

# Writing Quality and Revision Practices in Digital Library Writing Support Services: Examining ChatGPT as an AI-Based Information Tool

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## Abstract

*This research investigated the impact of ChatGPT on writing quality and revision practices within the context of digital library support services in academic information environments. Within library and information science, digital libraries have evolved beyond content provision to offer AI-driven services, including assistance with academic writing, feedback mediation, and research facilitation. Consequently, the interaction between users and these AI-enabled tools is critical for the effective design and management of digital library offerings. A mixed-methods approach was employed, combining quantitative and qualitative data from 40 intermediate English language learners at a Saudi university. Participants were divided into experimental groups, which utilised digitally mediated writing support spaces, and a control group, matched for writing ability and experience, that did not use such resources. Data collection comprised assessments of writing quality, analyses of revision strategies, and participant reflections, enabling evaluation of both textual outputs and user engagement with feedback and information-seeking behaviour. Findings demonstrate that ChatGPT*

*significantly enhances writing quality in digital library contexts, particularly in vocabulary acquisition, grammatical accuracy, and structural organisation. Additionally, the tool facilitates autonomous revision by offering iterative feedback and encouraging self-monitoring, aligning with contemporary digital library service models. However, improvements in coherence were modest, suggesting limitations in the AI's capacity to interpret cultural and contextual subtleties inherent in academic writing.*

**Keywords:** Digital Library, ChatGPT, Second Language Acquisition, Revision Processes, Writing Quality, AI Feedback.

## Introduction

The integration of Artificial Intelligence (AI) into education has substantially transformed learning environments, particularly in language education, where tools such as ChatGPT are redefining how learners engage with language acquisition (Kherbouche, 2025). In technologically advanced countries, where digital adoption is widespread, ChatGPT has been incorporated into mainstream pedagogy, especially in second language (L2) writing instruction. The platform provides real-time, personalised feedback on vocabulary, grammar, organisational structure, and coherence (Bacon and Kraus, 2025; Waked et al., 2024). For instance, studies from the United States, the United Kingdom, and South Korea, where AI integration in classrooms has been extensively analysed, report notable improvements in learners' writing

abilities, particularly in vocabulary expansion and error correction (Bok and Cho, 2023; Yang, 2024). These findings suggest that AI-driven tools like ChatGPT can enhance writing quality and foster the development of revision and proofreading strategies.

Despite its promise, the adoption of AI in education faces challenges, including insufficient resources and limited digital transformation capacity (Aldowsari and Aljebreen, 2024). Research from across the globe emphasises the need for integrating AI technologies into education, particularly in developing nations, as a mechanism to accelerate educational growth (Celik et al., 2025). However, both teachers and students often lack the proficiency to effectively utilise these tools. In countries such as Kenya and Vietnam, efforts to incorporate AI into language education are ongoing, yet these nations still trail behind more technologically advanced countries (Al-Ahdal and Hussein, 2020; Hoang, 2025; Thuong, 2025).

Within this international context, the application of AI in Saudi Arabia's educational system presents both challenges and opportunities. The Kingdom has witnessed a rapid expansion in technology usage, accompanied by significant investment in AI and digital infrastructure (Al-Ahdal and Alharbi, 2021; Dong, 2024; Ho, 2024; Zare et al., 2025). The Vision 2030 initiative emphasises the strategic role of technology in education, providing an avenue to modernise learning practices and enhance English language proficiency. Against this backdrop, ChatGPT-based writing support may benefit EFL learners in Saudi Arabia, simultaneously advancing national goals of global communication competence and digital sector development. At the local level, integrating AI-driven platforms into classrooms faces several obstacles. Despite increasing digital adoption in education, limitations remain, including inadequate teacher training, minimal exposure to technology in rural areas, and the need for curriculum reform (Haerazi et al., 2025). Additionally, traditional teacher-centred pedagogical practices constrain the effective deployment of AI tools, underscoring the importance of exploring how AI can influence various educational dimensions, including the enhancement of revision strategies and writing quality among Saudi EFL learners (Hoang, 2025; Mahande et al., 2025; Mohamed Haggag, 2023).

While AI's potential in education is recognised, there remains a gap in the literature concerning the specific effects of ChatGPT on revision practices and writing quality in EFL contexts such as Saudi

Arabia. Although multiple studies have investigated the role of AI feedback in global writing tasks (Yan, 2023; Zare et al., 2025), research examining its impact on learners' independent revision strategies is limited (Albadarin et al., 2024; Shi et al., 2025). Moreover, although evidence demonstrates that AI tools improve aspects of writing such as grammar, vocabulary, and coherence, there is insufficient investigation into how skills gained from guided AI-assisted revisions transfer to independent writing (Liu, 2025; Mahande et al., 2025). This research gap motivates the current study, which focuses on how ChatGPT-facilitated writing activities affect learners' writing quality both immediately and over time, particularly in developing self-reflection abilities and their application to autonomous writing tasks. In doing so, the study contributes to ongoing research on AI integration in language learning and writing instruction for EFL learners.

## Objectives of the Study

This study sets out to achieve the following objectives in investigating the impact of ChatGPT-based writing activities on EFL learners' revision practices and writing proficiency:

1. To examine the influence of ChatGPT-mediated writing tasks on the ways in which EFL learners revise their compositions.
2. To assess the degree to which engagement with ChatGPT-based exercises enhances the overall quality of EFL learners' writing.
3. To identify which specific dimensions of writing quality are most strongly affected by the implementation of ChatGPT-supported activities in foreign language learning.

These objectives align with emerging research that highlights the potential advantages of AI tools in language acquisition, particularly for writing development (Bergil, 2025; Bok and Cho, 2023). By concentrating on both revision strategies and writing quality, the study aims to offer a comprehensive understanding of ChatGPT's role in EFL writing instruction.

## Literature Review

### Theoretical Review

Feedback has long been recognised as a critical

component in language learning, particularly in relation to writing revision. Constructivist learning theories, notably those advanced by Vygotsky and Cole (1978), emphasise the importance of feedback in supporting cognitive development. According to Vygotsky's Zone of Proximal Development (ZPD), learners achieve optimal progress when presented with tasks slightly beyond their current capabilities, provided they receive appropriate guidance (Vygotsky and Cole, 1978). Within this framework, ChatGPT functions as a scaffolding tool, enabling learners to revise and enhance their writing independently while still receiving the necessary support to facilitate meaningful improvement (Albadarin et al., 2024).

In addition, the principles of self-regulated learning (SRL) underscore the capacity of learners to actively manage their learning through goal-setting, self-monitoring, and self-reflection. ChatGPT aligns with this framework by delivering contextual, immediate feedback that encourages learners to critically evaluate and apply suggestions in successive revisions (He, 2025; Liu, 2025). Through this iterative process, the platform nurtures self-disciplined writers who can autonomously identify and correct errors, progressively refining their writing skills. Another relevant theoretical perspective is the sociocultural theory (SCT) of language learning, which posits that language acquisition is shaped by social interaction and cultural context (Lantolf et al., 2014). In the case of ChatGPT, learners interact with an AI system that serves as a quasi-social interlocutor, providing feedback and prompting students to modify their texts in accordance with its guidance, thus simulating elements of social collaboration in learning.

## **Empirical Review**

### **Writing Quality and ChatGPT**

Feedback plays a central role in enhancing EFL learners' writing quality, and its impact is amplified when delivered through technological tools such as ChatGPT. Several studies investigating ChatGPT's role in second language writing report improvements in grammatical accuracy, vocabulary variety, and textual coherence (Bacon and Kraus, 2025). In particular, Bacon and Kraus (2025) found that students who employed ChatGPT for writing review demonstrated marked gains in their writing performance. This finding is consistent with Barrios-Beltran (2025), who observed that learners using ChatGPT for revising

their compositions were more precise in grammar usage and exhibited greater lexical diversity, thereby benefiting from effective iterative feedback. Yan (2023) further supports this, noting that ChatGPT assists learners in promptly identifying errors during writing, enabling timely and efficient corrections.

The benefits of ChatGPT are not limited to English. Barrios-Beltran (2025) reported similar outcomes in Spanish as a second language, highlighting improvements in grammar correction and vocabulary selection, a result corroborated by additional research (Shi et al., 2025; Yang, 2024). Further evidence from Wang et al. (2024), Hoang (2025), and Waked et al. (2024) demonstrates that engagement with ChatGPT substantially enhances writing quality. For instance, Huang's study on Vietnamese EFL learners revealed that using ChatGPT for text review led to significant improvements in both grammar application and vocabulary selection. Waked et al. (2024) also confirmed that the immediate feedback provided by ChatGPT enables learners to rectify errors before they become habitual, thereby significantly enhancing the overall quality of their written work.

### **Revision Strategies and ChatGPT**

Regular and systematic revision of written work is essential for the development of writing proficiency. ChatGPT has been identified as an effective tool for facilitating students' text review. Kavanagh (2025) observed that learners who utilised ChatGPT engaged in a more structured revision process, extending beyond grammar to include complex sentence structures, clarity, and lexical choice. Similarly, Bok and Cho (2023) found that EFL learners in Korea demonstrated a greater tendency toward reflective writing when using ChatGPT, thereby enhancing their skills through iterative editing.

Tsai et al. (2024) further examined ChatGPT's influence on revision strategies, reporting that interactions with the tool promoted a dynamic editing process characterised by continual acceptance, rejection, and modification of AI-generated suggestions. This iterative engagement increased learners' immersion in the text and provided them with greater autonomy and confidence to revise their drafts. While teachers remain central to the facilitation of learning, traditional feedback often focuses on minor corrections and lacks the depth needed to foster comprehensive revision. In contrast, ChatGPT feedback exhibits higher levels of professional

guidance and supports more sophisticated revision practices (He, 2025). The platform also promotes the development of self-reflection skills, enabling learners to evaluate their writing critically and substantiate their arguments. Feedback from ChatGPT helps students identify areas requiring improvement (Arefian et al., 2024), which not only enhances writing quality but also strengthens learners' capacity to self-regulate their revision process, fostering greater independence in their writing development.

### **Learner Autonomy and ChatGPT**

One of the primary advantages of ChatGPT in L2 writing instruction is its capacity to promote learner autonomy. Studies by Kherbouche (2025) and Mahande et al. (2025) indicate that students who engaged in revisions using ChatGPT reported heightened motivation and increased confidence in their writing abilities. ChatGPT supports independent learning by providing learners with immediate, personalised feedback, allowing them to enhance their writing without relying solely on instructor input (Liu, 2025). Furthermore, the tool encourages learners to engage with their compositions in a self-directed manner, fostering SRL behaviours such as goal-setting, self-monitoring, and error correction (Tsai et al., 2024). Unlike traditional coursework models, where learners must wait for teacher feedback, ChatGPT offers continuous interaction and real-time corrections, thereby supporting sustained, autonomous learning (Kavanagh, 2025). This shift towards independent learning is particularly valuable in educational contexts where individual teacher guidance is limited, enabling learners to take charge of their learning process and act as their own facilitators (Zare et al., 2025).

### **Difficulties and Shortcomings of ChatGPT in Writing Instruction**

Although ChatGPT offers considerable potential for enhancing L2 writing skills, empirical research highlights several challenges and limitations associated with integrating AI feedback into writing instruction. A primary concern is the risk of over-reliance on AI-generated feedback, which may hinder learners from developing essential revision and critical evaluation skills. Waked et al. (2024) and Kherbouche (2025) note that excessive dependence on ChatGPT can prevent learners from internalising writing principles, as they may follow AI suggestions without fully understanding the underlying rules. This reliance can encourage

a passive learning style, reducing opportunities for autonomous and reflective writing practices crucial for academic and professional contexts. Such passivity can limit learners' engagement with problem-solving and independent reflection on writing tasks (Bergil, 2025; Topal, 2025).

Contextual limitations of AI feedback represent another major challenge. ChatGPT and similar AI applications rely on pre-trained algorithms that may not always provide feedback tailored to specific cultural or situational contexts. In nuanced or culturally sensitive writing tasks, AI-generated suggestions may be syntactically correct but semantically inappropriate, potentially resulting in misunderstandings or errors that would not occur under conventional feedback methods (Altun, 2024; Tsai et al., 2024). For example, when learners utilise ChatGPT to enhance vocabulary or sentence construction, the platform may propose grammatically valid but contextually unsuitable options. This limitation is particularly evident in texts requiring cultural awareness or discipline-specific expertise, as AI tends to provide generalized guidance rather than targeted, context-sensitive recommendations (Ho, 2024; Yan, 2023). Learners may inadvertently accept inappropriate suggestions, thereby compromising the accuracy and quality of their work.

A further drawback is ChatGPT's limited ability to diagnose the underlying causes of learner errors. While the system can detect grammatical mistakes or suggest alternative vocabulary, it does not analyse why the errors occur. Kavanagh (2025) and He (2025) observed that AI feedback often addresses mistakes in isolation, without offering diagnostic insights into their cognitive or linguistic origins. Unlike human instructors, who can engage in personalised discussions to address specific learning difficulties, ChatGPT provides feedback based on general patterns in data. This lack of diagnostic reasoning may result in superficial corrections that fail to deepen learners' understanding of grammar, syntax, or writing conventions. For instance, ChatGPT can highlight a subject-verb agreement error but does not explain how interlingual interference or other cognitive factors may have caused it (Bergil, 2025; Kherbouche, 2025). Ethical and data protection concerns have also emerged as critical considerations in the use of ChatGPT in educational contexts. The system relies on processing large datasets, raising questions about the privacy and security of student-generated content. Texts submitted to ChatGPT may

include personal or sensitive information, and the protection of such data depends on the platform's privacy safeguards (Mahande et al., 2025).

These concerns are compounded when AI tools are integrated into learning environments. Students may inadvertently share personal or culturally sensitive information, and AI algorithms may reproduce or amplify biases present in their training data. Research indicates that AI systems can reinforce gender, racial, or socioeconomic biases, often without making these biases apparent in outputs (Hoang, 2025; Zare et al., 2025). In some cases, AI suggestions may reflect ideological or stereotypical positions, which could disadvantage learners from diverse backgrounds (Altun, 2024; Kherbouche, 2025). Therefore, in ChatGPT-supported writing instruction, educators must carefully monitor data security and critically evaluate the appropriateness, accuracy, and transparency of AI-generated feedback.

## Research Gap

The empirical evidence reviewed above highlights both the potential benefits and the limitations of ChatGPT in supporting L2 writing development. Despite concerns regarding over-reliance on AI feedback and occasional inadequacies in context-sensitive guidance, ChatGPT offers significant opportunities for enhancing learners' writing management, revision practices, and sense of agency. While substantial research has explored ChatGPT's effectiveness in L2 contexts, studies specifically addressing its application in EFL settings remain limited. This research aims to address these gaps by investigating how ChatGPT-based writing activities influence the revision strategies and writing quality of EFL learners in Saudi Arabia.

## Methodology

### Research Design

The experimental design was employed in this study to examine the effects of ChatGPT-facilitated writing practice on the revision behaviours of L2 learners and its impact on writing quality. Participants were assigned to two groups: the EG, which utilised ChatGPT for revision support, and the CG, which relied on conventional instructor feedback. Both groups completed identical writing tasks, allowing for a comparison of writing quality and revision strategies. The EG received guidance through ChatGPT on

how to perform effective revisions, whereas the CG obtained traditional teacher feedback. In addition, a questionnaire was administered, and semi-structured interviews were conducted to explore participants' perceptions of the tools and their experiences during the revision process.

### Selection of the Participants

The study included 40 students from Al Baha University enrolled in an intermediate English course. Participants were evenly divided into two groups, with 20 learners in the EG and 20 in the CG. Screening ensured comparable levels of English proficiency and prior writing experience. All participants were fully informed about the study objectives, and formal consent was obtained before participation. None of the participants had previously used ChatGPT for writing revision, ensuring that observed improvements were attributable solely to the intervention.

### Methods of Data Collection

Data were gathered through writing samples, a questionnaire, and semi-structured interviews, as detailed below.

### Writing Samples

To measure differences in writing quality before and after ChatGPT use, writing samples were collected at two stages. Participants completed a descriptive writing task in English. The EG received feedback on grammar, vocabulary, and sentence construction via ChatGPT after submitting their first draft. The CG, in contrast, received conventional instructor feedback. Both groups submitted second drafts, which were evaluated for improvements in writing quality. By comparing these samples, it was possible to identify differences in grammar, vocabulary range, coherence, and overall organisation, thereby assessing whether ChatGPT enhanced writing quality relative to traditional feedback methods.

### Questionnaire

A questionnaire was administered to collect quantitative data on participants' perceptions of the revision process, their confidence in writing, and the effectiveness of ChatGPT. The instrument measured the frequency of ChatGPT use during revision, levels of confidence before and after its use, perceived improvements in writing quality, and the effect of

ChatGPT on engagement and motivation in the writing task. Responses were recorded using a Likert scale, and all data were statistically analysed to identify trends in participants' attitudes and perceptions regarding the use of ChatGPT as a tool for writing revision (Table 1). Table 1 displays the internal consistency of the different constructs included in the questionnaire, measured using Cronbach's alpha. The results indicate generally acceptable levels, reflecting robust internal consistency. Since the overall alpha values exceeded 0.70, these findings suggest that the questionnaire employed in this study demonstrates satisfactory reliability across the various constructs, thereby supporting the dependability of the collected data.

**Table 1:** Reliability of the Questionnaire.

Construct	Cronbach's Alpha	No. of Items
Frequency and Manner of ChatGPT Use	0.728	10
Revision Strategies	0.780	7
Perceived Writing Quality	0.803	7
Attitudes and Acceptance	0.721	6
Challenges and Limitations	0.754	6

### Semi-Structured Interviews

A subset of participants from the EG was interviewed to collect qualitative insights regarding their experiences using ChatGPT for writing exercises. The semi-structured interviews were designed to examine several key themes: participants' overall experiences with ChatGPT in the revision process, the specific writing components (grammar, vocabulary, and organisation) affected by ChatGPT feedback, the challenges they encountered while using the tool and the strategies employed to overcome them, and a comparison between ChatGPT feedback and traditional instructor feedback. These interviews facilitated an in-depth exploration of both metacognitive and cognitive processes during revision activities. All interviews were audio-recorded, transcribed, and subsequently subjected to thematic analysis to identify recurring patterns and to gain a deeper understanding of how participants engaged with ChatGPT throughout their revision practices.

### Analysis and Results

This section presents an analysis of data obtained from the questionnaires, writing samples, and semi-structured interviews. The findings are discussed in alignment with the research objectives, with results displayed in tables accompanied by

explanatory notes. The collected data were used to evaluate the influence of ChatGPT-based writing exercises on L2 learners' revision strategies and writing quality, with a particular emphasis on the effectiveness of AI-mediated feedback in improving learners' writing proficiency.

### Questionnaire Findings

Table 2 presents the results of the questionnaire administered to participants. The findings reveal students' perceptions regarding the influence of ChatGPT-based writing exercises on their writing practices, revision approaches, and overall sense of self-efficacy. Table 2 illustrates the extent of ChatGPT engagement in students' writing activities. It highlights patterns and subtle behaviours in the use of AI tools within academic writing tasks. A considerable proportion of students reported actively employing ChatGPT at various stages of their writing process. The analysis indicates that ChatGPT was widely used by participants. Approximately 55% reported using it consistently, 20% used it frequently, and 25% had never used it. For many learners, ChatGPT functioned not merely as a grammar-checking tool but as an integral component for idea generation, drafting, and text refinement. In essence, it supported the development of their thoughts and the structuring of their writing. Nearly three-quarters of students consistently incorporated ChatGPT's recommendations into their drafts, with a mean rating of 4.55. The feedback provided by ChatGPT was regarded as effective, timely, and a well-structured complement to students' texts.

Despite this high usage, students exercised discernment; around 60% did not adopt suggestions without comparing them with their own judgement, balancing AI support with individual writing style. Furthermore, there was widespread agreement regarding the value of ChatGPT in English writing: 85% of participants reported regular use, with a mean rating of 4.75, demonstrating that this AI tool is considered essential for academic writing. Interestingly, ChatGPT was not used solely for error correction. Almost half of the respondents indicated they consistently used it for brainstorming when initiating a new writing task, while 35% used it occasionally for this purpose. This demonstrates that ChatGPT has become a valuable aid in the idea-generation phase. Regarding time investment, 90% of students reported spending considerable or

moderate amounts of time interacting with ChatGPT, establishing an iterative dialogue in which feedback was critically evaluated and applied throughout the

drafting process. ChatGPT’s flexibility allows it to be employed in both academic and informal writing contexts.

**Table 2:** Frequency and Manner of ChatGPT Use.

No	Statement	Never	Rarely	Sometimes	Often	Always	Std. Deviation	Mean
1	I consult ChatGPT at multiple stages throughout the writing process.		25.0%	0	20.0%	55.0%	1.2763	4.05
2	I integrate ChatGPT suggestions directly into my writing drafts.			15.0%	15.0%	70.0%	0.75915	4.55
3	I often compare ChatGPT suggestions with my own understanding before making revisions.			15.0%	25.0%	60.0%	0.75915	4.45
4	I regularly use ChatGPT for my English writing tasks.			10.0%	5.0%	85.0%	0.63867	4.75
5	I rely on ChatGPT for generating ideas when I start writing.		5.0%	10.0%	35.0%	50.0%	0.8645	4.3
6	I spend a significant amount of time interacting with ChatGPT during each writing task.	5.0%		5.0%	30.0%	60.0%	0.99472	4.4
7	I use ChatGPT for academic writing.			30.0%	25.0%	45.0%	0.87509	4.15
8	I use ChatGPT for informal writing.		5.0%	10.0%	25.0%	60.0%	0.88258	4.4
9	I use ChatGPT mostly without teacher guidance.		10.0%	20.0%	25.0%	45.0%	1.05006	4.05
10	I use ChatGPT to help revise my writing immediately after drafting.		10.0%	15.0%	25.0%	50.0%	1.03999	4.15

In terms of independence, participants used ChatGPT without teacher intervention always (45%), sometimes (25%), and rarely (20%), reflecting a balance between autonomous learning and guided instruction. Learners appreciated AI support while still valuing teacher oversight, especially for complex

writing tasks. Nearly half of the students used ChatGPT’s immediate review function after drafting as a direct feedback mechanism, while one-quarter did so occasionally. This rapid feedback facilitated iterative text refinement, aligning with best practices in writing instruction (Table 3).

**Table 3:** Revision Strategies Used.

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Std. Deviation	Mean
1	ChatGPT encourages me to revise my writing.	5.0%	5.0%	20.0%	30.0%	40.0%	1.14593	3.95
2	After using ChatGPT, I pay greater attention to the structure of my essays.			15.0%	45.0%	40.0%	0.71635	4.25
3	I review and change my vocabulary choices after ChatGPT feedback.		5.0%	5.0%	20.0%	70.0%	0.82558	4.55
4	I identify my common writing mistakes using ChatGPT.			20.0%	25.0%	55.0%	0.81273	4.35
5	ChatGPT helps me organize my ideas more clearly when revising.	10.0%		15.0%	35.0%	40.0%	1.23438	3.95
6	I reflect on my arguments and try to improve their logic after receiving ChatGPT suggestions.			15.0%	15.0%	70.0%	0.75915	4.55
7	I make both surface-level (grammar) and deep-level (content) revisions after using ChatGPT.			5.0%	20.0%	75.0%	0.57124	4.7

The impact of ChatGPT on students’ writing style and self-revision capabilities was highly evident. Nearly 70% of respondents strongly agreed, while the remaining 30% agreed, that ChatGPT encouraged them to engage more carefully and thoughtfully with their writing. The mean score of 3.95 further supports this, indicating that the tool fosters deeper and more effective revision practices rather than superficial corrections. Regarding essay structure, ChatGPT also had a substantial effect. A total of 85%

of participants reported paying greater attention to structuring their essays when using the tool, with a mean rating of 4.25. This suggests that AI feedback enhanced students’ awareness of how to organise their ideas coherently. In summary, ChatGPT not only corrects grammatical errors but also prompts learners to consider the logical arrangement of their content, thereby improving overall text coherence.

Vocabulary development emerged as another significant benefit. Approximately 70% of participants

strongly indicated that they revised and reconsidered their word choice after interacting with ChatGPT. The findings demonstrate that the tool aids in diversifying vocabulary and refining language use, encouraging students to employ synonyms and rephrase ideas to create more nuanced and sophisticated writing. In terms of error detection, 80% of respondents reported that ChatGPT helped them learn from their mistakes, supporting the development of metacognitive skills and increased awareness of their writing proficiency. However, 10% of participants did not perceive this benefit, suggesting individual differences in how

learners respond to AI feedback or occasional limitations in the AI's comprehension of complex arguments. Finally, the concept of "reflecting on argumentative logic" was strongly endorsed. Around 85% of students agreed or strongly agreed that they actively evaluated the reasoning and coherence of their arguments after receiving ChatGPT recommendations. This demonstrates that ChatGPT not only enhances linguistic accuracy but also contributes meaningfully to the assessment and refinement of ideas, functioning as an effective partner in developing structured and coherent arguments (Table 4).

**Table 4:** Perceived Writing Quality.

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Std. Deviation	Mean
1	My overall writing quality has improved since I started using ChatGPT.				35.0%	65.0%	0.48936	4.65
2	My essays are more coherent and logically connected after using ChatGPT-based exercises.			10.0%	20.0%	70.0%	0.68056	4.6
3	I make fewer grammatical mistakes after revising with ChatGPT.	5.0%	5.0%	10.0%	30.0%	50.0%	1.13671	4.15
4	I use more varied and appropriate vocabulary in my writing thanks to ChatGPT.			5.0%	25.0%	70.0%	0.58714	4.65
5	ChatGPT feedback helps me meet assignment requirements more accurately.		5.0%	15.0%	15.0%	65.0%	0.94032	4.4
6	My writing has become more fluent and natural after ChatGPT-based practice.			5.0%	20.0%	75.0%	0.57124	4.7
7	The overall organization of my writing improved because of ChatGPT suggestions.	5.0%	5.0%	10.0%	25.0%	55.0%	1.15166	4.2

The integration of ChatGPT for writing review and feedback led to clear enhancements in students' written outputs. According to the statistical analysis, 65% of participants strongly affirmed, and the remaining 35% agreed, that their writing quality improved through the use of the AI tool. This outcome highlights the dual advantage of ChatGPT: it provides learners with effective scaffolding for refining their texts, while simultaneously enabling instructors to evaluate submissions more accurately and efficiently. Respondents also reported that exercises guided by ChatGPT positively influenced multiple dimensions of writing. These included the coherence and logical sequencing of essays, grammatical precision, lexical richness, and the overall fluency and naturalness of expression. Furthermore, students indicated that the AI-supported tasks facilitated compliance with assignment requirements and enhanced the overall organisation of their work, with mean scores consistently above 4.0. The persistent high ratings, coupled with the strong consensus among participants, indicate that ChatGPT functions as a holistic writing

support system, simultaneously strengthening micro-level components such as grammar and word choice, and macro-level attributes including text structure, argument coherence, and fulfilment of writing objectives.

Table 5 illustrates notable changes in students' perceptions and evaluations of ChatGPT as a tool for writing. The majority of participants (80%) considered ChatGPT beneficial for enhancing their writing, reflected in a positive overall mean score of 4.4. Despite this, approximately 20% of respondents expressed disagreement or a neutral stance, suggesting that a minority of learners held reservations about its usefulness. An additional observation is that ChatGPT appeared to bolster students' confidence in their English writing abilities. Specifically, 60% strongly agreed and 15% agreed that the tool increased their confidence, yielding a mean score of 4.25. The standard deviation of 1.07 indicates a relatively wide variation in these responses.

Regarding engagement with ChatGPT in assignments, 35% strongly agreed and 35% agreed that

they enjoyed using it, while 10% disagreed or remained neutral. This mixed yet generally positive attitude implies that, while the majority found ChatGPT appealing and helpful, some learners experienced a less favourable impression. Concerning the integration of ChatGPT alongside teacher feedback, data in Table 5 show that most participants acknowledged its value

as a complement to traditional instruction, with 40% strongly agreeing and 30% agreeing, resulting in a mean score of 3.95. Furthermore, 70% of students highlighted the usefulness of ChatGPT in comparison to those who did not adopt it, producing a mean score of 4.65 and demonstrating strong acceptance of the AI tool within the writing process.

**Table 5:** Attitudes and Acceptance.

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Std. Deviation	Mean
1	I find ChatGPT to be a valuable tool for improving my writing.			20.0%	20.0%	60.0%	0.82078	4.4
2	Using ChatGPT makes me more confident in my English writing abilities.		10.0%	15.0%	15.0%	60.0%	1.06992	4.25
3	I enjoy working with ChatGPT for my assignments.	10.0%		20.0%	35.0%	35.0%	1.22582	3.85
4	I am motivated to explore new AI applications for language learning.	10.0%		20.0%	35.0%	35.0%	1.22582	3.85
5	I believe ChatGPT is a good supplement to teacher-provided feedback.	15.0%		15.0%	30.0%	40.0%	1.09904	3.95
6	I would recommend ChatGPT-based writing tasks to fellow learners.			5.0%	25.0%	70.0%	0.58714	4.65

An intriguing observation is the average score of 4, indicating agreement or strong agreement, that the support provided by ChatGPT was sometimes unclear or ineffective. This implies that, although ChatGPT offered substantial assistance, learners experienced difficulty interpreting its comments and suggestions, which can be attributed to responses that were incomplete, fragmented, or expressed in overly complex language. Furthermore, almost half of the participants considered ChatGPT essential, whereas

approximately 30% remained neutral regarding the applicability of its guidance to their work. This highlights instances where ChatGPT may struggle to interpret academic nuances or intricate contexts, leading to feedback that does not fully align with the intended objectives or assignment criteria. Concerns about over-dependence were evident, with an average rating of 4.2 and 45% of students expressing significant apprehension that learners might rely excessively on AI for revision (Table 6).

**Table 6:** Challenges and Limitations.

No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Std. Deviation	Mean
1	I find ChatGPT suggestions unclear to use.		20.0%	5.0%	30.0%	45.0%	1.1698	4
2	ChatGPT feedback is not always relevant to my writing context.		5.0%	15.0%	30.0%	50.0%	0.91047	4.25
3	I worry about becoming too dependent on ChatGPT for revision.			25.0%	30.0%	45.0%	0.83351	4.2
4	It is difficult to decide which ChatGPT suggestions to accept or ignore.		10.0%	30.0%	15.0%	45.0%	1.09904	3.95
5	ChatGPT occasionally produces inappropriate or non-native-like language.		5.0%	25.0%	30.0%	40.0%	0.94451	4.05
6	I am concerned about privacy or data security when using ChatGPT for writing assignments.			35.0%	30.0%	35.0%	0.8584	4

Participants occasionally reported confusion when determining how to implement ChatGPT's suggestions, particularly in deciding which recommendations to accept or disregard. Nearly half of the students indicated difficulty in distinguishing between useful and less relevant advice, pointing

to a need for clearer guidance in understanding and applying AI feedback effectively. Additionally, about 45% of respondents observed that ChatGPT sometimes generated irrelevant or contextually inappropriate language, while 30% did not encounter such issues. These findings underline concerns about the precision,

relevance, and clarity of AI-generated feedback. Data privacy and security issues also emerged prominently, with 65% of students expressing concern and an average score of 4, indicating heightened awareness and apprehension regarding the handling and storage of personal information when using ChatGPT as a writing support tool.

Table 7 illustrates the variations in students' perceptions of writing with ChatGPT according to gender. Across all five evaluated variables, female students consistently reported higher scores, ranging from 4.29 to 4.73, compared with male students, whose scores ranged from 3.93 to 4.31. Statistical analysis confirms that these differences favour female participants, with a p-value below 0.05 indicating that the results are statistically significant. Overall, this suggests that female students in this sample experienced a more positive interaction with ChatGPT and perceived greater benefits from using it in their writing tasks than their male counterparts.

**Table 7:** Mean Comparison of Perception Based on Gender Variable.

Gender		N	Mean	Std. Deviation	Sig
First	Male	12	4.0667	0.44381	0.005
	Female	8	4.7125	0.45178	
Second	Male	12	4.0833	0.24712	0.000
	Female	8	4.6964	0.36171	
Third	Male	12	4.3095	0.32137	0.010
	Female	8	4.7321	0.31887	
Fourth	Male	12	3.9444	0.51900	0.044
	Female	8	4.4792	0.57347	
Fifth	Male	12	3.9306	0.39860	0.194
	Female	8	4.2917	0.65918	

As presented in Table 8, students within the 22–24 age range consistently achieved higher scores across all five constructs compared with those aged 18–21. Comparable patterns were observed across specific domains, with scores such as 4.20 versus 4.20, 4.46, and 4.03 versus 4.28, indicating a trend of older students perceiving or benefiting more from the ChatGPT writing activities.

Older students reported greater usefulness of ChatGPT in enhancing their writing abilities. This pattern likely reflects their more developed understanding of learning processes and metacognitive awareness. They typically possess stronger cognitive capacities, which facilitate more effective interaction with ChatGPT, and they are inclined to utilise all available resources to address learning challenges. Conversely, younger students achieved lower scores, which may be attributed to their limited familiarity

with performance-enhancing tools such as ChatGPT, or because their writing competence is still developing, making it harder to fully capitalise on the advantages offered by these tools. It is important to emphasise that none of these differences reached statistical significance, as all p-values exceeded 0.1. Overall, these findings indicate that older learners are more predisposed to engage actively with technological aids like ChatGPT. Recognising these variations in educational practice can guide the design of targeted interventions and support mechanisms, ensuring the effective integration of AI tools across different learner stages.

**Table 8:** Mean Comparison of Perception Based on Age Variable.

Construct		N	Mean	Std. Deviation	
First	18-21	10	4.2100	0.56263	0.357
	22-24	10	4.4400	0.52536	
Second	18-21	10	4.2000	0.46754	0.180
	22-24	10	4.4571	0.34863	
Third	18-21	10	4.4286	0.41513	0.568
	22-24	10	4.5286	0.35025	
Fourth	18-21	10	4.0333	0.56547	0.358
	22-24	10	4.2833	0.61889	
Fifth	18-21	10	3.9167	0.60477	0.192
	22-24	10	4.2333	0.42455	

### Analysis of Writing

The writing samples were evaluated following the established writing rubric, which focused on four critical dimensions: vocabulary, grammar, organisation, and coherence. The table below presents a comparative analysis of the pre- and post-revision scores for both the EG and the CG. The analysis of data presented in Table 9, comparing the CG and EG during the pre-test phase, indicates no statistically significant differences in writing performance across the four assessed dimensions: vocabulary, grammar, organisation, and coherence prior to the intervention. Regarding vocabulary, the CG obtained a mean score of 2.20, while the EG scored 2.00, with a p-value of 0.324, demonstrating comparable lexical competence between the groups. Similarly, both groups exhibited identical performance in grammatical accuracy, each attaining a mean of 1.45, with a p-value of 1.000, confirming equivalent starting proficiency.

Measures of organisation and coherence also reflected similar baseline levels. The EG slightly outperformed the CG in organisation, with mean scores of 1.50 and 1.35, respectively, and in coherence, with

means of 1.35 versus 1.25. However, these differences were not statistically significant, as indicated by p-values of 0.432 and 0.503, respectively. Qualitative examination of the preliminary test across all writing dimensions revealed relatively low average scores. Nonetheless, these findings highlight considerable

potential for improvement in vocabulary, grammatical accuracy, and overall writing quality, ultimately supporting more organised and coherent compositions. This underscores the importance of establishing an environment conducive to the structured integration of ChatGPT into the writing process.

**Table 9:** Writing Quality Comparison of CG and EG in the Pre-Test.

Group		N	Mean	Std. Deviation	Sig
Vocabulary	Control	20	2.2000	0.69585	0.324
	Experimental	20	2.0000	0.56195	0.324
Grammar	Control	20	1.4500	0.51042	1.000
	Experimental	20	1.4500	0.51042	1.000
Organization	Control	20	1.3500	0.58714	0.432
	Experimental	20	1.5000	0.60698	0.432
Coherence	Control	20	1.2500	0.44426	0.503
	Experimental	20	1.3500	0.48936	0.503

Table 10 illustrates the impact of ChatGPT-assisted writing by comparing post-intervention outcomes with pre-test results. The data present the mean scores of the EG before the introduction of ChatGPT and the improvements observed after

employing ChatGPT-based support. These values highlight the measurable enhancements in writing performance attributable to AI-assisted revision, demonstrating the efficacy of integrating ChatGPT into the learners’ writing process.

**Table 10:** Writing Quality Comparison of CG and EG in Pre-Test.

Group		N	Mean	Std. Deviation	
Vocabulary	Control	20	2.9500	0.60481	0.000
	Experimental	20	4.6000	0.50262	
Grammar	Control	20	2.2000	0.41039	0.000
	Experimental	20	4.5500	0.51042	
Organization	Control	20	2.5000	0.51299	0.000
	Experimental	20	4.4500	0.75915	
Coherence	Control	20	2.3000	0.47016	0.115
	Experimental	20	2.5500	0.51042	

The data indicate that the EG attained an average score of 4.60, markedly higher than the CG, which recorded a mean of 2.95. This pronounced difference suggests that ChatGPT facilitates learners in expanding their content, employing newly acquired vocabulary, and selecting a wider range of lexical items and expressions. A similar trend was observed in grammar. Although both groups demonstrated comparable competence at the outset (see Table 9), the post-intervention results show the EG improving to 4.55, whereas the CG remained at 2.20. This finding underscores the potential of AI to aid learners in identifying and correcting errors, thereby enhancing grammatical proficiency. Regarding organisation, the EG achieved a mean score of 4.45, compared to 2.50 for the CG, reflecting ChatGPT’s role in supporting learners to produce more structured and thoughtfully organised written content. In terms of coherence, the

observed improvement showed minor differences, with a p-value of 0.115, indicating that the variation was not statistically significant. This suggests that while ChatGPT is highly effective in enhancing vocabulary, grammar, and overall design, more complex writing tasks requiring contextual understanding and deeper learning still benefit significantly from instructor guidance.

**Interviews**

The semi-structured interviews yielded qualitative data revealing that ChatGPT significantly supported students in revising their writing. Rather than merely scanning drafts superficially for obvious errors, students engaged in a more interactive and reflective revision process. One participant noted, “ChatGPT has redefined my revision process entirely. Previously, I would review my essay once or twice,

but now I rely on ChatGPT to identify grammar and clarity issues, helping me catch errors I would otherwise overlook” (Student 1). This indicates that ChatGPT enhanced the accuracy of surface-level revision while fostering a more systematic approach. Another student observed, “ChatGPT made me realise I was repeatedly making the same grammar errors, which I had previously ignored” (Student 2).

Several respondents described a transition from quick, cursory reviews to iterative, detailed revision procedures facilitated by ChatGPT. As Student 1 explained, “I now revise more thoroughly. I submit my draft to ChatGPT, receive feedback, and then amend my sentences one by one. It is far more systematic and detailed than ever before.” Student 3 further noted that they had developed the ability to assess logical progression in their writing, not merely grammatical correctness. These advanced revision practices illustrate the increasing learner autonomy fostered by ChatGPT-supported scaffolding. Feedback provided by ChatGPT was consistently regarded as informative, illustrative, and conducive to cognitive learning. Student 1 remarked, “I appreciate when it explains why something is wrong or awkward. Simply indicating an error is not helpful; I learn better when the rules of grammar are discussed and writing style suggestions are provided.” Similarly, Student 14 stated, “Synonym recommendations and rephrasing ideas are extremely valuable; they diversify my vocabulary and make my writing sound more natural.” Student 19 added, “Error highlights with simple explanations are clear and helpful.”

Across the interviews, a recurring theme was students’ growing trust in ChatGPT’s ability to identify and correct errors independently, particularly when supported by explanatory feedback. One participant commented, “When I see clarifications from ChatGPT, I can understand why I made mistakes. Now, in new drafts, I am more conscious of my weak points.” Student 15 also added, “I feel more confident editing my drafts, especially after learning grammar patterns through AI feedback.” In other words, participants demonstrated a shift from reliance on external correction towards metacognitive control over their writing. Participants also reported tangible improvements in their written work. Vocabulary expanded, sentence clarity improved, and texts became better structured. Student 1 stated, “Thanks to the feedback from ChatGPT, I received numerous comments, and my communication became faster

and clearer.” Student 2 added, “I find writing more enjoyable and meaningful.” One participant noted, “The feedback is well-organized and easy to read.” Collectively, these reflections suggest that ChatGPT contributes not only to linguistic accuracy but also to the overall quality of written communication.

However, students openly acknowledged limitations of the tool. They reported occasional errors, inappropriate language usage, and inaccurate recommendations. For instance, Student 1 stated, “Sometimes ChatGPT misses context, so suggestions can be irrelevant or overly formal.” Student 2 observed, “It occasionally proposes changes that do not align with narrative styles.” Student 3 noted, “Some AI suggestions are too formal or technical for my essays,” and Student 8 added, “Certain changes alter my intended meaning.” These responses highlight the necessity for critical engagement with AI feedback and improvements in contextual modelling. Participants emphasised that meaningful learning still depends on human guidance to interpret and contextualise ChatGPT feedback. Student 1 remarked, “AI is helpful but cannot replace the nuanced understanding teachers provide, especially for complex topics.” Student 2 added, “Teacher feedback remains essential alongside AI input,” and Student 3 concluded, “It is an excellent supplement but should not replace human teachers.” Overall, these observations underscore that, despite the evident benefits of ChatGPT, instructor support remains indispensable in EFL classrooms.

## Discussion

This section provides a detailed explanation for the research questions and demonstrates how the study achieved its aims. The discussion is organised according to each research question.

### 1. How do ChatGPT-driven writing exercises influence EFL learners’ approaches to revision?

The function of ChatGPT in writing classes is to identify errors in students’ drafts and provide actionable feedback that guides revision. Many students relied on ChatGPT from the initial stage of idea generation, returning to the tool after completing their drafts to detect and correct mistakes. ChatGPT can produce human-like text responses based on the inputs it receives, facilitating interactive engagement throughout the writing process. Students initially approached writing superficially, concentrating on grammar and vocabulary. Over time, they

adopted deeper revision strategies focusing on content development, coherence, and logical flow. Initially, they performed quick readings of their drafts, but gradually shifted to careful, sentence-level analysis. Interviews revealed that learners became more conscious of recurring mistakes, developed awareness of writing processes, and revised their assignments multiple times with attention to stylistic fluency and logical organization. The experimental group showed notable improvements in vocabulary, grammatical accuracy, and textual organization. Writing quality improved as texts became more coherent, fluent, and lexically varied. These results align with Afra and Jalali (2025), who reported that ChatGPT enhances vocabulary, grammar, and idea organisation, improving coherence, fluency, and lexical diversity. Such gains can be attributed to ChatGPT's provision of immediate, transparent, and detailed feedback that supports both syntactic and semantic development (Chen, 2025; Hwang et al., 2025).

Female and older students reported greater benefits, although Iddrisu et al. (2025) found that both male and female students perceived AI tools as effective. Qualitative observations indicated that learners' writing became more polished, professional, and structured, with smoother argumentation and natural expression. Participants regarded ChatGPT as a confidence-enhancing supplement to teacher feedback, expressed enjoyment in using it, and recommended it to peers. Zeevy-Solovey (2024) also found that ChatGPT feedback is effective for most learners. While preferences leaned toward combined teacher and ChatGPT corrective feedback, challenges included unclear or contextually irrelevant suggestions, dependency concerns, difficulty selecting suitable feedback, occasional use of non-native language, and privacy concerns. These issues emphasise the importance of guided integration. Overall, ChatGPT fosters reflective and multidimensional revision practices that promote learner autonomy and improve second-language writing quality under guided supervision.

## **2. To what extent do ChatGPT-driven writing exercises improve EFL learners' writing quality?**

Pre-test comparisons between the experimental and control groups confirmed that both groups started at equivalent levels across all writing dimensions, eliminating potential bias from pre-existing differences. The experimental group demonstrated substantial improvements in vocabulary diversity due

to the lexical suggestions provided by ChatGPT. This enabled students to integrate previously unfamiliar words, enriching their texts. Grammatical guidance from ChatGPT enhanced sentence structure and syntax mastery. Most importantly, ChatGPT facilitated logical, coherent, and interconnected written ideas, ensuring fluency and clarity of expression. Behforouz and Al Ghaithi (2024) similarly reported that ChatGPT simplifies complex grammar and provides guidance that supports lexical cohesion and smoother writing.

## **3. Which elements of writing quality are most at-risk when using ChatGPT-driven exercises in EFL acquisition?**

The adoption of AI-driven approaches like ChatGPT significantly improved students' vocabulary, making it clearer, more precise, and more varied. Professionalism in writing emerged as reported by interviewees. Grammatical proficiency also increased due to the analytical feedback and structured suggestions provided by ChatGPT, enabling clear and fluent writing. Paragraph organization and coherence were positively affected, allowing students to construct sophisticated, well-structured sentences that differ from conventional writing styles they were previously accustomed to.

## **Implications of the Study**

The findings of this study offer valuable insights for the integration of ChatGPT into EFL writing instruction, with implications for both theoretical frameworks and practical application. Practically, ChatGPT-supported writing exercises have the potential to reshape how learners enhance their revision and composition skills. By providing immediate, tailored feedback, ChatGPT enables students to identify errors and areas requiring improvement in real time, thereby facilitating the revision process. This instantaneous feedback promotes learner autonomy, empowering students to exercise greater control over their writing activities and leading to improved overall writing quality as well as enhanced independent revision capabilities. Such outcomes align with self-regulated learning principles, as students are encouraged to monitor, evaluate, and manage their own writing processes. From a theoretical perspective, this research underscores the relevance of constructivist learning theories in EFL writing contexts. ChatGPT functions as a feedback conduit, allowing learners to engage in iterative, interactive

processes that foster the development of writing skills through structured revision. Additionally, the study highlights the necessity of revisiting sociocultural theory in light of AI-mediated tools. While ChatGPT provides scaffolding that supports learners, the social and cultural dimensions of learning remain critical; AI-driven feedback should complement the rich, context-sensitive guidance that instructors provide within classroom environments.

### Future Research Recommendations and Suggestions

Based on the study's findings, it is recommended that ChatGPT-supported writing activities be systematically integrated into EFL curricula to enhance learners' revision strategies and overall writing performance. Educators should provide explicit guidance on the effective use of AI feedback, ensuring that students benefit from the tool while avoiding overreliance on technology. Further research is warranted to investigate the long-term effects of ChatGPT on EFL writing development, particularly regarding learners' application of AI-assisted strategies in open-ended writing tasks. Moreover, comparative studies exploring ChatGPT's efficacy across diverse cultural and linguistic contexts, especially within EFL settings, could offer valuable insights into the tool's adaptability and its broader potential for supporting language learning globally.

### Conclusion

EFL learners can enhance their writing proficiency by engaging in ChatGPT-assisted revision activities. Through this process, they expand their vocabulary, improve grammatical accuracy, and organise paragraphs more effectively. Their writing speed and overall output quality increase, as confirmed by the test results. The EG consistently outperformed the CG, highlighting ChatGPT's role as a valuable support tool in EFL writing classrooms. The AI encourages students to focus on higher-order thinking skills and promotes reflection on their written work. Over time, learners move beyond surface-level corrections to address more complex aspects, including writing fluency and overall quality. Grammar and vocabulary appear to benefit the most, demonstrating that ChatGPT contributes significantly to these dimensions of writing. Rather than merely reinforcing basic grammar rules, it introduces new lexical items and expressions, enriching students' linguistic repertoire. In paragraph construction, the

AI's guidance assists learners in logically structuring their ideas. Nevertheless, teacher involvement remains indispensable in EFL contexts, as participants in this study emphasised. Additionally, ethical and privacy considerations must be addressed before AI tools such as ChatGPT are broadly implemented in language learning initiatives.

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