

The Effectiveness of AI-Writing Tools (ChatGPT and Grammarly) in Enhancing Academic Writing among EFL University Students

 Anwaar Omar Alashab

Department of English, Faculty of Languages, Elmergib University, Libya

aoalashab@elmergib.edu.ly

Abstract

The recent employment of Artificial Intelligence (AI) inside English language classrooms has affected learners of English as a foreign language (EFL) in their learning. This research paper has focused on using AI-based tools to enhance academic writing for EFL students, such as Grammarly and ChatGPT. Various classroom applications and homework were conducted to evaluate students' grammatical accuracy and lexical diversity, as well as overall writing quality, after students used AI tools such as Grammarly and ChatGPT. The results indicate that Grammarly reduced students' mistakes and clarified them with explanations, while ChatGPT supports idea generation, paraphrasing, and academic style development. However, some problems may arise due to overreliance on using these tools. Moreover, these tools should be used under teacher control and as a complementary aid, not a replacement for human thinking. This study concluded that while AI tools enhance certain aspects of writing skills, teacher feedback remains essential for developing higher-order skills.

Keywords: EFL Students-ChatGPT- Grammarly AI Tools-Academic Writing

المخلص

إن توظيف الذكاء الاصطناعي داخل القاعات الدراسية لتعليم اللغة الإنجليزية كلغة أجنبية قد أثر على تعلم الطلاب بشكل واضح. وقد سلط هذا البحث الضوء على استخدام الأدوات القائمة على الذكاء الاصطناعي في تطوير الكتابة الأكاديمية لدى طلاب اللغة الإنجليزية كلغة أجنبية مثل أداتي مثل: Grammarly و ChatGPT. وقد تم تنفيذ أنشطته صافية وواجبات منزلية لتقييم دقة الطلاب النحوية وتنوعهم اللغوي ومدى تطور مهاراتهم الكتابية بعد استخدام هذه الأدوات. وقد أظهرت النتائج ان تطبيق Grammarly قد قلل من أخطاء الطلاب وقدم لهم توضيحات مفصلة لأجاباتهم بينما ساعد ChatGPT في توليد الأفكار وإعادة صياغة الكلمات وتطوير الأسلوب الأكاديمي. وقد استخدم الاستبيان للنظر في رأي الطلبة بعد استخدام هذه الأدوات في القاعات الدراسية. ومع ذلك، ظهرت بعض المشاكل من وجهة نظر الطلبة

بسبب الإفراط في الاعتماد على هذه الأدوات. وعلى ذلك يجب ان تستخدم هذه الأدوات تحت اشراف وتوجيه المعلم، وتستخدم كأدوات مساعدة تكمل التعليم البشري ولا تعد بديلا عنه.

كلمات مفتاحيه: طلاب اللغة الإنجليزية كلغة اجنبية، نظام المحادثة باستخدام الذكاء الاصطناعي، نظام التصحيح النحوي باستخدام أدوات الذكاء الاصطناعي، أدوات الذكاء الاصطناعي، الكتابة الأكاديمية

Introduction

Academic writing is one of the most important skills that need to be learned, and students of English as a foreign language (EFL) face many difficulties while learning this skill. Academic writing is considered difficult since it includes various parts to be studied, such as grammatical accuracy, logical organization, coherence, and unity in writing. Traditional feedback for students' writing from the teacher can be inconsistent and limited due to heavy workloads, the short time of the lecture, and the large number of students inside the classroom. Moreover, peer feedback also may suffer from reliability and lack of confidence among learners. As a result, artificial intelligence (AI)-based writing tools have emerged as a powerful resource that provides instant feedback as well as an automated writing evaluation system that focuses on grammar, spelling, and style; suggestions for unity and coherence; and support in idea development. However, their effectiveness in educational contexts is still under-researched.

Statement of the Problem

Although AI writing tools are very common among university students, their academic integrity remains a subject of debate. Previous studies have shown the role of the Grammarly app in improving students' spelling, grammar, and punctuation and the ChatGPT app in brainstorming ideas and organizing essays, but concerns remain regarding students' potential overreliance on these tools. Moreover, the growing use of AI tools among university students is important to be examined to analyze the actual effectiveness of these tools in enhancing academic writing among EFL learners. However, despite the global focus on AI-supported writing tools, there is still a significant gap in empirical research exploring its effectiveness in the Libyan EFL context.

Most previous studies have been conducted in non-Arab educational contexts, which differ considerably from Libyan universities in terms of teaching practices, availability of digital resources, and students' language proficiency levels. This gap emphasizes the importance of conducting context-specific research to better understand the role of AI writing tools in Libyan classrooms.

This study aims to investigate the impact of Grammarly and ChatGPT on students' writing performance as well as their perceptions of these tools.

Objectives of the Study

The objectives of this study are to examine the effect of AI tools like Grammarly and ChatGPT on the grammatical accuracy and idea development of EFL students' academic writing. Moreover, to compare AI writing tools' feedback with traditional teacher feedback in writing instruction. In addition, explore students' attitudes and perceptions toward the use of AI tools in their writing process.

Research Questions: 1. How does Grammarly improve the grammatical accuracy of EFL students' academic writing? 2. How effective is ChatGPT in supporting organization, coherence, and content development in writing? 3-What is more effective: teacher feedback or Grammarly and ChatGPT feedback? 4. What are students' attitudes and perceptions toward using AI tools in academic writing?

Hypothesis of the Study: Hypothesis 1: There is a significant difference in students' grammatical accuracy, coherence, and organization among those who use Grammarly, ChatGPT, and those who receive no AI support. Hypothesis 2: Students' writing performance differs significantly depending on whether they receive AI-generated feedback or teacher feedback.

Significance of the Study: This study is important since it shows us empirical evidence on the strengths and weaknesses of Grammarly and ChatGPT, which can inform teachers of some important points to pay attention to. Also, it highlights student attitude toward AI tools, which may or may not help to integrate technology into writing instructions. Finally, the study contributes to applied linguistics by examining the correlation between technology, pedagogy, and language learning.

Scope and Limitations:

The study will focus on EFL university students at the Faculty of Languages of Elmergib University. 60 males and females will participate, aged from 18 to 22. Only academic writing tasks will be considered for six weeks.

Literature Review

This section presents the main body of the study, which reviews key issues related to academic writing in EFL contexts. It focuses on aspects such as feedback in writing instruction and the role of artificial intelligence (AI) tools, including Grammarly and ChatGPT, in enhancing writing skills. The section is organized into six parts: (1) academic writing challenges in EFL contexts, (2) teacher feedback in writing instruction, (3) automated writing evaluation (AWE) systems and Grammarly, (4) AI-powered generative

tools such as ChatGPT, (5) students' perceptions of AI-based tools, and (6) an overview of the research gap and the theoretical framework guiding this study.

Academic Writing Challenges in EFL Contexts

Hyland states that academic writing is the most demanding of the four language skills, as it requires learners to master grammar, vocabulary, coherence, and critical thinking, unlike speaking or listening. In EFL contexts, learners face particular difficulties, especially in terms of accuracy, which involves grammatical and spelling errors.

In addition, learners often struggle with organization, as they demonstrate weaknesses in paragraph structure and logical progression of ideas. Coherence and cohesion also present challenges, particularly in the inappropriate use of linking devices, which results in a lack of textual unity. Furthermore, argumentation is a major difficulty, as learners often find it hard to construct clear claims and support them with relevant evidence.

Feedback Writing Instruction

Teacher feedback: Teacher's feedback is the most traditional source for students' writing corrections, and it helps students to improve their writing gradually. However, it has limitations such as workload and time constraints that prevent teachers from giving detailed feedback to large groups. Inconsistency, which refers to varying in feedback style across instructors. Focus imbalance: Some teachers focus on grammar, and others focus on the ideas.

Peer feedback: According to Liu & Hansen (2005), peer feedback can be encouraged since it stimulates group work and collaboration inside the classroom. However, some students feel unconfident about their corrections to their colleagues, and others may give inaccurate, overly critical comments.

Automated feedback: According to Chen & Cheng (2008), automated feedback may help teachers and reduce their overwork. Automated feedback is helpful in giving constant correction and improving students'

accuracy and organization, but it falls short in supporting higher-order skills.

Grammarly and Automated Writing Evaluation (AWE): Grammarly is considered one of the most widely used AWE tools. It gives immediate feedback and comments on grammar, spelling, vocabulary, style, and conciseness. Several studies have examined its educational value.

- **Li (2021):** Found that Grammarly significantly improved grammar and punctuation among EFL learners but had limited impact on content and coherence.
- **O'Neill & Russell (2019):** Reported that students appreciated Grammarly's accessibility but warned against over-reliance, as it could not replace teacher feedback.
- **Dempsey (2017):** Noted that Grammarly was effective for lower-level learners but less useful for advanced academic writing.

ChatGPT and AI-Powered Generative Tools: ChatGPT differs from traditional AWE tools in that it can generate content, suggest revisions, and provide explanations. Unlike Grammarly, which focuses on correction, ChatGPT supports idea generation, organization, and style. Emerging research highlights both benefits and challenges:

- **Lee (2023):** Found that ChatGPT helped postgraduate students brainstorm and structure essays but sometimes produced inaccurate or fabricated information.
- **Zou et al. (2023):** Reported that ChatGPT supported creativity and coherence but raised concerns about plagiarism and ethical use.
- **Kasneji et al. (2023):** Argued that ChatGPT could act as a writing assistant but stressed the need for human oversight.

Student Perceptions of AI Writing Tools: According to Bai & Hu (2022), students generally hold positive attitudes towards AI tools, appreciating their speed, availability, and detailed feedback. However, they also express concerns about the following:

- Over-dependence on AI, leading to reduced critical thinking.
- Accuracy and trustworthiness of AI-generated text.
- Academic integrity and plagiarism risks.

Difference between AWE and Generative AI tools:

Automated Writing Evaluation (AWE) systems, such as Grammarly, are designed primarily to provide corrective feedback on grammar, punctuation, and word choice and to detect linguistic errors. These systems depend on linguistic databases and programmed algorithms to help students improve the surface-level accuracy of their writing. In contrast, generative AI provides higher-level feedback, assisting learners with idea development, organization, and coherence. Generative artificial intelligence (Generative AI) tools, such as ChatGPT, operate through large language systems that can generate, rephrase, and expand entire texts based on user prompts. Therefore, while AWE tools

mainly enhance form and correctness, Generative AI supports both content generation and deeper cognitive engagement in the writing process.

Regional and Arabic Studies on AI-assisted Writing

Most research on artificial intelligence in language learning has been conducted in Western contexts; however, a growing number of studies in Arab countries have begun to explore (AI) use in EFL classrooms. For instance, Alhabib and Alghammas (2023) explored students' perspectives toward using Grammarly for giving them feedback on their writings, and they found that it enhanced students' self-editing and reduced dependency on teachers' instructions. In Jordan, Gasaymeh, Beirat, and Abu Qbeita (2024) investigated students' attitudes toward generative AI tools and found that ChatGPT and similar systems improved students' motivation and perceived writing quality. However, these positive indications about using generative AI tools such as ChatGPT in EFL contexts across the Arab region remain limited, particularly in Libya. Therefore, the present study aims to fill the gap by examining how both Grammarly (as an AWE system) and ChatGPT (as a generative AI tool) can influence Libyan EFL university students' academic writing performance.

Research gap

Although there is a growing literature on Grammarly and ChatGPT, there are still few empirical studies comparing those automated evaluation tools and teacher feedback. Limited research has been conducted on Arabic-speaking students in EFL contexts despite the rapid adoption of AI tools by those students as well. However, this study aims to fill the gap of comparing AI-generated tools' feedback and teacher feedback among EFL learners in Libyan contexts.

Theoretical Framework: This study is informed by two main frameworks. **Process Writing Theory (Flower & Hayes, 1981):** Writing skill is a continued process that involves planning, drafting, revising, and editing. AI tools can be used as assistant resources that support revision and feedback. **Sociocultural Theory (Vygotsky, 1978):** Learning occurs through interaction and mediation. AI tools serve as mediators that provide scaffolding for learners within their zone of proximal development (ZPD). Process writing theory's emphasis on feedback and revision and the use of ChatGPT and Grammarly provide new forms of feedback aligned with this process-oriented approach.

Methodology

Introduction:

This chapter highlights the methodology used to evaluate the effectiveness of using AI writing tools such as Grammarly and ChatGPT in improving students' academic writing skills. It shows the research design, sample of the study, instruments of the study, data collection, and data analysis procedures.

Research Design:

This study used a quasi-experimental method, a pre-test and post-test, to evaluate students' writing outcomes by dividing them into three groups. The first group used

Alashab, The Effectiveness of AI-Writing Tools (ChatGPT and Grammarly)

Grammarly as an automated evaluation system, the second group used ChatGPT, and the third group used teacher feedback. Quantitative and qualitative data were collected through students' writing scores and students' feedback in the questionnaire and interviews.

Participants.

The participants will be about 60 undergraduate EFL students enrolled in different years in the faculty of languages. The participants will be selected from classes that focus on academic writing.

Age range: 18–22 years

Proficiency level: Pre-intermediate to Intermediate (A2-B1)

Groups: Group A: 20 students using Grammarly

Group B: 20 students using ChatGPT

Group C: 20 students receiving only teacher feedback

Duration: 6 weeks

All participants will have studied English for at least six years. Informed consent will be obtained, and participation will be voluntary.

Sample of the study

The participants of this study consisted of 60 EFL university students enrolled at the Faculty of Languages in Alkhoms, Libya. They were selected using a random sampling technique. The participants were then divided into three groups: a Grammarly group, a ChatGPT group, and a control group receiving traditional teacher feedback. Group assignments were carried out based on the existing classes to ensure comparability among groups.

Procedure for using ChatGPT

Students in the ChatGPT group were trained on how to use this tool for academic writing purposes. They were provided with specific guidelines and sample prompts (e.g., "Provide feedback on the coherence and organization of this paragraph" or "Suggest improvement for grammatical accuracy"). Students were instructed to use ChatGPT only for revision and feedback purposes, rather than generating full essays, to maintain academic integrity. All students followed the same set of instructions to ensure a controlled use of the tool throughout the study.

Procedures for Using Grammarly

Students in the Grammarly group were guided to use the Grammarly application as a tool for revising their written work. Before the experiment, students received a brief orientation on how to use the tool effectively for identifying and correcting grammatical errors, punctuation issues, and stylistic problems. Students were asked to submit their drafts to Grammarly and review the automated feedback provided. They were then required to revise their texts based on the suggestions while maintaining their original ideas. To ensure consistency, all participants used the same version of the application and followed identical guidelines during the revision process.

Procedures for Teacher Feedback

Students in the teacher feedback group received traditional feedback from the course instructor. After completing each writing task, students submitted their drafts, which were then reviewed by the teacher. Feedback focused on the key aspects of writing, including grammatical accuracy, coherence, organization, and content development. The instructor provided written comments and corrections, highlighting errors and offering suggestions for improvement. Students were asked to revise their work based on the teacher's feedback. To ensure fairness, the same teacher evaluated all students using consistent criteria throughout the study.

Control of Variables and Experimental Conditions

To ensure the validity of the experiment, several variables were controlled. All groups were taught by the same instructor, followed the same syllabus, and completed identical writing tasks within the same time frame. In addition, all participants were given equal practice time and similar learning conditions. The only variable that differed among the groups was the type of feedback provided (ChatGPT, Grammarly, or teacher feedback).

Instruments:

Writing Tasks: Participants were asked to write an argumentative essay of 150-200 words on a general academic topic.

Writing Rubric: An analytic writing rubric will be used to evaluate students' essays.

The rubric will cover five criteria:

1. Grammar and accuracy
2. Vocabulary and style
3. Organization (paragraph structure, transitions)
4. Coherence and cohesion
5. Content and argumentation

Each category will be scored on a 1–5 scale, with a total maximum of 25 points. The rubric will be adapted from established academic writing frameworks (e.g., IELTS Writing Band Descriptors). Inter-rater reliability will be established by having two independent raters score a sample of essays.

Pre- and Posttests: Participants were divided into three groups, and they were asked to write an argumentative essay without assistance from a teacher or AI tools, and they were evaluated. After that, they asked the first group to use Grammarly, the second group to use ChatGPT, and the third group to use teachers' feedback, and they were asked to rewrite again, and they were evaluated again using a post-test to see their improvement in writing after getting the comments from the AI or from the teacher.

Questionnaire: A student perception questionnaire includes Likert-scale items and open-ended questions exploring students' attitudes toward AI tools and perceived benefits and limitations. It was administered at the end of the study.

Interviews: Semi-structured interviews will be conducted with a smaller sample of 10–12 students from each group. Interview questions will focus on students' experiences with feedback, perceived usefulness of AI tools, and challenges faced.

Procedure

Pre-test:

All participants complete an argumentative essay without any external assistance. This essay serves as the baseline measure of writing ability.

Intervention Phase (6 weeks): Group A (Grammarly): Students draft essays and revise them using Grammarly feedback. **Group B (ChatGPT):** Students draft essays, then consult ChatGPT for revision suggestions related to organization, coherence, and ideas. **Group C (Teacher Feedback):** Students receive traditional written feedback from the instructor.

Post-test:

At the end of the intervention, all students complete a second argumentative essay under similar conditions.

Questionnaire and Interview: After the post-test, students complete a questionnaire. A subset of students will also participate in interviews

Data Collection and Analysis: Quantitative Analysis

- Scores from pre- and post-test essays will be analyzed using **SPSS**.
- **Paired-sample t-tests** will measure improvement within each group.
- **ANOVA** will be used to compare differences among the three groups.
- Effect sizes will be calculated to determine the strength of improvements.

Qualitative Analysis

- Questionnaire responses will be summarized and analyzed descriptively.
- Interview data will be transcribed and analyzed thematically, identifying patterns related to students' perceptions of AI tools versus teacher feedback.

Reliability and Validity

- **Content validity:** Ensured by adapting a widely recognized rubric and piloting the questionnaire.
- **Inter-rater reliability:** Two raters will evaluate a subset of essays independently; reliability will be calculated using Cohen's kappa.
- **Triangulation:** quantitative and qualitative methods increases the credibility of findings.

Esthetical Considerations: There will be informed consent from all the participants in this study, and the participation will be voluntary with the option of withdrawal at any time.

All the data will be protected and completely preserved in handling and reporting.

Using AI inside the classroom will be instructed, and all the participants will get a clear idea about the better usage of these tools to avoid misuse of AI by the participants.

Summary

This part of the study shows the methodology of the study, including the quasi-experimental design, the participants, the instruments, the procedure, and data analysis methods. By comparing ChatGPT, Grammarly, and teachers' feedback, this study shows a comprehensive understanding of how AI tools influence academic writing among EFL students.

Data Collection and Analysis

Quantitative Analysis

- Pre- and post-test essay scores will be analyzed using SPSS.
- Paired-samples t-tests will be used to measure improvement within each group.
- Analysis of Variance (ANOVA) will be used to compare differences between the three groups.

Qualitative Analysis.

- Survey responses will be summarized and analyzed descriptively.
- Interview data will be transcribed and analyzed thematically, identifying patterns related to students' views of AI tools compared to teachers' views.

Results

Introduction

This chapter presents the results of the study on the effectiveness of Grammarly and ChatGPT in improving academic writing among EFL university students. The findings are organized into two sections: (1) quantitative results from pre- and post-test writing scores and (2) qualitative results from questionnaires and interviews.

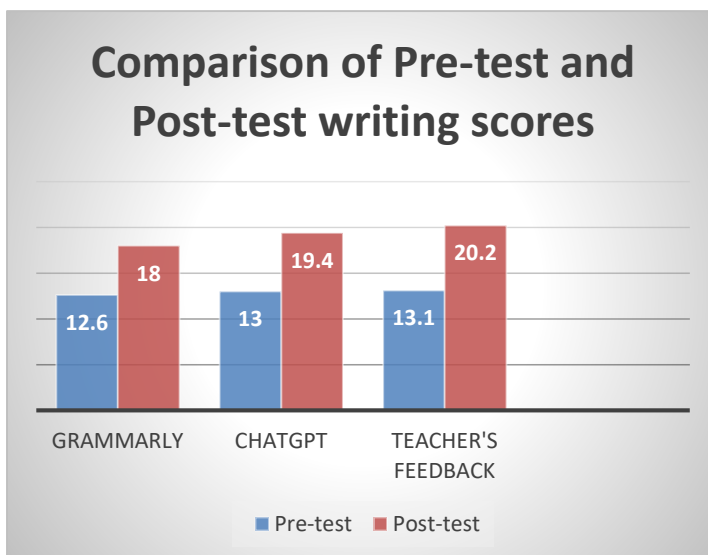
Quantitative Results: Descriptive Statistics

Table 1 summarizes the mean scores and standard deviations for the three groups (Grammarly, ChatGPT, and Teacher Feedback) in the pre-test and post-test.

Table 1: Mean Pre-test and Post-test Scores (out of 25)

Group	N	Pre-test Mean (SD)	Post-test Mean (SD)	Mean Gain
Grammarly	20	12.6 (2.4)	18.0 (2.5)	+5.4
ChatGPT	20	13.0 (2.6)	19.4 (2.8)	+6.4
Teacher Feedback	20	13.1 (2.4)	20.2 (2.3)	+7.1

Figure 1: Show the mean improvements among the groups



Paired Sample t-Tests

Within-group comparisons showed significant improvement in writing scores for all groups:

- Grammarly **Group** ($n = 20$):

$t(19) = 10.42, p < 0.001$

- ChatGPT **Group** ($n = 20$):

$t(19) = 12.35, p < 0.001$

- Teacher **Feedback Group** ($n = 20$):

$t(19) = 13.80, p < 0.001$

This indicates that all feedback methods (AI tools and teachers) were effective in improving students' academic writing.

ANOVA Results: A one-way ANOVA was conducted to compare post-test scores among the three groups. Results revealed a statistically significant difference:

A one-way ANOVA compared the post-test scores among the three groups ($n = 20$ each):

- $F(2, 57) = 5.42, p = 0.007$

Post hoc (Tukey HSD):

- Teacher Feedback > Grammarly ($p = 0.004$)
- Teacher Feedback \approx ChatGPT ($p = 0.08$)
- ChatGPT > Grammarly ($p = 0.03$)

Post-test Scores by Writing Dimension

Writing Dimension	Grammarly (Mean)	ChatGPT (Mean)	Teacher Feedback (Mean)
Grammar & Accuracy	4.2	3.8	4.3
Vocabulary & Style	3.6	3.9	4.4
Organization	3.5	4.1	4.3
Coherence & Cohesion	3.7	4.2	4.4
Content & Argument	3.3	3.8	4.5

- Grammarly group showed the strongest improvement in **grammar and accuracy**.
- ChatGPT group improved more in **organization and coherence**.
- Teacher feedback group outperformed both AI groups in **content and argumentation**.

Figure 2: Mean Writing Scores Across Feedback Types

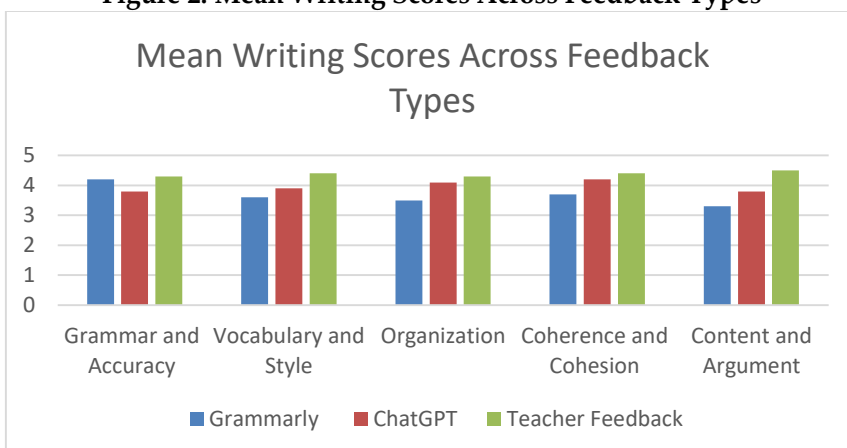


Figure 2 illustrates the mean scores of students' writing performance across five dimensions: grammar and accuracy, vocabulary and style, organization, coherence and cohesion, and content and argument. Teacher feedback consistently got the highest mean scores across all dimensions, particularly in content and argument (M = 4.5) and vocabulary and style (M = 4.4). ChatGPT performed relatively well in organization (M = 4.1) and coherence and cohesion (M = 4.2), while Grammarly showed strength in grammar and accuracy (M = 4.2). The graph clearly demonstrates the variations in

Alashab, The Effectiveness of AI-Writing Tools (ChatGPT and Grammarly)

effectiveness among the three feedback types, highlighting the particular strengths of each tool in supporting EFL students' academic writing.

Qualitative Results

Table 2: Questionnaire Findings : The questionnaire revealed the following trends:

Survey Item	Percentage
Grammarly helps me identify grammatical mistakes	91.7%
Grammarly improves my understanding of English Grammar	85.0%
Chat GPT helps me generate ideas before writing	78.3%
Chat GPT enhances my vocabulary use in writing	81.7%
Grammarly feedback is easy to understand and apply	83.3%
Chat GPT provides useful suggestions for improving my writing	85.0%
Using AI tools increases my motivation to write	78.3%
AI feedback helps me become more independent in revising my work	88.3%
AI tools save time when editing academic papers	95.0%
Overall, I am satisfied with using AI tools in academic writing	91.7%

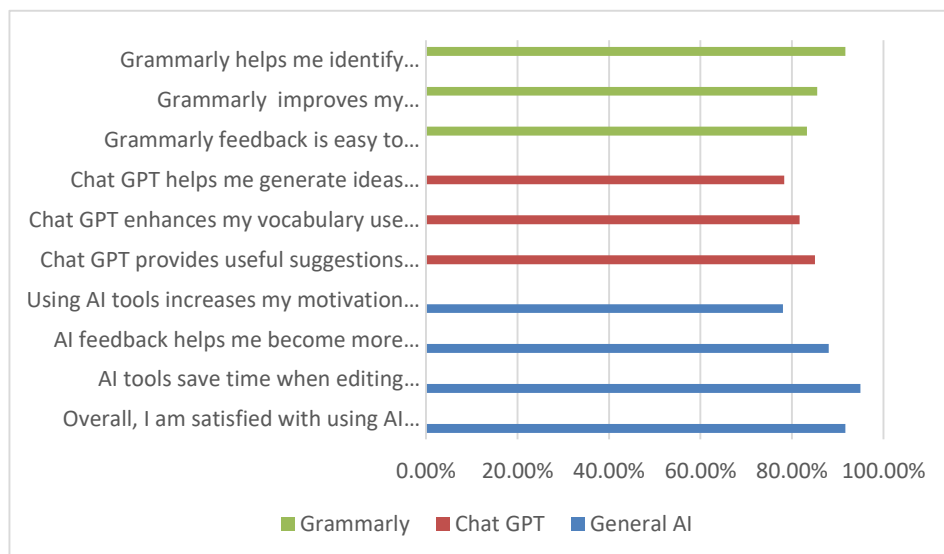
Figure3 Survey Results on AI Tools in Academic Writing

Figure 3 shows that students have a highly positive perception of AI tools in academic writing. The highest percentage (95.0%) indicates that AI tools save time during editing, while overall satisfaction is also high (91.7%). Grammarly is particularly valued for identifying grammatical mistakes (91.7%) and improving grammar understanding (85.0%). ChatGPT is seen as useful for generating ideas (78.3%) and enhancing vocabulary (81.7%).

Additionally, most students agree that AI feedback supports independent revision (88.3%) and provides useful writing suggestions (85.0%). However, its impact on motivation is relatively lower (78.3%). Overall, the findings suggest that AI tools effectively support writing quality, efficiency, and learner autonomy.

Summary of questionnaire analysis.

The Statistical Package for the Social Sciences (SPSS), version 26, was used to perform a quantitative analysis of the survey data. A five-point Likert scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree," was used to rate each item. The percentage of students who expressed positive attitudes (Agree and Strongly Agree) toward each statement was calculated using descriptive statistics, specifically frequencies and percentages. To make cross-item comparisons easier, the results were then displayed as a percentage. The majority of students believed AI-based tools like Grammarly and ChatGPT were very effective at supporting different aspects of academic writing, such as grammar

correction, organization, and time efficiency, according to the overall analysis, which showed consistently high positive response rates.

Interview Themes:

Table 3: Analysis of students' interviews generated the major themes:

Theme	Sample of questions	Summary of students' responses
Improved grammatical accuracy	How did Grammarly help you identify and correct grammatical mistakes?	"Grammarly helps me correct my grammatical mistakes easily. "
Better writing organization with ChatGPT	How did ChatGPT assist you in organizing your essay?	"Chat GPT gives me ideas on how to structure my essay. "
Increased confidence and motivation	Did using AI tools make you feel more confident about your writing?	"I feel more confident to write because I use AI tools to check my work."
Enhanced vocabulary and expressions	Did Chat GPT help you use better vocabulary or expressions?	"AI tools suggest better words for my writing. "
Time-saving and convenience	Do you think AI tools save time compared to teachers' feedback?	"It's faster to revise my work with AI than waiting for teacher feedback."
Awareness of language mistakes	How did AI tools help you notice and learn from your mistakes?	""I learn from noticing my repeated errors."
Comparison between AI feedback and Teacher feedback	How would you compare the feedback you get from AI tools with the feedback you get from the teacher?	"AI gives quick corrections, but teachers explain the reasons and guide me better. "
Concerns about over-reliance on AI	Do you feel sometimes you rely too much on AI tools?	""Sometimes I depend too much on AI tools instead of thinking for myself."

Summary of Interview Analysis

Students' opinions and experiences with AI-based writing tools were determined by conducting a thematic analysis of the qualitative data gathered from the interviews. The majority of participants stated that using Grammarly and ChatGPT improved their writing organization and coherence as well as their awareness of grammatical errors. A number of students reported that AI feedback was helpful for self-correction and

instantaneous, enabling them to learn from their errors. Teachers' feedback was received more positively than AI tools' feedback. Some participants, however, voiced concerns about relying too heavily on AI support, highlighting the necessity of striking a balance between its use and their own language practice. Overall, the analysis demonstrated that students acknowledged the value of independent learning while viewing AI tools as helpful tools that increased their writing accuracy and confidence.

Summary of Results

- Quantitative findings showed that all groups improved, with teacher feedback leading to the greatest overall gains.
- Grammarly was most effective for accuracy, while ChatGPT was more effective for organization and coherence.
- Teacher feedback outperformed AI tools in content development and argumentation.
- Qualitative findings revealed positive student attitudes toward AI tools, alongside concerns about over-reliance and ethical issues.

Discussion

This chapter interprets the findings presented in Chapter Four in relation to the research questions, objectives, and existing literature. The discussion focuses on the effectiveness of Grammarly and ChatGPT in enhancing EFL students' academic writing, compares AI-based feedback with teacher feedback, and examines students' perceptions of AI tools.

Effectiveness of Grammarly in Improving Academic Writing:

Consistent with other research, the findings show that Grammarly considerably enhanced students' correctness and grammar (Li, 2021; O'Neill & Russell, 2019). Pupils in the Grammarly group said they felt more comfortable using proper punctuation and language. Higher-order writing abilities like reasoning and content generation, however, were not significantly impacted by the technology.

Interpretation: Grammarly's automated error correction and real-time feedback on cursory writing are its strongest points. This is consistent with research on Automated Writing Evaluation (AWE) tools, which prioritize mechanical accuracy above conceptual or cognitive components of writing (Chen & Cheng, 2008).

Effectiveness of ChatGPT in Improving Academic Writing: The ChatGPT group demonstrated a notable increase in coherence and structure, demonstrating the tool's potential to support higher-order writing processes. Students reported that ChatGPT facilitated their idea generation and improved the logical organization of their essays.

- **Comparison with Grammarly:** Based on research by Lee (2023) and Zou et al. (2023), ChatGPT can offer recommendations pertaining to concept development, paragraph flow, and cohesiveness, in contrast to Grammarly, which concentrates on grammar.

- **Limitations:** In line with earlier research, students voiced worries over factual accuracy and ethical use notwithstanding these advantages (Kasneci et al., 2023).

Comparison of AI Feedback and Teacher Feedback: In both material and argumentation, the teacher-feedback group did better than both AI groups, bolstering the notion that higher-order skills are better assessed by human teachers. This result is consistent with that of Bai & Hu (2022), who found that while AI feedback enhances surface-level qualities, it is insufficient for idea creation and critical thinking.

- **Implications:** For thorough writing development, teacher supervision is still essential, even when AI tools are useful additions.

Interpretations and discussion of group differences: The results revealed that teacher-led groups outperformed both AI-assisted groups, which can be explained by several pedagogical and psychological factors. According to sociocultural theory, learners need social interaction and mediated feedback, which can be provided by the teacher more effectively than an automated system. The personal guidance and emotional support offered by the teacher enhance students' motivation and reduce anxiety, leading to better performance. In contrast, ChatGPT and Grammarly provide valuable feedback but are impersonal and lack contextual understanding, which limits students' engagement in the revision process. Moreover, students in AI groups need a higher level of learner autonomy to interrupt AI feedback independently, which might have been challenging for some learners. These findings suggest that although AI tools can enhance specific aspects of writing such as accuracy and

organization, teacher feedback remains essential for deeper learning, critical thinking, and sustained motivation.

Students' Perceptions of AI Tools: According to a qualitative investigation, students like AI tools because they provide them with immediate feedback, allow them to revise independently, and help them organize their thoughts and create content. They did, however, express worries about the following: • Over-reliance that results in less independent learning. The precision of recommendations produced by AI.

Ethical concerns and plagiarism: The literature that emphasizes that AI should supplement teacher input rather than replace it is in line with these findings (Bai & Hu, 2022; Lee, 2023).

Summary of Discussion: While grammar effectively increases accuracy, it has limitations when it comes to higher-order writing skills. ChatGPT helps students plan and structure essays by improving coherence and organization. • When it comes to argumentation and content development, teacher feedback is still superior. • Although they are aware of the limitations and ethical issues, students appreciate AI tools for their convenience and support. For the best EFL writing instruction, it is advised to combine AI tools with teacher feedback. Although AI tools provide instant feedback, they may encourage surface-level correction habits rather than deeper critical thinking.

Conclusion

This study shows that AI tools like Grammarly and ChatGPT can help EFL students improve certain parts of their academic writing. Grammarly helps with spelling and grammar, ChatGPT helps with organization and coherence, and teacher feedback is still very important for content and critical thinking. Students like AI tools, but they know they aren't perfect. This shows that writing instructions should integrate various approaches. By carefully incorporating AI tools, teachers can improve students' writing, encourage independence, and give timely feedback while upholding academic integrity. Integrating AI tools responsibly under teacher supervision can create a balanced, technology-enhanced writing pedagogy for EFL classrooms.

Summary of the Study

- 1- Examine how Grammarly affects grammatical accuracy as one of the study's objectives.
2. Assess how well ChatGPT enhances coherence, organization, and idea generation.
3. Examine the differences between teacher- and AI-based feedback.
4. Examine how students view AI tools for academic writing. Three groups—Grammarly, ChatGPT, and Teacher Feedback—were used in a quasi-experimental design. Students were given writing assignments both before and after the test, and their essays were graded using an analytical rubric. Additionally, surveys and interviews were done to find out what the students thought.

Major Findings: 1. Grammatical Accuracy: Grammarly greatly enhanced mechanics and grammar. It primarily improved surface-level writing features, in line with earlier research (Li, 2021).

2. Coherence and Organization: ChatGPT greatly enhanced the essay's logical flow, paragraphing, and structure. Higher-order abilities like cohesiveness and organization were made easier by its generative feedback.

3. Content and Argumentation: in terms of argumentation, critical thinking, and content creation, teacher feedback performed better than both AI too.

4. Perceptions of Students: o Students valued AI tools for writing assistance and instant feedback.

5. They voiced worries about accuracy, over-reliance, and moral application.

The majority of students favored a hybrid strategy that combined teacher feedback with AI tools.

Limitations of the Study: 1. The research was executed at a singular university, constraining its generalizability.

2. We only looked at two AI tools: Grammarly and ChatGPT.

3. The number of students in the sample was not very large (60–90).
4. Writing tasks were only argumentative essays; other types of writing were not allowed.
5. The study shows what AI tools could do at a certain time; the results may change with future updates.

Implications for EFL Writing Instructions.

1. AI tools should be integrated alongside the teachers' traditional instructions. For example, Grammarly can assist students with grammatical issues, while ChatGPT can assist with essay organization, with teacher feedback focusing on critical thinking and argumentation.
- 2-Students need guidance and training for doing ethical and effective AI use to avoid plagiarism and overreliance.
- 3-EFL writing programs should include AI-based assignments in their curriculum design guided by rubrics and teacher monitoring.

Relation to Theoretical Framework

According to process writing theory (Flower & Hayes, 1981), AI tools enhanced the revision stage by providing feedback on grammar and structure through using the Grammarly app and supporting the recursive nature of writing by using ChatGPT. According to sociocultural theory (Vygotsky, 1978), AI tools acted as mediators within learners' zone of proximal development (ZPD), providing stages that enable students to produce more coherent and organized writing that they could do independently.

Recommendations for Future Research.

- 1- Conduct longitudinal studies to examine long-term effects of AI tools on writing development.
- 2-Explore other AI tools and platforms to broaden understanding of pedagogical influence.
- 3-Research ethical guidelines for AI use in academic writing to prevent plagiarism and misuse.

References

- Abdulrahman, M.** (2024). ChatGPT in academic contexts: A blessing or a curse for student writing? *Journal of Academic Ethics*, 22(2), 145–163. <https://doi.org/10.1007/s10805-023-09456-0>
- Al Fadda, H.** (2024). AI writing tools in higher education: Student perceptions of ChatGPT and Grammarly. *Education and Information Technologies*, 29(1), 77–95. <https://doi.org/10.1007/s10639-023-11882-1>
- Alghamdi, A. M., & AbuSa’aleek, A. O.** (2025). Exploring postgraduates’ attitudes towards Grammarly as an automated writing evaluation tool in academic writing. *Studies in English Language and Education*, 12(2), 878–895. <https://doi.org/10.24815/siele.v12i2.39995>
- Alhabib, A., & Alghammas, A.** (2023). Automated corrective feedback program (Grammarly): A study of effects on the writing skills of Saudi EFL undergraduates. *Migration Letters*, 20(S9), 563–582. <https://doi.org/10.59670/ml.v20iS9.4823>
- Fitria, T. N.** (2023). The use of Grammarly in academic writing: Benefits and drawbacks for EFL students. *Journal of Language Teaching and Research*, 14(3), 567–578. <https://doi.org/10.17507/jltr.1403.13>
- Gasaymeh, M. M., Beirat, M. A., & Abu Qbeita, A. A.** (2024). University students’ insights of generative artificial intelligence (AI) writing tools. *Education Sciences*, 14(10), 1062. <https://doi.org/10.3390/educsci14101062>
- Groves, M., & Mundt, K.** (2023). Grammarly and student writing: Evaluating automated corrective feedback. *Journal of Second Language Writing*, 62, 101134. <https://doi.org/10.1016/j.jslw.2023.101134>
- Kasneci, E., Kessler, F. A., Schmid, U., Bannert, M., Dementieva, D., Fischer, F., & Kasneci, G.** (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- Khalil, M., & Er, E.** (2023). Generative AI and academic integrity: Implications for higher education. *International Journal of Educational Technology in Higher Education*, 20(3), 55–72. <https://doi.org/10.1186/s41239-023-00434-9>
- Lee, J., & Liu, Y.** (2024). EFL students’ engagement with AI-based feedback in academic writing tasks. *System*, 120, 103982. <https://doi.org/10.1016/j.system.2023.103982>

O'Connor, J. (2023). ChatGPT in the classroom: A case study of student use and perceptions in academic writing. *Innovations in Education and Teaching International*, 60(4), 467–482. <https://doi.org/10.1080/14703297.2023.2256721>

Ramadhani, I. G. A., & Budiarta, I. N. (2024). The effectiveness of Grammarly in improving EFL students' writing accuracy. *Indonesian Journal of Applied Linguistics*, 14(2), 88–102. <https://doi.org/10.17509/ijal.v14i2.52399>

Sailer, M., & Valero, M. (2023). Ethical challenges of ChatGPT in higher education: A review. *Higher Education Research & Development*, 42(5), 877–896. <https://doi.org/10.1080/07294360.2023.2234569>

Yunus, M. M., Tuan, J. L., & Arifin, N. (2023). AI-assisted writing feedback: Integrating Grammarly into EFL classrooms. *Malaysian Journal of Learning and Instruction*, 20(1), 1–25. <https://doi.org/10.32890/mjli2023.20.1.1>

Zhang, Y., & Li, H. (2023). Exploring ChatGPT as a tool for academic writing support: Opportunities and challenges. *Computers and Composition*, 69, 102120. <https://doi.org/10.1016/j.compcom.2023.102120>