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Dependence on the Use of ChatGPT and Its Impact on Statistics Students' Linguistic Literacy in Compiling Data Analysis Reports

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ABSTRACT

The rapid development of generative artificial intelligence, particularly ChatGPT, has significantly influenced higher education, especially in student academic writing activities. However, research specifically examining the relationship between ChatGPT dependency and student language literacy in preparing data analysis reports remains limited. This study aimed to analyze the relationship between dependency on ChatGPT usage and the language literacy of Statistics students in preparing data analysis reports. A quantitative approach with a survey strategy was employed. The population consisted of 265 active Statistics students at Universitas Negeri Medan from the 2023, 2024, and 2025 cohorts, with 66 respondents selected through purposive sampling. Data were collected using a digital questionnaire via Google Forms, measuring ChatGPT dependency (7 items) and language literacy (6 items) on a 4-point Likert scale. Descriptive statistical analysis and Pearson correlation tests were conducted using RStudio. The results showed that ChatGPT dependency was in the Agree category (mean = 2.70), with students demonstrating selective use by disagreeing with directly copying AI output (1.91). Language literacy was also in the Agree category (mean = 2.98), although confidence in independent writing remained low (2.62). The Pearson correlation test revealed no significant relationship between ChatGPT dependency and language literacy ($r = -0.002$; $p = 0.9903 > 0.05$). The study concludes that AI dependency does not inherently weaken language literacy, and educational efforts should focus on critical AI usage rather than prohibition.

Keywords: ChatGPT dependency, language literacy, generative artificial intelligence, academic writing, Statistics students.

1. INTRODUCTION

The development of artificial intelligence technology based on generative AI has brought significant changes to higher education, particularly in student academic activities. The presence of ChatGPT has become one of the digital innovations widely used in information retrieval, assignment preparation, and academic report writing. This technology allows users to obtain writing assistance quickly and interactively through natural language processing. According to OpenAI, ChatGPT is designed to help users generate text, answer questions, and support language-based activities. The use of ChatGPT in education is known to help students understand learning materials and improve the efficiency of completing academic assignments (Erizal et al., 2024). ChatGPT can also assist the scientific writing process by structuring the writing, developing ideas, and improving academic sentences (Munawar et al., 2023).

The utilization of ChatGPT in academic environments has raised various concerns regarding its impact on student literacy, particularly language literacy in scientific writing. Students currently tend to use ChatGPT to help compose sentences, summarize materials, and even interpret data analysis results. This ease of use provides benefits in increasing academic productivity but also raises concerns about the emergence of dependency on AI. Excessive use of ChatGPT has the potential to reduce student creativity and academic integrity because independent thinking processes diminish (Mahama et al., 2023). Uncontrolled AI use can also cause students to rely more on instant

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results than on developing their independent writing skills (Marlin et al., 2023). Research by Elfayetti et al. (2025) found that ChatGPT usage is known to influence student literacy patterns in the learning process.

Statistics study program students have academic characteristics closely related to data processing, interpretation of analysis results, and systematic preparation of statistical reports. Language literacy skills are necessary for students to be able to convey data analysis results clearly, logically, and scientifically. The use of ChatGPT in preparing data analysis reports can help students compose research result narratives more quickly and in a more structured manner. However, overly intensive use is feared to reduce students' ability to compose academic sentences independently.

Previous research has generally focused on the benefits of using ChatGPT in education, student perceptions of AI, and its influence on the learning process. Research on the utilization and perceptions of students toward ChatGPT has been conducted by Aswidani (2025), while the strategies and challenges of using generative AI in academic writing were discussed by Thalib & Mansyur (2025). The use of digital-based AI such as ChatGPT and Gemini is also known to help improve grammar in student academic writing (Husna et al., 2026). The results of these studies indicate that ChatGPT has positive potential in supporting student academic activities. However, research that specifically connects the level of dependency on ChatGPT usage with student language literacy in preparing data analysis reports remains relatively limited. The existing literature has not adequately addressed whether AI dependency correlates with fundamental academic skills or whether students maintain critical thinking abilities while using these tools. Targeted use of ChatGPT can also support the improvement of academic writing skills by providing examples of writing structures and language corrections (Suhendi, 2025).

The urgency of this research lies in the importance of understanding the extent to which dependency on ChatGPT usage can affect student language literacy abilities. Academic writing ability is one of the main competencies in higher education that functions not only to convey information but also to reflect students' critical thinking abilities. Unbalanced AI use is feared to cause students to lose the ability to construct arguments and interpretations independently. The increasingly rapid development of generative AI means this technology is becoming part of students' daily academic activities. Understanding the impact of ChatGPT usage on language literacy is crucial so that technology utilization continues to support the learning process without reducing students' basic academic abilities.

This study aims to analyze the relationship between dependency on ChatGPT usage and the language literacy of Statistics students in preparing data analysis reports. The novelty of this research lies in its focus on connecting the level of AI usage dependency with the language literacy abilities of Statistics students across cohorts at Universitas Negeri Medan. This research is expected to provide theoretical contributions to the development of academic literacy studies in the generative AI era. This research is also expected to broaden understanding of the impact of digital technology use on student language abilities. The practical benefits of this research are expected to help students use ChatGPT wisely and proportionally in their academic activities.

2. RESEARCH METHOD

This study applied a quantitative research approach with a survey strategy. This approach was used to describe the extent to which students depend on ChatGPT and their level of language literacy, as well as to examine the relationship between these two variables.

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2.1 Population and Sample

The population in this study consisted of all active students in the Statistics Study Program at Universitas Negeri Medan from the 2023, 2024, and 2025 cohorts, totaling 265 students. A total of 66 respondents were selected as the sample using a purposive sampling technique. The criteria used in this study included:

1. Active students from the 2023 to 2025 cohorts
2. Had used ChatGPT at least three times in the past month
3. Willing to complete the questionnaire fully

This sample size of 66 respondents represents approximately 24.9% of the total population, in accordance with the recommendation of Hendrajaya & Lestari (2022). The details of the respondent characteristics collected were 43 female students (65.2%) and 23 male students (34.8%). Based on semester, 16 respondents came from semester 2, 34 respondents from semester 4, and 16 respondents from semester 6.

2.2 Research Instrument

The data collection tool used was a digital questionnaire via Google Forms, divided into three parts. Part A contains information about respondent characteristics, namely gender and semester, part B measures the variable of dependency on ChatGPT (X), consisting of 7 question items (X1 to X7), and part C measures the variable of language literacy (Y), consisting of 6 question items (Y1 to Y6). Score 1 in the category strongly disagree, score 2 in the category disagree, score 3 in the category agree, score 4 in the category strongly agree. The selection of a 4-point scale without a neutral option aimed to prevent respondents from tending to choose a safe middle answer.

2.3 Data Collection Technique

The questionnaire was distributed online through the official WhatsApp groups of each cohort (2023, 2024, and 2025) as well as through private messages over a period of 7 days. All 66 respondents filled out the questionnaire voluntarily and anonymously. All collected data were declared complete and met the requirements for further analysis.

2.4 Data Analysis Technique

The data analysis process was conducted using RStudio software through the following three stages:

a. Descriptive Statistical Analysis

Descriptive statistical analysis was used to calculate frequency distribution, percentage of respondent characteristics, and the mean value for each statement item. The formula used to calculate the mean was:

$$\bar{X} = \frac{\sum X_i}{n}$$

The mean values obtained were then interpreted based on the following categories:

Table 1. Range and Category

Range	Category
1.00 – 1.75	Strongly Disagree
1.76 – 2.50	Disagree
2.51 – 3.25	Agree
3.26 – 4.00	Strongly Agree

b. Pearson Correlation Test

To test whether there was a relationship between the level of dependency on ChatGPT (X) and the level of language literacy (Y), the Pearson correlation test was used with the help of RStudio.

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Hypothesis testing was conducted with a significance level of 5% ($\alpha = 0.05$). The research hypotheses were formulated as follows:

- **H_0:** There is no significant relationship between dependency on ChatGPT usage and language literacy among Statistics students.
- **H_1:** There is a significant relationship between dependency on ChatGPT usage and language literacy among Statistics students.

Test Criteria:

- If the p-value ≥ 0.05, then H_0 is accepted.
- If the p-value < 0.05, then H_0 is rejected (H_1 is accepted).

c. Data Presentation

The analysis results were presented in the form of frequency distribution tables, mean value tables for each statement item, as well as the correlation coefficient (r) and p-value.

3. RESULT AND DISCUSSION

The total number of Statistics students was 265. According to Hendrajaya & Lestari (2022), if the number of subjects is less than 100, the entire population becomes the study sample. However, if the number exceeds 100, one may choose 10-15% or 15-25%. Based on this definition, this analysis involved 66 respondents.

3.1 Respondent Characteristics

Table 2. Respondent Characteristics by **Gender**

Gender	**Frequency**	**Percentage**
Female	43	65.2%
Male	23	34.8%
100%	100%	100%

The characteristics of respondents by gender show that out of 66 students participating in this study, the majority were female, with 43 students (65.2%), while male students numbered 23 (34.8%). This composition reflects the general condition of the Statistics Study Program, which is traditionally dominated by female students. The questionnaire results also showed that 16 respondents came from 2nd-semester students, 34 respondents were from the 4th semester, and 16 respondents were from the 6th semester. This indicates that intermediate-level students (semesters 4 and 6) were the dominant group in this study, and they are also the group that most frequently receives data analysis assignments.

3.2 Analysis of ChatGPT Dependency Level

This analysis was conducted using RStudio, where the research instrument was analyzed to find the mean value. To analyze the level of student dependency on ChatGPT, a Likert scale of 1-4 was used:

- 1.00 - 1.75 : Strongly Disagree
- 1.76 - 2.50 : Disagree
- 2.51 - 3.25 : Agree
- 3.26 - 4.00 : Strongly Agree

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The results of the analysis are as follows:

Table 3. Mean Scores for **ChatGPT** Dependency (X)

Code	Statement	Mean	Category
X1	I often use ChatGPT	3.14	Agree
X2	I find it difficult without ChatGPT	2.68	Agree
X3	I directly use ChatGPT results without revision	1.91	Disagree
X4	I trust ChatGPT more than my own ability	2.15	Disagree
X5	I use GPT to improve language structure	2.98	Agree
X6	GPT makes assignments easier	3.35	Strongly Agree
X7	Without GPT, the process is more difficult	2.71	Agree

The overall mean score is 2.70, which means that Statistics students agree that ChatGPT is frequently used, makes work easier, helps improve language structure, and that they depend on ChatGPT. However, students also show a critical attitude by disagreeing with directly copying ChatGPT results and disagreeing that ChatGPT is better than their own writing skills. In other words, student dependency on ChatGPT is functional and selective. They use ChatGPT as a tool for efficiency and language improvement, but without losing confidence in their own abilities.

3.3 Analysis of Language Literacy Level

The same analysis was performed in RStudio to find the mean value for each language literacy instrument, yielding the following:

Table 4. Mean Scores for Language **Literacy** (Y)

Code	Statement	Mean	Category
Y1	Understanding Indonesian language rules	3.05	Agree
Y2	Able to distinguish effective/ineffective sentences	3.00	Agree
Y3	Able to correct grammatical errors	2.98	Agree
Y4	Understanding the use of punctuation	3.12	Agree
Y5	Able to adapt GPT results to scientific language	3.11	Agree
Y6	Able to write without GPT assistance	2.62	Agree

The average language literacy score is 2.98 on a scale of 1-4, which falls into the Agree category. The highest scores were for "Understanding the Use of Punctuation" at 3.12 and "Able to adapt ChatGPT results" at 3.11, indicating that students have a good understanding of punctuation and can adapt ChatGPT outputs to a scientific writing style. Meanwhile, the lowest score was for the last item at 2.62, indicating that students still lack confidence in writing data analysis reports without ChatGPT assistance. Overall, Statistics students have fairly good language literacy, but their confidence in independent writing still needs improvement.

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3.4 The Relationship Between GPT Dependency and Language Literacy

To determine whether there is a relationship between GPT dependency (X) and language literacy (Y), a Pearson correlation test was performed. Before conducting the correlation test, the following hypotheses were formulated:

- **H_0:** There is no significant relationship between dependency on ChatGPT usage and language literacy among Statistics students.
- **H_1:** There is a significant relationship between dependency on ChatGPT usage and language literacy among Statistics students.

Test Criteria:

- If p-value ≥ α (0.05), then H0 is accepted.
- If p-value < α (0.05), then H0 is rejected.

This criterion aligns with Pearson correlation testing procedures, where the decision to accept or reject H0 is based on comparing the p-value with the predetermined significance level (Shieh, 2021).

Table 5. Pearson **Correlation** Results

Variable Relationship	Correlation Coefficient (r)	p-value	Decision
GPT Dependency (X) vs. Language Literacy (Y)	-0.002	0.9903	H0 Accepted

The Pearson correlation test showed that the correlation coefficient between GPT dependency (X) and language literacy (Y) is r = -0.002 with a p-value = 0.9903. Because the p-value > 0.05, H0 is accepted. Thus, there is no significant relationship between dependency on GPT and the language literacy of Statistics students. The strength of the relationship is very weak (r close to 0). The negative direction (-0.002) is statistically negligible as it approaches zero. This means that the level of student dependency on GPT does not affect their language literacy.

3.5 Research Gap and Discussion

The results of this study fill an important gap in the existing literature. While much research has focused on the positive or negative impacts of AI on academic performance (e.g., Warschauer et al., 2019; Fitria, 2021), few studies have specifically examined whether AI dependency correlates with fundamental academic skills like language literacy. Many educators fear that reliance on ChatGPT may erode students' basic writing abilities. However, this study provides empirical evidence to the contrary: dependency on ChatGPT does not significantly correlate with lower language literacy (r = -0.002; p = 0.9903).

This finding contradicts the assumption that using AI tools automatically weakens students' linguistic competence. Instead, it supports the view of Zhai (2022) that AI can function as a "cognitive partner" without replacing core skills. The results show that students are selective users: they disagree with directly copying ChatGPT output (mean 1.91) and disagree that ChatGPT is superior to their own writing ability (mean 2.15). This critical attitude aligns with the concept of "AI literacy" proposed by Long & Magerko (2020), where effective AI use requires understanding and critical evaluation rather than passive acceptance.

Furthermore, the mean language literacy score (2.98) indicates that students possess sufficient foundational knowledge to evaluate and edit AI-generated content. The lowest language literacy item—confidence in writing without GPT (2.62)—suggests a psychological dependency rather than a skill deficit. This distinction is crucial: students *can* write independently but lack *confidence*. Therefore, the research gap is filled by demonstrating that functional dependency on AI does not equate to skill erosion, and that pedagogical interventions should focus on building self-efficacy rather than restricting AI access.

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CONCLUSION

This This study demonstrates that Statistics students at Universitas Negeri Medan exhibit a moderate yet selective dependency on ChatGPT in preparing data analysis reports. Students generally use ChatGPT as an academic support tool to improve language structure, generate ideas, and simplify assignments rather than as a substitute for their own abilities. This finding is reflected in the students' disagreement with directly copying AI-generated outputs and their continued confidence in their personal writing skills. In addition, the level of language literacy among students was found to be relatively good, particularly in understanding punctuation, sentence effectiveness, and adapting AI-generated content into scientific language.

The Pearson correlation analysis further revealed that there is no statistically significant relationship between dependency on ChatGPT and students' language literacy abilities. This indicates that the use of generative AI does not automatically reduce linguistic competence or academic literacy. Instead, the findings suggest that ChatGPT can function as a complementary educational tool when students maintain critical thinking and active engagement during the writing process.

The implications of this study are important for higher education institutions, educators, and students. Universities should not focus solely on restricting AI use, but rather on integrating AI literacy into academic learning. Students need to be trained to evaluate, revise, and critically interpret AI-generated information responsibly. Moreover, future research is recommended to involve larger and more diverse samples across disciplines, apply qualitative approaches such as interviews or observations, and investigate the long-term effects of AI-assisted writing on academic literacy development.

Overall, this study confirms that the integration of artificial intelligence into academic writing does not necessarily threaten students' language literacy. Instead, the effective and critical use of AI may coexist with the development of essential academic competencies in the era of digital education.

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