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ARTIFICIAL INTELLIGENCE (AI) OR INTELLIGENT ASSISTANCE (IA)? PEDAGOGICAL IMPLICATIONS OF AI INTEGRATION IN ESL ACADEMIC WRITING CLASSES

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Abstract

The rise of Artificial Intelligence (AI) has influenced and reshaped nearly every aspect of social life, and with its widespread and heightened fame, has brought both positive and negative impacts. In the education sector, particularly in academic contexts, AI has transformed teaching and learning practices. At one extreme, it is glorified for its potential, while at the other, it is considered destructive because it encourages malpractice in academia. In this regard, empirical evidence on AI's potential to assist or harm is necessary; therefore, this quasi-experimental study adopted a mixed-methods research design to explore the impact of AI integration on the academic writing skills of English as a Second Language (ESL) learners. The experimental group was taught using an AI intervention, while the control group received a traditional instructional treatment. Quantitative data from the experimental group's pre-test and post-test revealed significant improvement in ESL learners' writing scores as compared to the control group. The findings from qualitative data suggest a positive impact of AI on academic writing classes, including increased learner engagement, autonomy, and overall proficiency. In contrast, the control group showed greater reliance on teacher feedback and peer interaction, with lower learner autonomy. The results highlight that AI intervention in writing instruction can enhance pedagogical value by complementing traditional teaching methods and promoting learner autonomy.

Keywords: *Academic Writing, AI Assisted Instruction, AI in Education, AI, ESL, IA, Writing Skills.*

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1. Background & Introduction

The age of technology, combined with access to smartphones, the internet, and social media platforms, enables the instant spread of new advances worldwide. One such advance is the emergence of the AI timeline, which was not widely known in its infancy but has now become mainstream. It has altered almost every discipline, changing and redefining social realities for people worldwide, whether it is Smart Farming using AI for efficient solutions to meet the demands of agriculture (Akkem, Biswas, & Varanasi, 2023) or AI playing the role of lecturer in a higher education classroom (Alen, Maihanemi, & Pasvenskiene, 2025). AI appears to be transforming people's thought processes, reshaping their beliefs about science and technology.

On the one hand, AI is lauded for improving human experiences (Kasparov, 2018), while on the other, it is labeled as a demon (Musk, 2014) and could spell the end of the human race (Hawking, 2014). There is a plethora of studies in the domain of AI that appreciate its benefits and potential, while many scholars warn of its harmful, long-term, and devastating impacts. There is widespread use of AI tools, including ChatGPT, Gemini, Copy.ai, and Quillbot, among a diverse range of ESL learners, teachers, and policymakers. Huang et al. (2020) advocate leveraging AI tools to provide an adaptive learning medium that offers language learners a highly interactive, unprecedented, and immersive educational experience. AI integration in the ESL context is primarily used for grammatical correction, organizing ideas, and generating ideas (Deep et al., 2025; Tran, 2023). It has improved learners' writing proficiency, grammar, and cohesion (Song & Song, 2023; Mahapatra, 2024). Another positive impact of AI integration is increased motivation, engagement, and confidence in ESL learners (He, 2024; Fathi & Rahimi, 2024), as well as support in idea generation (Kim, Destrick, & Li, 2025). Writing skills, particularly academic writing, pose numerous challenges for learners, as they are cognitively demanding for ESL learners (Gayed, Carlon, Oriola, & Cross, 2022; Zhao & Cox, 2024).

Although AI offers numerous benefits, it is not infallible and has its limitations and inherent challenges. Learners overly rely on AI, which hinders their ability to control plagiarism and compromises originality and creativity (Dergaa, Chamari, Zmijewski & Saad, 2023; Jarrah, Wardar & Fidalgo, 2023). ESL educators also face challenges, as they cannot distinguish between AI-generated text and learners' drafts (Casal & Kessler, 2023; Bush & Hausvik, 2023). It would be unjust to disregard all the benefits of AI solely because of its potential consequences. Therefore, there is a pressing need for empirical investigation to understand the full potential of AI, as some studies (Zlfa et al., 2023; Aljuaid, 2024) suggest that striking a balance between using AI assistance and developing academic writing skills is important. AI intervention appears promising in improving the

academic writing skills of ESL learners, but no previous study has provided precise empirical data to support its applicability and pedagogical implications.

1.1. Statement of Problem

Academic writing skills are inevitably significant for learners of almost every discipline, considering that the medium of instruction and publication in academia is English. Despite the introduction of diverse teaching methods and innovative approaches, ESL learners still face challenges in developing their academic writing skills. The methods most often focus on grammar, vocabulary, and cohesion rather than on critical thinking and the development of autonomy among ESL learners, since they rely on the teacher for reassurance about their academic work. For teachers, it is quite a challenge to respond to queries, evaluate, and provide personalized feedback to each student in real-time. The teaching and learning process for academic writing, thus, becomes challenging and time-consuming for ESL learners and teachers. In this regard, AI intervention can offer benefits by providing learners with instant, personalized feedback. Empirical evidence regarding the utility of AI instructions in ESL contexts is minimal and requires investigation. In Pakistan in particular, learners often receive minimal interactive writing support, and AI integration remains largely unexplored. Thus, the study aims to investigate the integration of AI in exploring the development of Academic Writing skills in ESL learners, thereby contributing to gaining insights into the pedagogical value of AI in language education.

1.2. Research Objectives

- To explore the potential of AI integration in an ESL academic writing class
- To compare AI-integrated and traditional teaching instruction for ESL learners in an academic writing class
- To analyze ESL learners' behavior towards teacher assisted vs AI assisted feedback in academic writing classes

1.3. Research Questions

1. What are the pedagogical possibilities of AI integration for ESL learners' academic writing skills, engagement, revisions, and autonomy?
2. How well does AI-integrated instruction improve academic writing skills of ESL learners in comparison with the conventional instruction in the classroom?
3. What differences are there in terms of engagement, participation, revisions, collaboration, and autonomy among learners who attend academic writing classes integrated with AI and conventionally taught?

1.4. Significance of the Study

The current study is significant both theoretically and practically, as it provides empirical evidence for integrating AI into ESL academic writing classes. It guides ESL instructors, curriculum designers, and policymakers in recognizing AI as an essential tool and in incorporating its legitimate use into writing courses. It highlights the potential of

AI to foster learner autonomy and promote a process-based approach to writing. Furthermore, a mixed-methods study offers insights into learners' performance and attitudes towards learning with AI support, making the research pedagogically impactful.

2. Literature Review: AI Integration in the Academic Writing Classroom

This section includes relevant studies that support and strengthen the foundation of the current research, examining whether AI paves the way for its integration into academic writing in ESL contexts, or whether skepticism is warranted regarding its use for educational purposes.

Intensive scholarly attention is needed to explore and leverage the benefits of AI in academic writing for ESL learners. Gayed et al. (2022) developed a writing-based AI application, 'AI KAKU', to develop cognitive capabilities in EFL learners. Their experimental study found that the benefits of AI surpass those of traditional word processors and recommended AI as a more structured assistant for English writing conventions. Fathi and Rahimi (2024) employed the Vygotskian framework to analyze AI's impact on IELTS exam preparation and reported developmental benefits and positive attitudes of learners in the class. Mahapatra (2024) used ChatGPT as a feedback tool and found it beneficial for providing real-time, personalized responses in a dialogic format in large classrooms.

Tran (2023) investigated the perceptions of ESL teachers and students, reporting enhanced cohesion and language accuracy in discourse-level writing. Koedinger et al. (2015) outlined the improvement in language proficiency achieved through AI-powered tutoring compared to traditional teaching methods. In South Korea, learners recorded their responses indicating a preference for AI-based mobile apps for language writing practice and for technology to facilitate their learning process (Lee & Lee, 2018). Similarly, Li et al. (2021) highlighted the benefits of personalized learning opportunities in writing classes for addressing students' diverse needs.

Malik et al. (2023) from Indonesia recorded the views and opinions of 245 undergraduates on the use of AI tools while writing academic essays. The scholars found that learners appreciated grammar and spelling checks, plagiarism detection, and translation features; however, they also felt overwhelmed and stressed about issues related to academic integrity and self-efficacy. Zulfa et al. (2023) also conducted a survey to report on learners' perspectives on using approximately 15 different AI tools, finding that AI use was helpful for grammar, vocabulary, and coherent drafting. Another study (He, 2024) was conducted in China to evaluate automated evaluation systems (AWE) in ESL, reporting inspiring benefits, including improved motivation, academic buoyancy, enjoyment, development of learner autonomy, and goal-directed writing.

Despite these acknowledged benefits, there are critical concerns about the unsupervised, uncontrolled use of AI in academic writing in the ESL context. Deep,

Martirosyan, Ghosh, & Rahaman, M. S. (2025) raised critical concerns about the challenges posed by ChatGPT to plagiarism and misinformation for ESL learners. Busch and Hausvik (2023) highlight a skeptical stance towards ChatGPT, arguing that ChatGPT's answers can pass any exam like a student's, and criticize the use of AI for academic misconduct and overreliance. Similarly, Roe et al. (2023) highlighted concerns about academic integrity in ESL learners' academic writing classes, particularly regarding the use of AI tools for translation, paraphrasing, and writing assistance. Li et al. (2024) express reservations about the limited potential of AI content detectors, questioning the originality of human writing among ESL learners.

Al-Sofi's (2024) findings are ambivalent regarding the use of AI in Saudi Arabia, highlighting the EFL learners' articulated benefits of ChatGPT assistance in academic writing, as well as the challenges of plagiarism, raised content risk, factual inaccuracies, and over-reliance on AI. In China, Zhao, Hu, and Coz (2024) assessed the use of Wordtune and revealed that the ESL learners with beginner level use all AI functions indiscriminately while the advanced learners used selective features and prompts for improving the formality tone in their writings, highlighting the guided and supervised use of AI for varied differentiated skills learners to enhance their writing proficiency. Ethical concerns regarding inaccurate content and overreliance were also underscored by Guo and Zaini (2024), while acknowledging the benefits of improved grammar and learning support.

Dergaa et al. (2023) evaluated NLP tools, including ChatGPT, highlighted their benefits, but warned of potential threats to the ethical integrity of academia and the lack of creativity in AI-generated texts. Raheem, Anjum, and Ghafar (2023) reviewed AI tools, including QuillBot, Grammarly, and ChatGPT, identifying deviations from academic writing and overreliance on AI as prominent issues in the ESL context. Song and Song (2023) assessed the efficacy of ChatGPT for academic writing in Chinese learners and found increased motivation, improved grammar, and structure; however, they also highlighted contextual inaccuracies and the potential for long-term reliance on AI as serious concerns. Nurchurfiani et al. (2025) highlighted the benefits of conceptual planning and AI-assisted editing, but raised concerns about academic integrity, bias, and a lack of ethical and academic rigor. A few very realistic issues have been raised from Serbia and Bosnia (Jankovic and Kulic, 2025), beyond the appreciation of AI tools. The learners struggled to retain the original idea in the AI-generated differentiated content, and the authors contend that critical thinking and evaluation skills are essential for effective AI intervention. Similarly, Kim et al. (2025) highlighted the challenges of content relevance, students' ability to use AI, and the need for differentiated task requirements for ESL learners.

In academic writing, the roles of reviewers and editors are relevant, and their input tends to provide valuable insights into the role of AI intervention. Casal and Kessler (2023)

included reviewers and editors in their study, asking survey participants to distinguish between abstracts written by humans and those written by artificial intelligence (AI). Then, Casal and Kessler (2023) interviewed them to understand the reasons behind their decisions and whether they accept the use of AI in academic contexts. Casal and Kessler's (2023) findings revealed that reviewers were unable to distinguish between human-written and AI-generated texts, and that editors were dismissive of the use of AI in academic writing. It is entirely unjust to disregard the potential and benefits of AI in improving ESL learners' English academic writing skills solely because of its limitations. Aljuaid (2024) acknowledged the transformative role of AI in instruction but asserted that creativity and critical thinking skills are compromised when AI is overused, thereby suggesting a balanced model that integrates traditional methods with AI interventions for English as a Second Language (ESL) learners. Thus, with responsible use, adherence to ethical academic practices, and respect for ethical conventions, ChatGPT appears promising for enhancing ESL academic writing skills (Jarrah, Wardat, and Fidalgo, 2023).

3. Research Methodology

3.1. Research Design

The current study employed a mixed-methods design (Creswell, 2014) to explore the actual potential of AI in an academic writing course for ESL learners. The study used a quantitative quasi-experimental pretest/posttest design (Fraenkel et al., 2012) with two groups: an experimental group and a control group. One group received AI-integrated AI-assisted instruction (experimental group), whereas the control group was taught using traditional academic teaching methods. The design is quasi-experimental because participants were not randomly selected; instead, two existing sections of the C1-level ESL academic writing course were chosen. Section A was designated as the experimental group, and Section B was labeled the control group. Both sections followed the same course outline, learning objectives, and assessment criteria to ensure equivalency. Since random assignment of groups was infeasible due to institutional constraints, the quasi-experimental design remained the most appropriate approach for assessing the AI intervention in the context of language education. Furthermore, a qualitative observation sheet was used to gain deeper insight into learners' engagement, participation, behavior, and development of writing skills.

3.2. Data Collection

A total of 15 C1-level ESL learners were enrolled in each section, A (experimental group) and B (control group), at the National University of Modern Languages (NUML).

3.2.1. Instruments & Tools

- **Placement Test & Assessment for Learning**

Both groups took a writing test before and after the intervention, which was assessed by using standardized rubrics for task completion, grammar, content, vocabulary, and cohesion.

- **Lesson Plans**

Lesson plans were developed for the same learning objectives and content for both groups. The AI tools were incorporated in section A, while the traditional writing approach was used in section B.

- **Observation Sheet**

A semi-structured observation sheet was used to document learners' behavior towards AI tools, their collaboration, engagement, learner autonomy, and confidence.

- **Field Notes**

Reflective field notes were recorded to supplement observational data, enabling practical interpretation of classroom dynamics.

3.3. Procedure

The investigation and intervention will span over 8 weeks. In the first week, all the students took a diagnostic writing test (a pre-test), followed by 6 weeks of teaching and training. Last week, a post-test was conducted. For observation, field notes and an observation sheet were used during the practice stages of writing twice a week.

4. Method of Analysis

4.1. Quantitative Analysis

For the quantitative data on learners' pre- and post-test scores, T-tests were conducted to analyze the scores and evaluate the magnitude of mean differences.

4.2. Qualitative Analysis

Observation data were analyzed using thematic analysis and manual coding. The main categories were learners' engagement, their interaction with the technology, their written and oral responses, and their interaction with peers and the teacher.

Overall, the data from the current study provided insight into AI intervention, enhancing the validity and reliability of the findings.

5. Data Analysis & Findings

A quasi-experimental (Fraenkel et al., 2012) mixed-methods approach (Creswell, 2014) has been used to investigate the potential of AI on learners' writing performance. The quantitative data, including pre-test, post-test, and normalized gain (Hake, 1998), and qualitative data, including a classroom observation sheet, were analyzed to gain insight into the intervention's impact on the academic writing class.

5.1. Quantitative Analysis

5.1.1. Section A Pre-test Scores

A pre-test containing a summary-writing question was administered to learners in both the control and experimental groups. The test was assessed using rubrics (Appendix

A) to ensure uniformity in the evaluation of learners' performance. The results of the tests from both groups are given in the table below:

Table 1: Scores Comparing pre-test & post-test Results

S#	Pre-test Scores Experimental Group	Pre-test Scores Control Group
1	6	6
2	6	5
3	5	5
4	6	7
5	6	6
6	7	5
7	6	5
8	4	6
9	4	5
10	5	6
11	6	7
12	6	6
13	6	7
14	5	5
15	6	5
Average Mean Values	5.6	5.73

The results show similar performance among students in sections A and B on the pre-test, indicating comparable proficiency in English academic writing. The experimental group's average pre-test score was 5.60, while the control group's was slightly higher at 5.73. The standard deviations were 0.83 for the intervention group and 0.80 for the control group, indicating minimal variation and confirming that both groups were comparable and suitable for AI intervention.

After eight weeks of teaching academic writing in both sections, a post-test was conducted in both groups. The results are given in the table below:

Table 2: Comparison of Post-test Scores of Experimental and Control Groups

S#	Post-test Scores Experimental Group	Post-test Scores Control Group
1	7	7
2	7	6
3	6	6
4	7	5
5	8	6
6	8	6
7	8	6

8	6	7
9	6	6
10	7	6
11	7	7
12	6	6
13	6	6
14	6	6
15	7	5
Average Mean Values	6.8	6.06

The results show improved academic writing skills in both groups. The average mean value increased from 5.06 to 6.80 in section A; the learner's performance was noted, while the mean value of the control group increased from 5.73 to 6.02 in section B.

5.1.2. Comparing Pre-Test & Post-Test Results

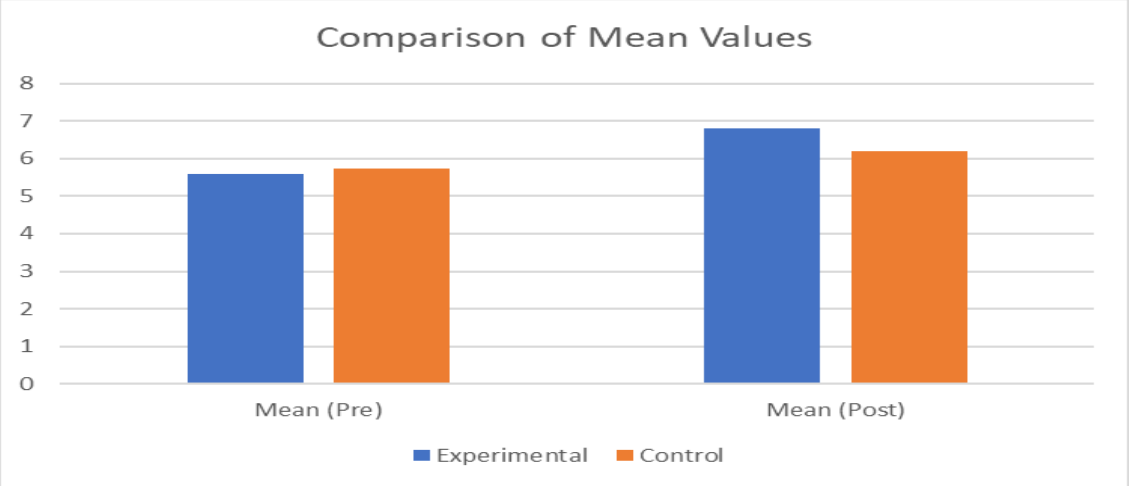
The average mean values and standard deviation values for both groups are critical in validating the findings, so for the current study, they are given in the table below:

Table 3: Mean & Standard Deviation Values' Summary

Group	Mean Values Pre-test	Mean Values Post-Test	Standard Deviation Pre-test	Standard Deviation Post-test
Experimental	5.60	6.80	0.83	0.77
Control	5.73	6.20	0.80	0.77

The graphical representation of the data is given below for clarity of view and understanding:

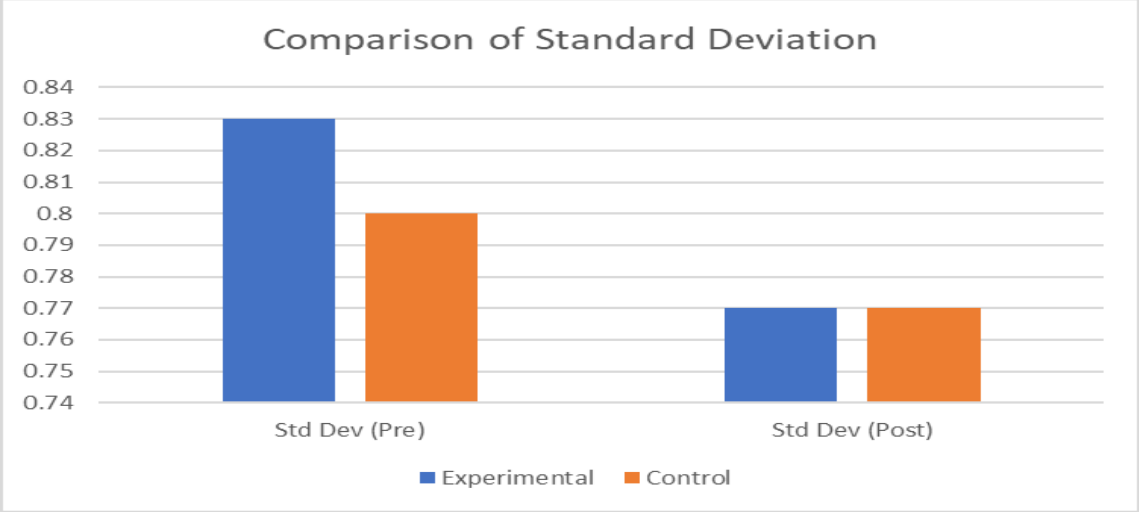
Figure 1: *Comparison of Mean Values*



The experimental group demonstrated an increase in writing performance, as evidenced by the average points, from a pre-test mean of 6.80 to a post-test mean. In

contrast, the control group increased by a smaller gain of 0.47 points, which highlights that learners receiving AI integration in their teaching and learning environment made significantly better improvements in their writing scores after the intervention of AI, compared to the control group that was taught using traditional methods.

Figure 2: *Comparison of Standard Deviation*



The standard deviations were 0.83 for section A (intervention group) and 0.80 for the control group, indicating similar variability in learners' writing performance before the intervention. The post-test standard deviations remained nearly the same in both groups (0.77), suggesting that score consistency had not changed significantly and validating the findings. The consistency of standard deviations with increasing mean scores reflects uniform improvements within the experimental group, rather than improvements limited to a few high achievers.

Overall, the experimental group with AI-integration showed a higher average gain and maintained consistent performance across the group, indicating effectiveness and equity in learning objectives. At the same time, the modest increase in the control group is attributable to regular traditional instruction.

5.2. Normalised Gain

Since this is an educational study, the Normalized Gain (Hake, 1998) metric was used to measure the effectiveness of instruction by comparing learners' pre-test and post-test scores, indicating the minimum possible fraction of improvement.

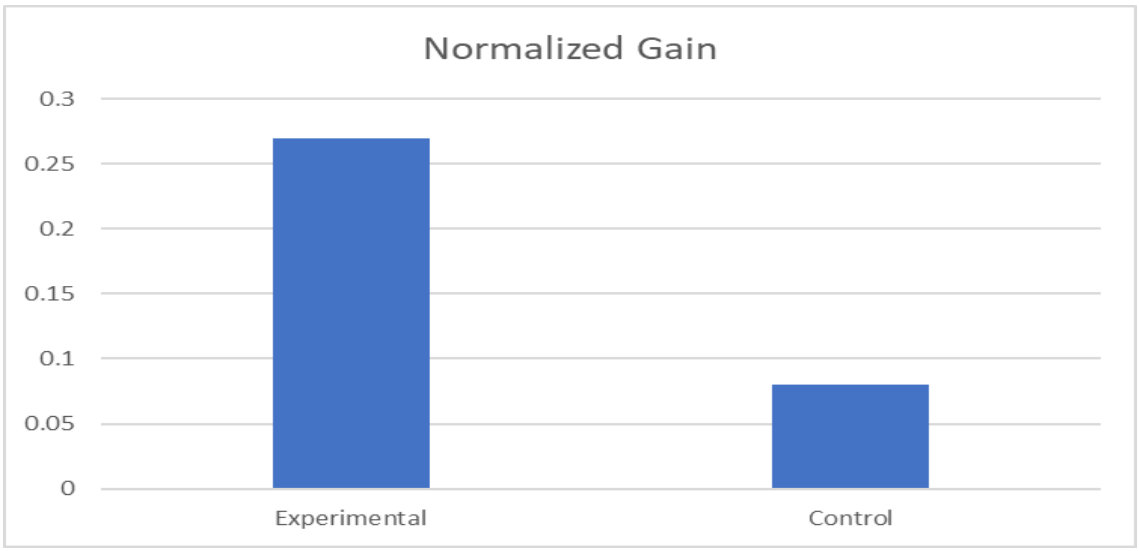
Where 'Pre' means Pre-test score, 'Post' means Post-test score, and 10 is the maximum possible score, and the summed maximum possible score is 10. The values for Normalized Gain are given in the table below:

Table 4: Normalized Gain (Hake's g)

Group	Normalized Gain
Experimental	0.27
Control	0.08

The graphics representation of the Normalized Gain

Figure 3: *Normalized Gain*



The Normalized Gain (Hake, 1998) for the experimental group was 0.27. In contrast, the control group achieved only 0.08, indicating that the experimental group met learning objectives by 27%, whereas the control group achieved only 8%. In practice, the experimental group made three times as much progress as the control group in improving academic writing skills. Generally, thresholds for interpretation for Normalized Gain are:

- **High gain**: $g \geq 0.7$
- **Medium gain**: $0.3 \leq g < 0.7$
- **Low gain**: $g < 0.3$

Considering the thresholds, the experimental group falls within the low-to-moderate gain category, which is closer to the mild range. In contrast, the control group lies in the low-gain range. Hence, the experimental group was deemed 3.5 times more effective than the control group after the intervention.

5.3. T-Test Results

To confirm the mean scores within groups, paired t-tests and independent t-tests were used to assess statistical differences between groups. The results of the t-test, p-value, and importance are given in the table below:

Table 5: T-Test Results

Test	p-value	Significance (α = 0.05)
Paired t-test (Experimental)	0.0000076	Significant
Paired t-test (Control)	0.110	Not significant
Post-test Independent t-test	0.0429	Significant

5.4. Paired T-Test

Since the learners took both tests, a paired t-test is used to assess the difference in their scores before and after the treatment to determine whether the improvement was significant. The statistical representation is given below:

Where the mean of the differences between pre-test and post-test scores s_d represents the differences in standard deviation, n is the number of ESL learners, and $\frac{s_d}{\sqrt{n}}$ is the mean difference for standard error.

The p-value is 0.0000076 in section A (experimental group), which is smaller than the significance level of α = 0.05. It indicates a difference between the average pre-test and post–test scores, suggesting that the integration of AI in the academic writing class led to greater improvement. In the control group, the p-value is 0.11, which is greater than 0.05. It indicates that no significant difference was observed between the pre-test and post-test scores for the control group in the traditional teaching and learning environment. Therefore, the improvement is not statistically reliable and may be considered a chance occurrence.

5.5. Independent T-Test

An independent t-test was used to examine whether the AI-integrated group outperformed the control group. The findings reveal that both groups were independent of each other; the test enabled a valid comparison of the post-intervention results. The statistical chart for the independent t-test is given below:

Where: $\underline{X_1}$, $\underline{X_2}$ are the mean values of the experimental and control groups, s_1^2 , s_2^2 are the variances of the experimental and control groups, and $n_1^{\square}$ $n_2^{\square}$ are the sample sizes of each group

In statistical analysis, the p-value is 0.0429, which is less than the significance level of 0.055. The p-value highlights a significant difference between the experimental and control groups. It reveals that section A with AI intervention performed better in writing performance compared to the control group, which was not given access to AI.

Overall, the t-test results support the effectiveness of AI integration in academic writing classes, as the experimental group highlights greater improvement in learners' writing skills. The control group showed minimal improvement. Therefore, the experimental group outperformed the control group in a statistically significant manner.

The findings validate the positive impact of integrating AI in writing classes to enhance learners' writing skills.

5.6. Observation Sheet

An observation sheet was used twice per week in the 8-week course. It documented student engagement, writing behaviors, collaboration, autonomous learning, and teachers' input in class. The data were coded thematically and categorized for qualitative analysis. The snapshot of the findings is given in the table below:

Table 6: Observed Classroom Behaviors

Category	Experimental Group	Control Group	Field Notes AI group	Field Notes Controlled group
Student engagement	4.5/5	3/5	More engagement and focus	Less engaged and distracted at times
Active participation	✓✓✓	✓✓	Active participation in writing tasks	Less active, only at the beginning of the class
Collaboration/ Peer Feedback	moderate	frequent	Less teacher-student or peer interaction	More interactive writing sessions
Teacher Feedback	moderate	frequent	Less reliance on the teacher for feedback	Relies on teacher feedback mostly
Tools/AI	frequent	Rarely	Using AI before (planning), during(vocabulary) and after writing (proofreading)	Occasionally used a dictionary/ thesaurus or a book
Revisions after Feedback	✓✓✓✓	✓✓	Revised efficiently	Only a few revised the drafts after feedback
Autonomy/ Independence	high	moderate	Wrote independently for even newer concepts	Less autonomous, relies on repeated instruction

6. Analysis and Interpretation of Classroom Observation Data

The thematic analysis of the observation sheet reveals notable differences in student engagement, participation, collaboration, teacher input, revisions or corrections, tool use, and learner autonomy.

6.1. Student Engagement and Participation

Higher engagement is observed in the experimental group, with a score of 4.5/5, compared to 3/5 in the control group. Field notes indicate that students showed greater focus and prolonged attention, while learners in the control groups were frequently distracted or less engaged in the writing tasks. Active participation was maintained by

learners throughout the group, unlike in the control group, where learners were often bored and were instructed to continue writing or complete their work.

6.2. Peer Collaboration and Feedback

Interestingly, more collaboration and peer discussion were observed in the control group. In contrast, learners in the experimental group exhibited moderate human interaction and more AI-personalized interactions, and engaged in individual work. Learners in the control group relied on the teacher's feedback most of the time and had to wait for their turn, which led to distraction.

6.3. Use of Tools and AI

A notable contrast in tool use is evident: learners in the experimental group frequently used AI across all stages of writing, including planning, vocabulary search, and proofreading. In the control group, learners occasionally used dictionaries, thesauruses, or books, which suggests that AI facilitates metacognitive awareness and process-oriented writing skills, allowing learners to scaffold their learning at their own pace.

6.4. Revisions after Feedback

It is quite a challenge for learners to revise their work after receiving feedback on a writing task; however, learners in the experimental group were observed to revise more frequently, both at home and in class. In contrast, learners in the control groups barely revised their work after receiving the teacher's detailed feedback in the form of notes on their drafts.

6.5. Autonomy and Independence

The most prominent observed improvement is the development of learner autonomy among learners in the experimental group. The learners not only demonstrated confidence in writing, but they also attempted new types of writing ahead of class. In contrast, learners in the control group showed minimal independence. They relied on the teacher for repeated instructions, which highlights the potential of AI tools to foster learner autonomy, enabling them to explore ideas and continue developing skills even after the course concludes.

Overall, the data from the observation sheet support the idea that AI-integrated teaching methods have a positive impact on ESL learners' class engagement, motivation to revise drafts, independence, autonomous learning, and strategic use of tools. The control group exhibited stronger teacher-learner interaction and greater dependence on the teacher. The experimental group highlights enhanced autonomy and process awareness, affirming the value of AI in developing writing skills.

7. Conclusion

The current study found that AI has the potential to improve ESL learners' academic writing skills and their attitudes toward learning in the classroom. The findings, supported by empirical evidence, suggest that integrating AI into academic writing skills

classes for ESL learners is more effective than traditional teaching methods, which leads to the idea that AI can be harnessed as an IA (Intelligent Assistant) during class activities and the learning process, enhancing ESL learners' writing performance, engagement, independence, and motivation. AI integration demonstrated a significant improvement in statistical analysis when quantitative and qualitative data from the observations sheet corroborated the results, highlighting a more positive attitude toward overall learning in academic writing skills.

8. Implications

AI has the potential to enhance ESL learners' writing skills, particularly when used as a support or aid in the classroom. The ESL learners will not only become independent but also be motivated intrinsically to take responsibility for their learning. However, it should not be used as a replacement for official writing or assessment purposes due to concerns about academic honesty and integrity.

9. Limitations and Future Research

The current study has a limited time and scope, so future research can explore the long-term effects of AI integration and examine its use across different genres or disciplines. Additionally, the potential for AI collaboration can be explored to address the lower peer interaction observed in the experimental group.

References

Akkem, Y., Biswas, S. K., & Varanasi, A. (2023). Smart farming using artificial intelligence: A review. *Engineering Applications of Artificial Intelligence*, *120*, 105899.

Alén, A., Mäihäniemi, B., & Pasvenskienė, A. (2025). AI in the Lecture Room: Analysing Two Use Cases in the Context of Higher Education. In *Emotional Data Applications and Regulation of Artificial Intelligence in Society* (pp. 183-199). Cham: Springer Nature Switzerland.

Aljuaid, H. (2024). The impact of artificial intelligence tools on academic writing instruction in higher education: A systematic review. *Arab World English Journal (AWEJ) Special Issue on ChatGPT*.

Al-Sofi, B. B. M. A. (2024). Artificial intelligence-powered tools and academic writing: to use or not to use ChatGPT. *Saudi Journal of Language Studies*, *4*(3), 145-161.

Busch, P. A., & Hausvik, G. I. (2023, August). Too Good to Be True? An Empirical Study of ChatGPT Capabilities for Academic Writing and Implications for Academic Misconduct. In *AMCIS*.

Casal, J. E., & Kessler, M. (2023). Can linguists distinguish between ChatGPT/AI and human writing?: A study of research ethics and academic publishing. *Research Methods in Applied Linguistics*, *2*(3), 100068.

Deep, P. D., Martirosyan, N., Ghosh, N., & Rahaman, M. S. (2025). Chatgpt in ESL higher education: Enhancing writing, engagement, and learning outcomes. *Information*, *16*(4), 316.

Dergaa, I., Chamari, K., Zmijewski, P., & Saad, H. B. (2023). From human writing to artificial intelligence generated text: examining the prospects and potential threats of ChatGPT in academic writing. *Biology of sport*, *40*(2), 615-622.

Fathi, J., & Rahimi, M. (2024). Utilising artificial intelligence-enhanced writing mediation to develop academic writing skills in EFL learners: a qualitative study. *Computer Assisted Language Learning*, 1-40.

Gayed, J. M., Carlon, M. K. J., Oriola, A. M., & Cross, J. S. (2022). Exploring an AI-based writing Assistant's impact on English language learners. *Computers and Education: Artificial Intelligence*, *3*, 100055.

Guo, H., & Zaini, S. H. (2024). Artificial Intelligence in Academic Writing: A Literature Review. *Asian Pendidikan*, *4*(2), 46-55.

He, Y. (2024). The metaphor of AI in writing in English: A reflection on EFL learners' motivation to write, enjoyment of writing, academic buoyancy, and academic success in writing. *International Review of Research in Open and Distributed Learning*, *25*(3), 271-286.

Janković, A., & Kulić, D. (2025). Use And Misuse of ChatGPT in Academic Writing Among the English Language Students. *Information Technologies and Learning Tools*, *105*(1), 178.

Jarrah, A. M., Wardat, Y., & Fidalgo, P. (2023). Using ChatGPT in academic writing is (not) a form of plagiarism: What does the literature say. *Online Journal of Communication and Media Technologies*, *13*(4), e202346.

Kim, J., Yu, S., Detrick, R., & Li, N. (2025). Exploring students' perspectives on generative AI-assisted academic writing. *Education and Information Technologies*, *30*(1), 1265-1300.

Li, H., Lee, S., & Botelho, A. F. (2024, July). This Paper Was Written with the Help of ChatGPT: Exploring the Consequences of AI-Driven Academic Writing on Scholarly Practices. In *Proceedings of the 17th International Conference on Educational Data Mining. International Educational Data Mining Society, Atlanta, Georgia, USA, S* (pp. 542-550).

Mahapatra, S. (2024). Impact of ChatGPT on ESL students' academic writing skills: A mixed methods intervention study. *Smart Learning Environments*, *11*(1), 9.

Malik, A. R., Pratiwi, Y., Andajani, K., Numertayasa, I. W., Suharti, S., & Darwis, A. (2023). Exploring artificial intelligence in academic essay: higher education student's perspective. *International Journal of Educational Research Open*, *5*, 100296.

Nurchurifiani, E., Maximilian, A., Ajeng, G. D., Wiratno, P., Hastomo, T., & Wicaksono, A. (2025). Leveraging AI-Powered Tools in Academic Writing and Research: Insights from English Faculty Members in Indonesia. *International Journal of Information and Education Technology*, *15*(2), 312-322.

Raheem, B. R., Anjum, F., & Ghafar, Z. N. (2023). Exploring the profound impact of artificial intelligence applications (Quillbot, Grammarly and ChatGPT) on English academic writing: A Systematic Review. *International Journal of Integrative Research (IJIR)*, *1*(10), 599-622.

Roe, J., Renandya, W. A., & Jacobs, G. M. (2023). A review of AI-powered writing tools and their implications for academic integrity in the language classroom. *Journal of English and Applied Linguistics*, *2*(1), 3.

Song, C., & Song, Y. (2023). Enhancing academic writing skills and motivation: assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. *Frontiers in Psychology*, *14*, 1260843.

Tran, T. T. H. (2023). AI tools in teaching and learning English academic writing skills. In *Proceedings of the AsiaCALL international conference* (Vol. 4, pp. 170-187).

Zhao, X., Hu, J., & Cox, A. (2024). Incorporating artificial intelligence into student academic writing in higher education: The use of Wordtune by Chinese international students.

Zulfa, S., Dewi, R. S., Hidayat, D. N., Hamid, F., & Defianty, M. (2023, August). The use of AI and technology tools in developing students' English academic writing skills. In *Proceeding International Conference on Education* (pp. 47-63).