marzuki et al. (2023), ensuring both contextual relevance and validity.

The integration of these two instruments allowed the researcher to obtain a comprehensive understanding of the disruptions caused by ChatGPT capturing both measurable changes in writing quality and the subjective experiences of the students.

3.6 Research Instruments

This study employed two primary research instruments designed to collect qualitative data directly from participants. The first instrument was a semi-structured questionnaire comprising 20 Likert-scale items. These items were categorized into three thematic dimensions: cognitive, technical, and socio-ethical aspects of disruption caused by ChatGPT. The questionnaire format allowed for structured quantification while also providing space for participants to elaborate on their experiences and opinions, thus ensuring both breadth and depth of response (Bryman, 2016). The design of the questionnaire was adapted and refined based on prior validated instruments used in studies by Artiana & Fakhurriana (2024), Rahma & Fithriani (2024), and Marzuki et al. (2023).

The second instrument was an analytic scoring rubric used to assess the quality of student-written essays. This rubric was adapted from established frameworks developed by Rukmini & Saputri (2017) and Wilson (2020), and it measured four key components of academic writing ability: content, grammar, vocabulary, mechanics, and authenticity. The rubric was applied systematically to each essay to provide a consistent and objective evaluation of students' writing ability, both with and without ChatGPT assistance.

These two instruments enabled the researcher to conduct a comprehensive analysis by triangulating students' subjective perceptions and the measurable outcomes reflected in their writing ability.

3.7 Data Analysis Techniques

Researchers analysed the data by focusing on the disruption caused by ChatGPT on students' writing ability, as revealed through two primary instruments: document analysis and close and open-ended questionnaire. This mixed-method approach enabled both objective evaluation and subjective interpretation of the phenomenon under study.

a. Document Analysis

The analysis began with an in-depth review of student writing samples, which were evaluated using GPTZero, Grammarly, and a rubric based assessment. GPTZero was employed to assess the actual quality and characteristics of student writing, do they prefer to use ChatGPT or not. Meanwhile, rubric based assessment was adapted from established frameworks developed by Rukmini & Saputri (2017) and Wilson (2020), the rubric was constructed to evaluate five critical components of writing: Content, Vocabulary, Grammar, and Mechanics. Each component was scored on a 1–5 scale with clearly defined indicators, as shown below:

Scoring Rubric for Writing Assessment			
Component of writing	Score	Level	Indicators
Writing Authenticity	5	Very Original	Original, highly creative, and unique expression.
	4	Original	Mostly original, some predictable ideas
	3	Fairly Original	Fairly original, occasionally relies on common expressions
	2	Less Original	Limited originality, mostly predictable
	1	Not Original	Not original, largely copied or unoriginal ideas.
Content	5	Excellent	Highly relevant, clearly addresses the topic, thorough development
	4	Very Good	Mostly relevant, clear focus, well-developed ideas.

	3	Good	Generally relevant, some unclear or off-topic sections.
	2	Fair	Partially relevant, limited development, often unclear.
	1	Poor	Not relevant, lacks clear focus or development.
Vocabulary	5	Excellent	Precise, varied, contextually appropriate word choice
	4	Very Good	Mostly precise, minor awkward phrasing
	3	Good	Adequate but occasionally inappropriate
	2	Fair	Limited range, frequent awkward or inappropriate choices.
	1	Poor	Basic or inappropriate vocabulary, significantly affects clarity.
Grammar	5	Excellent	Minimal or no errors, varied sentence structures, overall Grammarly score $\geq 95\%$.
	4	Very Good	Few minor errors, clear and mostly accurate, overall Grammarly score 85-94%.
	3	Good	Moderate errors, occasionally unclear, overall Grammarly score 75-84%.
	2	Fair	Frequent errors, often unclear, overall Grammarly score 60-74%.
	1	Poor	Numerous and severe errors, unclear communication, overall Grammarly score $< 60\%$.
Mechanics (Spelling, Punctuation, Capitalization)	5	Excellent	Accurate throughout, no significant errors detected.
	4	Very Good	Few minor errors, generally clear.
	3	Good	Some errors, occasionally affects understanding.
	2	Fair	Frequent errors, often disrupts comprehension.
	1	Poor	Numerous and serious errors, severely affects readability.

$$\text{Final Score: } \frac{3C + 2.5V + 2.5G + 2M}{40} \times 100$$

b. Questionnaire Analysis

Following the document analysis, the questionnaire data comprising both close- and open-ended items were analyzed through a multi-stage process, tailored to accommodate qualitative data formats.

As for responses from the close-ended items were analyzed using descriptive statistics via SPSS version 25. The mean (average) scores were calculated for each item to measure students' overall tendencies in the cognitive, technical, and socio-ethical aspects of ChatGPT usage. The result of mean score of participants were interpreted using the five-point Likert Scale classification from Pimentel (2010), as follows:

<i>Adjectival Rating Interpretation</i>	
Interval	Adjectival Rating
1.00-1.75	Never
1.76-2.51	Rarely
2.51-3.27	Fairly Often
3.28-4.00	Very Often

Furthermore, Categorical questionnaire responses such as yes/no or multiple-choice items were examined through frequency and percentage calculations to observe the proportion of students who selected particular responses. This provided a clearer picture of patterns such as the level of AI dependency or ethical concerns.

Meanwhile, qualitative responses from the open-ended items questionnaire were transcribed and coded. These responses were then analyzed using thematic analysis, in accordance with Braun and Clarke's (2006) six-step framework: (1) familiarization with the data, (2) generating initial codes, (3)

searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. This allowed the researcher to identify recurring themes and deeper insights into students' subjective experiences with ChatGPT, including their motivations, concerns, and reflections.

By combining these approaches, the researcher was able to integrate both statistical trends and personal narratives, offering a comprehensive interpretation of how ChatGPT disrupt student writing both in measurable outcomes and lived experience.

3.8 Validity and Reliability

To ensure validity, the researcher applied data triangulation from multiple instruments including questionnaire responses, document analysis, and rubric-based writing assessments and member checks by verifying interpretations with participants. Reliability was achieved by following a consistent research procedure and maintaining transparency in scoring processes, these steps ensure that the research findings are both trustworthy and verifiable.

3.9 Research Ethics

This study strictly adhered to ethical research principles. Informed consent was obtained from all participants before data collection. Anonymity and confidentiality were maintained in handling responses and documents. The use of ChatGPT was transparently discussed, including limitations and ethical implications.