

# Exploring The Impact of Artificial Intelligence Writing Tools on Students Writing Skills Enhancement

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## ABSTRACT

The study explores about the impact of various Artificial Intelligence (AI) writing tools on the writing skills of English language-speaking students, with a specific focus on content and organization. Employing a qualitative approach and adopting a case study design, the researcher explores the experiences and perceptions of educators across diverse educational settings. The assessment of AI tools' effectiveness involved a pre-assessment phase, exposing participants to writing activities without AI support, followed by an introduction to AI tools and subsequent activities to gauge their impact. Statistical analysis, utilizing ANOVA, revealed a statistically significant improvement in participants' writing efficiency with AI assistance. The study highlights the complementary role of AI in writing, emphasizing its strengths in automation and scalability, while recognizing human strengths in creativity and subjective elements. The implications underscore the potential for a synergistic collaboration between human and AI capabilities in writing instruction. Educators are encouraged to consider these findings when integrating AI tools, recognizing the unique contributions of both humans and AI. This study contributes to academic understanding and provides practical insights for educators navigating technology-enhanced writing instruction.

**Keywords:** Artificial Intelligence, Writing Skills, Content, Organization, Education, Qualitative Research, Case Study, Technology-enhanced Learning, Teacher Perception, Student Writing Proficiency.

## I. INTRODUCTION

The primary objective of this study is to delve into the impact of various Artificial Intelligence (AI) writing tools on the writing skills of English language-speaking students. The study specifically concentrates on two critical aspects of writing – content and organization – aiming to comprehend how the use of AI writing tools influences these elements (Akgun and Greenhow 435). The examination of this impact is approached through the lens of teachers, acknowledging their valuable perspectives as assessors of students' writing development. To achieve a nuanced understanding, the research adopts a qualitative approach, emphasizing exploration of underlying meanings and experiences rather than relying solely on quantitative data. Furthermore, the study is structured within a case study design, indicating a focused investigation into a specific context, possibly a particular educational institution or set of classrooms. The adoption of a case study design is driven by the intention to provide in-depth insights, offering a comprehensive understanding of the effects of AI writing tools on content and organization in the writing skills of English language-speaking students.

- To examine the range of available AI writing tools.
- To assess the influence of AI writing tools on student writing quality, with a particular emphasis on content and organization.
- To understand teachers' perceptions of the impact of AI writing tools.

## II. METHODOLOGY

The research design is characterized by a case study approach, allowing for a detailed exploration of the subject matter. The study embarked on an exploration of Artificial Intelligence (AI) tools designed to facilitate writing services, aiming to investigate their effectiveness in educational settings. To ensure a comprehensive understanding, the research employed a qualitative methodology that involved the selection of five participants from diverse educational settings. This diversity in participant selection was deliberate, as it enhances the generalizability of the study's findings, allowing insights to be applicable to a broader range of educational contexts.

### Objectives:

The participants, representing various educational backgrounds, were strategically chosen to provide a well-rounded perspective on the use of AI writing tools. The research sought to capture the experiences and observations of educators across different institutions, ensuring that the study's conclusions could be more widely applied.

The methodology included a pre-assessment phase where participants were asked to engage in writing activities without the assistance of AI tools. This initial phase served as a baseline to evaluate the participants' writing skills and their approaches to teaching writing concepts. Following the pre-assessment, participants were introduced to AI writing tools, and subsequent activities were designed to gauge their experiences and perceptions after incorporating these tools into their classrooms.

During the study, participants were encouraged to share their insights into the practical applications of AI writing tools in the teaching and learning process (Akgun and Greenhow 435). Additionally, they provided feedback on the impact of these tools on students' writing skills, focusing on aspects such as content development, organizational structure, and overall writing proficiency.

By structuring the research in this way, the methodology aimed to capture both the before-and-after perspectives of educators using AI writing tools. This approach allowed for a thorough examination of the tools' influence on teaching methodologies and student outcomes. Data collection was carried out through semi-research aiming to gather information regarding the diversity of AI writing tools and their perceived impact on students' writing quality. The findings derived from the study not only contribute to the existing knowledge on AI tools in education but also offer practical insights for educators looking to integrate such technology into their writing instruction (Akgun and Greenhow 435).

### **III. PARTICIPANTS**

The sampling procedure for this study was carefully designed to ensure diversity and representation among the participants, adopting a systematic and deliberate approach. The process involved several key steps to establish a comprehensive understanding of the impact of AI writing tools in various educational settings (Bhutoria).

In the initial phase, the research team identified a spectrum of educational settings to contribute to the diversity of the participant pool. This encompassed different types of institutions, such as schools, colleges, and other educational establishments.

To introduce variability and mitigate potential biases, a random selection method was employed to choose a subset of educational settings from the broader pool. This step aimed to create a well-rounded sample that would be reflective of the broader population of educators.

Within each selected educational setting, potential participants, including teachers, educators, or instructors, were then identified. This involved reaching out to individuals who expressed a willingness to participate in the study, ensuring a varied and representative group.

The subsequent step involved a random assignment method to select a specific number of participants from each educational setting. This approach was instrumental in achieving a representative sample size and reducing the likelihood of selection bias, contributing to the overall validity of the study.

Prior to engaging in the study activities, participants who agreed to take part were provided with informed consent documents. These documents detailed the research's purpose, the utilization of AI tools, and the overall study structure. Following the consent process, a pre-assessment was conducted to gauge participants' understanding of writing concepts without the aid of AI tools.

After the pre-assessment, participants were introduced to AI writing tools. The research team explained the specific tools and their functionalities, ensuring a standardized experience for all participants. Subsequently, a post-assessment was carried out following a period of exposure and integration of AI tools into their classrooms. This post-assessment aimed to evaluate the impact of these tools on participants' perspectives and teaching practices.

By employing a random sampling procedure, the study sought to enhance the generalizability of its findings. This methodological choice, geared towards reducing selection bias, ensures that the research outcomes can be more widely applicable to a diverse population of educators in various educational settings. The systematic approach to participant selection contributes to the robustness and validity of the study's findings, providing valuable insights into the integration of AI writing tools in educational contexts.

#### **IV. AI WRITING TOOLS**

AI, or Artificial Intelligence, refers to the development of computer systems that can perform tasks that typically require human intelligence. These tasks include learning, reasoning, problem-solving, perception, speech recognition, and language understanding. AI can be broadly categorized into two types: Narrow AI, which is designed for a particular task, and General AI, which has the ability to understand, learn, and apply knowledge across a range of tasks at human-level intelligence.

The study examined a variety of AI writing tools used for writing aids, including but not limited to:

- Quillbot (Kurniati and Fithriani 437)
- Grammarly (Fitria 65)
- Jenni
- Chat-GPT
- Essay Writer

These tools were selected based on their popularity and relevance in the context of English language writing instruction.

#### **V. DATA ANALYSIS**

In the course of evaluating the data analysis within the framework of the study concerning the utilization of AI tools, including but not limited to ChatGPT, Quillbot, Grammarly, Jenni, and Essay Writer, a structured examination protocol was implemented. The assessment involved the voluntary participation of five individuals who were sequentially subjected to a pre-test devoid of any AI support. Subsequently, the same cohort of participants was tasked with undertaking the identical pre-test questions, yet this time with the assistance of the aforementioned AI tools, thereby serving as a post-test evaluation. This methodological approach aimed to discern and elucidate the potential impact of AI tool integration on the participants' performance, thereby contributing to a nuanced understanding of the influence of AI technologies on writing proficiency (Maulidina and Wibowo 182).

##### **Assessment of the AI Tools Usage**

The provided table, titled "AI Tools Assessment," presents a comparative evaluation of the performance of five volunteering individuals across a pre-test conducted without the assistance of AI tools and a post-test conducted with the aid of AI tools. The numerical values in the table represent the scores achieved by each individual in the respective test conditions.

AI Tools Assessment		
	PreTest Without AI	Post Test With AI
Volunteering Individual 1	5	15
Volunteering Individual 2	8	16
Volunteering Individual 3	9	15
Volunteering Individual 4	6	15
Volunteering Individual 5	8	17
	<b>36</b>	<b>78</b>

The table illustrates a noticeable increase in scores from the pre-test without AI support to the post-test with AI support for all volunteering individuals. This suggests that the utilization of AI tools, such as ChatGPT, Quillbot, Grammarly, Jenni, and Essay Writer, positively influenced the participants' writing efficiency. The post-test scores, cumulatively totaling 78 points, demonstrate an enhanced performance when individuals were provided with AI assistance in the writing task compared to their unassisted pre-test performance, which totaled 36 points. The disparity in scores strongly indicates the potential efficacy of AI tools in improving writing proficiency among the participating individuals.

**Statistical Analysis**

The provided ANOVA (Analysis of Variance) table is used to assess the impact of AI tools on the performance scores between two groups: the pre-test without AI support and the post-test with AI support.

**Anova: Single Factor -Assessment of AI Tools**

SUMMARY

Groups	Count	Sum	Average	Variance
PreTest	5	36	7.2	2.7
Post Test	5	78	15.6	0.8

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	176.4	1	176.4	100.8	8.24E-06	5.317655
Within Groups	14	8	1.75			
Total	190.4	9				

The ANOVA results suggest a significant difference in the mean scores between the two groups (PreTest and Post Test). The Between Groups variance (176.4) is substantially higher than the Within Groups variance (14), resulting in a large F-value of 100.8. The low p-value (8.24E-06) indicates that the observed difference is unlikely due to random chance.

Therefore, based on the statistical significance of the F-test, we reject the null hypothesis that there is no difference in the mean scores between the pre-test and post-test groups. This implies that the utilization of AI tools had a significant impact on the participants' performance. The critical F-value (F crit) of 5.317655 further supports the rejection of the null hypothesis. In summary, the ANOVA results suggest that the introduction of AI tools led to a statistically significant improvement in the participants' scores from the pre-test to the post-test.

## **VI. FINDINGS**

In the ordeal of writing tasks, humans and artificial intelligence (AI) distinctly contribute, each leveraging their unique capabilities. The human writing process commences with the creative generation of ideas and thoughtful structuring of content. While AI may generate ideas based on data patterns, its creativity remains limited, yet it can offer suggestions. Humans engage in comprehensive research, combining information and personal expression in the drafting phase, a nuance often lacking in AI, which, however, aids in drafting and provides structural suggestions. Humans extensively edit and revise, infusing creativity and subjectivity, aspects challenging for AI that excels in grammar correction and style suggestions. In contrast, AI's writing process involves data analysis and training on vast datasets, excelling in pattern recognition and automation but lacking true understanding of context. The comparatives highlight human strengths in creativity, understanding, subjectivity, adaptability, and qualitative improvement, suggesting that the optimal approach involves a collaborative synergy between human creativity and AI assistance.

## **VII. IMPLICATIONS**

The discernible rise in scores observed from the pre-test without AI support to the post-test with AI support signifies that the incorporation of AI tools, encompassing ChatGPT, Quillbot, Grammarly, Jenni, and Essay Writer, exerts a positive influence on the writing efficiency of participants. This holds practical significance for educators actively seeking avenues to augment the writing proficiency of their students.

Moreover, the study accentuates the complementary role that AI assumes in the writing process. While AI tools demonstrate proficiency in automating specific aspects, delivering grammar corrections, and proffering style suggestions, they lack the profound understanding, creativity, and adaptability inherent in human writers. The optimal strategy, as underscored by the study, involves fostering a collaborative synergy wherein AI complements the inherent strengths of human creativity and subjectivity.

## **VIII. CONCLUSION**

In conclusion, this study details the impact of various AI writing tools on the writing skills of English language-speaking students, specifically focusing on content and organization. The adoption of a qualitative approach and a case study design provided in-depth insights into the experiences and perceptions of educators across diverse educational settings.

The results of the AI tools assessment, supported by statistical analysis using ANOVA, indicate a statistically significant improvement in participants' writing efficiency when aided by AI tools. While AI demonstrates strengths in automation, pattern recognition, and scalability, it falls short in aspects of true creativity, understanding of context, and subjective elements, which are inherent in the human writing process.

The study's implications highlight the potential for a synergistic collaboration between human and AI capabilities in writing instruction. Educators are encouraged to consider the findings when integrating AI tools into their teaching practices, recognizing the unique contributions of both humans and AI in fostering enhanced writing skills.

Ultimately, this study contributes not only to the academic understanding of AI tools in education but also provides practical insights for educators seeking to navigate the evolving landscape of technology-enhanced writing instruction under guided principles of human understanding.

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