USING QUILLBOT TO ENHANCE PARAPHRASING SKILLS AMONG ALGERIAN EFL UNIVERSITY STUDENTS[1]

Abstract: *This study investigates the effectiveness of QuillBot, an AI-powered paraphrasing tool, in enhancing Algerian EFL university students' paraphrasing skills within linguistics coursework. Paraphrasing remains a complex academic skill for many EFL learners, especially when dealing with content-heavy, discipline-specific texts. While AI tools like QuillBot are gaining popularity, few studies have evaluated their impact through controlled interventions in subject-specific academic contexts, particularly in underrepresented regions such as North Africa. Ninety third-year English majors at Batna 2 University participated in a four-week quasi-experimental study. Students were divided into an experimental group (N = 45), which received guided instruction on using QuillBot during linguistics writing tasks, and a control group (N = 45), which followed traditional instruction. Pre- and post-tests measured students' paraphrasing performance, while qualitative data were gathered through open-ended questionnaires and focus group discussions designed to explore learners' experiences and attitudes.Quantitative findings revealed statistically significant improvements in the experimental group's paraphrasing performance, with large effect sizes. Qualitative results showed that students valued QuillBot for expanding vocabulary, improving sentence structure, and increasing confidence in expressing complex academic content. However, concerns emerged about overreliance on the tool, limited critical reflection, and potential ethical issues when using AI-generated language. The study highlights the pedagogical potential of integrating AI tools like QuillBot into subject-specific writing instruction, particularly when combined with explicit strategies that promote critical engagement, ethical awareness, and learner autonomy. By focusing on a content-driven course in an under-researched Algerian context, this research contributes empirical evidence to the evolving discussion on AI in education and offers practical implications for instructors seeking to enhance writing instruction through responsible AI integration.*

Keywords: *QuillBot, paraphrasing AI tools, subject-specific writing, Algerian EFL students.*

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UTILISATION DE QUILLBOT POUR AMÉLIORER LES COMPÉTENCES EN PARAPHRASE CHEZ LES ÉTUDIANTS ALGÉRIENS EN ANGLAIS LANGUE ÉTRANGÈRE À L'UNIVERSITÉ

Résumé : Cette étude examine l'efficacité de QuillBot, un outil de paraphrase alimenté par l'IA, dans l'amélioration des compétences en paraphrase des étudiants algériens en anglais langue étrangère (EFL) dans le cadre de cours de linguistique. La paraphrase reste une compétence académique complexe pour de nombreux apprenants de l'anglais langue étrangère, en particulier lorsqu'il s'agit de textes riches en contenu et spécifiques à une discipline. Alors que les outils d'IA tels que QuillBot gagnent en popularité, peu d'études ont évalué leur impact à travers des interventions contrôlées dans des contextes académiques spécifiques à une matière, en particulier dans des régions sous-représentées telles que l'Afrique du Nord. Quatre-vingt-dix étudiants de troisième année en anglais à l'université de Batna 2 ont participé à une étude quasi expérimentale de quatre semaines. Les étudiants ont été répartis en un groupe expérimental (N = 45), qui a reçu des instructions guidées sur l'utilisation de QuillBot lors de tâches de rédaction linguistique, et un groupe témoin (N = 45), qui a suivi un enseignement traditionnel. Des tests pré et post-intervention ont mesuré les performances des étudiants en matière de paraphrase, tandis que des données qualitatives ont été recueillies au moyen de questionnaires ouverts et de discussions de groupe conçues pour explorer les expériences et les attitudes des apprenants. Les résultats quantitatifs ont révélé des améliorations statistiquement significatives des performances de paraphrase du groupe expérimental, avec des effets de grande ampleur. Les résultats qualitatifs ont montré que les étudiants appréciaient QuillBot pour l'enrichissement de leur vocabulaire, l'amélioration de la structure de leurs phrases et le renforcement de leur confiance dans l'expression de contenus académiques complexes. Cependant, des inquiétudes ont été soulevées concernant la dépendance excessive à cet outil, le manque de réflexion critique et les problèmes éthiques potentiels liés à l'utilisation d'un langage généré par l'IA. L'étude met en évidence le potentiel pédagogique de l'intégration d'outils d'IA tels que QuillBot dans l'enseignement de l'écriture dans des matières spécifiques, en particulier lorsqu'ils sont associés à des stratégies explicites qui favorisent l'engagement critique, la conscience éthique et l'autonomie des apprenants. En se concentrant sur un cours axé sur le contenu dans un contexte algérien peu étudié, cette recherche apporte des preuves empiriques au débat en cours sur l'IA dans l'éducation et offre des implications pratiques pour les enseignants qui cherchent à améliorer l'enseignement de l'écriture grâce à une intégration responsable de l'IA.

Mots-clés : QuillBot, outils d'IA de paraphrase, écriture disciplinaire, étudiants algériens en anglais langue étrangère.

1. Introduction

Writing remains one of the most demanding skills for students learning English as a foreign language, particularly at the university level. It requires more than accuracy in grammar and vocabulary; students must learn to organize complex information, express ideas clearly, and engage critically with academic sources. These challenges intensify in disciplines like linguistics, where students are expected not only to grasp abstract theoretical concepts but also to analyze and apply them in written assignments (Rahmayani, 2018; Tran & Nguyen, 2022). In this context, paraphrasing emerges as a particularly crucial skill. It allows learners to reframe scholarly material in their own words, helping them integrate knowledge meaningfully and avoid plagiarism—yet it is often one of the most difficult skills to master.

Effective paraphrasing calls for more than linguistic substitution; it demands comprehension, reformulation, and a confident command of language. In linguistics courses, where students routinely summarize sources, rephrase complex definitions, and build arguments based on cited work, paraphrasing becomes essential. However, many EFL learners lack the vocabulary depth and syntactic control needed to do this well. As a result, they may fall into the habit of copying phrases too closely, risking unintentional plagiarism and weakening their writing quality (McInnis, 2009; Ramadhani, 2019). In Algerian universities, writing instruction is often teacher-centered, and explicit training in paraphrasing is rare—especially within subject-specific contexts like linguistics, where the intersection of language and disciplinary content adds another layer of difficulty (Badriyah et al., 2021).

Recently, artificial intelligence (AI) tools have been introduced into academic writing instruction, offering new possibilities. Paraphrasing tools such as QuillBot are designed to help users rephrase sentences, vary their vocabulary, and improve grammatical accuracy while maintaining the original meaning (Kurniati & Fithriani, 2022; Nurmayanti & Suryadi, 2023). These tools may offer valuable scaffolding for students who struggle with language control, providing examples of syntactic variation and helping them avoid surface-level repetition. However, without proper guidance, students may misuse such tools, relying on them passively rather than using them as part of a thoughtful writing process (Rogerson & McCarthy, 2017).

While the popularity of AI-based tools has grown, most existing research focuses on students' attitudes and perceived benefits rather than their actual writing performance. For instance, Alammar and Amin (2023) found generally positive perceptions of QuillBot among EFL learners, but their study relied on self-reported data. Others, such as Truong Hong Ha (2023) and Amyatun and Kholis (2023), have investigated the tool's role in essay writing, though these studies often lack robust designs or do not address specific disciplinary writing tasks.

This study seeks to fill that gap by focusing on the use of QuillBot in the context of linguistics assignments among Algerian EFL students. Linguistics is a particularly challenging subject for learners, as it requires mastering both content-specific terminology and abstract reasoning. Writing assignments in this field often demand paraphrasing scholarly work—something students must do to show both understanding and originality. By integrating QuillBot into linguistics coursework and evaluating its effectiveness through a quasi-experimental design, this research offers both empirical insights and pedagogical reflections on the tool's role in improving paraphrasing.

The novelty of this study lies in its focus on a content-heavy subject, its application of AI tools in an underexplored North African context, and its dual emphasis on learning outcomes and learner experience. It not only asks whether QuillBot works but also explores how it can be used ethically and effectively to support academic writing in a linguistics classroom where students are often left without sufficient instructional scaffolding.
The present study attempts to answer the following questions:

1. Does integrating QuillBot into linguistics coursework significantly enhance the paraphrasing performance of Algerian EFL students compared to traditional instruction?
2. How do students perceive the role and usefulness of QuillBot in supporting academic writing tasks in linguistics?

3. What challenges and ethical concerns arise from the use of QuillBot in paraphrasing instruction among EFL learners?

This study contributes to both applied linguistics and the growing field of educational AI by evaluating how a tool like QuillBot affects writing development in a subject-specific context. Rather than general essay writing, it focuses on linguistics assignments, where paraphrasing is often required but rarely taught. Using a quasi-experimental design and collecting qualitative reflections, the research bridges a methodological gap and adds localized knowledge from an underrepresented region. It also offers practical guidance for integrating AI tools into writing instruction in a way that supports learning, respects academic integrity, and meets the real needs of students navigating both linguistic and disciplinary complexity.

2. Literature Review

Paraphrasing is widely acknowledged as one of the more demanding aspects of academic writing, especially for learners of English as a foreign language. It requires students not only to understand the source text but also to express the same ideas in new language while maintaining accuracy and coherence. This cognitive process places a dual burden on learners: conceptual understanding and linguistic reformulation. For many EFL learners, this process is complicated by limited vocabulary, difficulties with grammar, and a lack of experience in dealing with academic texts. Several studies have noted that poor paraphrasing skills often result in unintentional plagiarism and weaken the overall quality of student writing (Ramadhani, 2019; Rahmayani, 2018). In Algerian higher education, where explicit writing instruction remains minimal and often decontextualized, these challenges are even more acute.

Writing a research paper involves not just content generation but also the ability to engage critically with existing literature. This includes summarizing and paraphrasing sources in ways that reflect understanding and avoid excessive dependence on the original language. Tran and Nguyen (2022) emphasize that paraphrasing is more than a technical skill—it reflects students' capacity for analysis and synthesis. Yet, despite its centrality in academic writing, paraphrasing is often underrepresented in formal instruction. McInnis (2009) points out that students who struggle with paraphrasing are also more likely to face difficulties in completing research assignments, particularly those that require academic integrity and original thought. These difficulties are not simply linguistic but pedagogical, stemming from a lack of sustained training in textual transformation and source integration.

In recent years, the emergence of AI-powered writing tools has added a new dimension to the way students approach academic writing. Tools like QuillBot, Grammarly, and Ginger have become increasingly popular for their ability to rephrase, correct grammar, and improve fluency. QuillBot, in particular, has drawn attention because of its paraphrasing function, which offers learners a variety of sentence structures and vocabulary alternatives (Kurniati & Fithriani, 2022). This has made it appealing to students who lack confidence in their linguistic abilities or who need support in refining their writing. However, the pedagogical implications of such tools remain underexplored, especially in formal educational contexts where writing is tied to assessment and originality.

Some researchers see these tools as having genuine educational value. For instance, a study by Truong Hong Ha (2023) found that Vietnamese EFL students benefited from using QuillBot, especially when preparing for IELTS writing tasks. The tool helped students to become more aware of lexical and syntactic options, and many reported that it made them

feel more confident about their writing. Similarly, Nurmayanti and Suryadi (2023) reported that Indonesian students using QuillBot demonstrated noticeable improvement in sentence complexity and organization. Yet these studies tend to focus on learner perceptions or test-preparation contexts, and they often lack empirical rigor or application to academic coursework.

However, not all research presents an entirely positive view. Several scholars have raised concerns about overreliance on such tools. Alammar and Amin (2023), for example, observed that many students in their study used automated paraphrasing tools uncritically. They accepted the suggestions without reflecting on meaning or structure, which limited their learning and led to superficial improvements. There is also the risk, as Rogerson and McCarthy (2017) caution, that students may blur the line between using a tool for support and using it to complete a task on their behalf, which raises ethical issues around authorship and plagiarism. Such concerns are particularly relevant in academic environments where expectations of originality and transparency are high but not always clearly communicated to students.

One recurring limitation in the current literature is the lack of robust research designs. Many existing studies rely on student self-reports or short-term observations, and few include control groups or objective performance measures. As a result, while students often say they benefit from AI tools, we know less about whether these tools lead to lasting improvements in writing ability. Moreover, most of the available research has been conducted in Asian or Gulf contexts, with little attention paid to educational settings in North Africa. This limits the generalizability of findings to Algerian universities, where students may face different linguistic, technological, and pedagogical challenges. Furthermore, there is a notable absence of studies that examine the integration of AI tools in subject-specific writing tasks, where disciplinary knowledge and specialized vocabulary introduce additional complexity.

In addition to questions about effectiveness, researchers have also explored how students perceive AI tools. Studies show that learners tend to view tools like QuillBot positively, appreciating the convenience and support they offer. But perceptions can be shaped more by the ease of use than by any real impact on learning. For example, while students in the study by Truong Hong Ha (2023) liked using QuillBot, few of them reported thinking critically about the tool's suggestions. In another study, Amyatun and Kholis (2023) found that some students relied on QuillBot not just for paraphrasing but as a way to complete tasks more quickly, without necessarily engaging in deeper revision or learning. These patterns suggest that the pedagogical potential of AI tools is contingent on how they are introduced, framed, and scaffolded by instructors.

These findings point to the need for a more guided and reflective use of AI tools. If students are introduced to QuillBot within a structured instructional context—one that emphasizes critical thinking, revision, and academic ethics—then the tool can serve as a learning aid rather than a shortcut. Alammar and Amin (2023) highlight this approach in their study, where students received explicit training in the writing process and were encouraged to use paraphrasing tools only after drafting and revising manually. This kind of integrated approach appears to hold more promise than simply allowing unrestricted use of AI tools. It also shifts the focus from technological efficiency to pedagogical intentionality—recognizing that the tool's value depends on how learners are taught to engage with it.

In conclusion, although interest in AI tools for enhancing EFL writing—particularly paraphrasing—is growing, much of the current literature remains methodologically limited,

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often relying on perception-based data or general writing contexts. There is a noticeable gap in research that combines rigorous experimental design with a focus on subject-specific academic writing, particularly in underrepresented educational settings such as Algeria. Moreover, few studies explore how AI tools perform when integrated into content-heavy coursework, where students must paraphrase complex and discipline-specific material. This study addresses that gap by employing a quasi-experimental design to evaluate the impact of QuillBot on EFL students' paraphrasing performance in linguistics coursework. It also explores students' experiences and challenges in engaging with the tool. The following section outlines the methodological framework adopted to systematically assess both the learning outcomes and the pedagogical implications of integrating QuillBot into a content-heavy academic environment.

3. Methodology

3.1. Research design and rationale

This study was designed to investigate whether using QuillBot as an instructional support tool could help university EFL students improve their paraphrasing skills. To achieve this, a quasi-experimental design was adopted, involving one experimental group and one control group. This approach was chosen because random assignment of participants was not possible within the institutional context, where students are already placed into intact classes. However, by comparing two comparable groups—one receiving QuillBot-assisted instruction and the other receiving traditional instruction—it was still possible to draw meaningful conclusions about the tool's impact.

The quasi-experimental approach also allowed the researcher to maintain the authenticity of classroom instruction while observing how the integration of a digital tool like QuillBot could influence learning outcomes. Since paraphrasing is a skill that depends on practice and feedback, the design made it possible to embed the tool into actual writing tasks and monitor its effects over time. Including both quantitative and qualitative tools helped balance objective performance results with students' personal experiences and perceptions.

3.2. Participants

The study involved 90 third-year undergraduate students (aged 20–27) from the Department of English Language and Literature at Batna 2 University, Algeria. They were divided into two intact classes: an experimental group (n = 45) and a control group (n = 45). Group assignment was based on existing class divisions to maintain the regular academic schedule. At this stage in their program, students are expected to engage in research-based writing and are introduced to academic skills such as paraphrasing, summarizing, and integrating sources—making them well-suited for the study's objectives.

All participants had similar language backgrounds and writing experience and were considered upper-intermediate EFL users (approximately B2 level on the CEFR scale), based on institutional placement tests and coursework history. None had received formal instruction in paraphrasing prior to the study, though 18% of the participants reported limited informal exposure to QuillBot or similar tools. To ensure baseline equivalence, both groups completed a paraphrasing pre-test before the intervention, which revealed no statistically significant differences in initial performance.

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3.3. Instructional procedure

The intervention took place over four weeks, from April 2 to April 30, 2025, during regular linguistics classes. Each session lasted about 90 minutes and was conducted by the course instructor, who also served as the researcher. To maintain the authenticity of the classroom environment and avoid disrupting the existing schedule, the intervention was embedded into the regular course activities.

At the start and end of the intervention, both the experimental and control groups completed the same paraphrasing pre- and post-tests. The experimental group received focused instruction on how to use QuillBot to support their paraphrasing. Students were introduced to the tool in class and guided in using it specifically for rewording texts related to linguistics, including academic readings and research-based content. During class sessions, they practiced paraphrasing both with and without the tool, compared different versions of their work, and discussed the lexical and structural changes suggested by QuillBot. Weekly assignments were submitted for feedback from the instructor.

The control group received conventional instruction in paraphrasing. They worked with the same materials and completed similar tasks but without the use of QuillBot or any AI-based writing tools. Their instruction relied on teacher explanation, modeling, hands-on rewriting tasks, and instructor feedback.

By integrating QuillBot into actual coursework, the intervention provided the experimental group with a realistic and relevant use of the tool. This allowed the study to assess the impact of AI-assisted paraphrasing within a meaningful and discipline-specific learning context.

3.4. Data collection tools

To evaluate the impact of the intervention, multiple forms of data were collected:

3.4.1. Pre-test and post-test

The paraphrasing rubric used for both tests consisted of four key dimensions: (1) Accuracy of meaning transfer, (2) Lexical diversity and appropriateness, (3) Grammatical range and correctness, and (4) Degree of syntactic transformation. Each response was rated on a five-point scale per criterion (maximum total = 20). To illustrate, a high-quality paraphrase would rephrase a dense academic definition by changing both structure and vocabulary while preserving meaning, whereas a low-quality one would merely substitute a few words or distort the original intent.

All students completed a paraphrasing test before and after the instructional period. The test required them to paraphrase academic passages, and their responses were assessed using a rubric that focused on clarity, accuracy, grammatical correctness, and lexical variation. The same criteria were used for both tests to ensure consistency.

3.4.2. Students' questionnaire

After the intervention, a questionnaire was given to the experimental group to explore their experiences with QuillBot. It included both scaled items and open-ended questions covering

ease of use, perceived benefits, challenges, and concerns about using the tool in academic writing.

3.4.3. Focus group interviews

A smaller group of students from the experimental class participated in follow-up interviews. Specifically, two 45-minute focus group discussions were held with a total of 10 students. These discussions allowed the researcher to explore students' reflections in more depth— particularly their thoughts on using QuillBot as part of their writing process.

3.5. Data analysis
The test results were analyzed using both within-group and between-group comparisons. A paired-sample t-test was used to see if there was a significant improvement in each group's performance from pre-test to post-test. An independent samples t-test compared the two groups to determine whether the gains made by the experimental group were statistically different from those of the control group.

Responses from the questionnaire were summarized using descriptive statistics to highlight common patterns in student attitudes toward the tool. The interview transcripts and open-ended responses were analyzed thematically using Braun and Clarke's (2006) six-phase framework.

3.6. Ethical considerations

All participants were fully informed about the purpose and procedures of the study, and their participation was entirely voluntary. They were assured that they could withdraw at any time without consequence, and that their involvement would have no impact on their academic evaluation or course grades. To maintain confidentiality and protect student identities, no personally identifiable data were collected. All names used in the reporting of qualitative findings are pseudonyms. Both the experimental and control groups received equal instructional time, and students in the control group were later granted access to QuillBot to ensure fairness and equity in learning opportunities.

4. Results

This section outlines the main findings of the study, based on both the quantitative test scores and qualitative data gathered from the experimental group. The results are presented in four parts. First, the pre-test scores are examined to ensure the two groups were comparable before the intervention. Second, changes within each group between pre- and post-tests are analyzed. Third, the post-test performances of the experimental and control groups are compared. Finally, students' perceptions and reflections on their experience with QuillBot are discussed, based on questionnaire responses and focus group feedback.

4.1. Pre-Intervention group equivalence

To ensure the experimental and control groups were comparable before the intervention, an independent samples t-test was conducted on their pre-test scores. The results, presented in Table 1, show no statistically significant difference between the groups, confirming a similar starting point.

Group	Mean (M)	SD	*t*	*p*
Experimental	9.82	1.31	0.60	0.55
Control	9.63	1.26		

Table 1. Independent Samples T-Test for Pre-Test Scores

4.2. Within-group comparisons

Paired-sample t-tests were used to measure progress within each group from pre-test to post-test. Results are shown in Table 2.

Group	Pre-Test M (SD)	Post-Test M (SD)	*t*	*p*	Effect Size (*d*)
Experimental	9.82 (1.31)	13.06 (1.44)	11.48	< .001	1.94
Control	9.63 (1.26)	10.71 (1.38)	4.31	< .001	0.73

Table 2. Within-Group Gains in Paraphrasing Scores

The experimental group showed a larger and statistically stronger improvement than the control group. The high effect size ($d = 1.94$) indicates a robust impact of QuillBot-assisted instruction.

4.3. Between-group comparison of post-test scores

An independent samples t-test comparing the post-test means of both groups revealed a statistically significant difference favoring the experimental group.

Group	Post-Test Mean (SD)	*t*	*p*	Effect Size (*d*)
Experimental	13.06 (1.44)	7.08	< .001	1.69
Control	10.71 (1.38)			

Table 3. Comparison of Posttest Scores Between Experimental and Control Groups

These results confirm that students who received QuillBot-based instruction significantly outperformed their peers in the control group in terms of paraphrasing accuracy and sophistication.

4.4. Students' perceptions of QuillBot (Experimental group only)

A post-intervention questionnaire was administered to the experimental group to gather feedback on their experiences with QuillBot.

Statement	Strongly Agree
QuillBot helped me notice better sentence structures	82.8%
It improved my vocabulary for paraphrasing	77.1%
I feel more confident paraphrasing after using QuillBot	68.5%
I worry that I may rely too much on QuillBot	54.2%
I now revise AI-generated content instead of copying it blindly	71.4%

Table 4. Selected Items from the Student Questionnaire

The results from the Likert-scale items revealed generally positive student experiences with QuillBot. A large majority (82.8%) strongly agreed that it helped them notice better sentence structures, while 77.1% felt it improved their vocabulary for paraphrasing. Additionally, 68.5% reported greater confidence in paraphrasing after using the tool. At the same time, 54.2% expressed concern about relying too heavily on it, highlighting the need for pedagogical guidance. Encouragingly, 71.4% said they now revise AI-generated content instead of copying it directly. These findings suggest that while QuillBot can support writing development, its use should be accompanied by instruction that fosters critical engagement.

4.5. Results of thematic analysis
The analysis of students' responses, drawn from both open-ended questionnaire items and focus group discussions, revealed three recurring themes: increased language awareness and learning support, improvement in writing habits and confidence, and concerns related to overreliance and ethical use. These themes were echoed by the majority of participants, with specific insights voiced by approximately 25 out of the 35 students in the experimental group.

The first theme, language awareness and learning support, was noted by more than half of the participants. Many students explained that QuillBot exposed them to new ways of expressing ideas, particularly through variations in vocabulary and sentence structure. These changes, they said, gradually improved their awareness of how language could be shaped and refined. One student from Focus Group 1 (Sami) noted, *"I never thought of using 'moreover' or 'in light of' before. Seeing how QuillBot rephrased my sentences gave me new expressions I now try to use on my own."* Similarly, Imane, who responded to the questionnaire, reflected, *"It made me realize how boring my vocabulary was. QuillBot helped me vary the way I say things, but I also try to understand why it chooses those words"* Such remarks suggest that, beyond simply correcting or rewording sentences, QuillBot served a model-building function—giving students alternative phrasing that they began to internalize and consciously adopt.

The second theme concerned improvement in writing habits and increased confidence. Around 18 participants shared that they became more attentive to the writing and revision process and more thoughtful in evaluating their work. Students expressed that they no longer viewed paraphrasing as a mechanical task but rather as a skill to develop through comparison and reflection. Adel, a student from Focus Group 2, remarked, *"Before I used to just write and submit. Now I always compare my version with QuillBot's and ask myself which one sounds clearer and why."* Lina, in her questionnaire response, noted, *"I used to feel stuck with paraphrasing, but now I feel more confident. I use it as a guide, not as a copy-paste tool."* These insights suggest a growing sense of control over the writing process, with

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students beginning to view paraphrasing as something they could approach with greater independence and intentionality.

The third theme, expressed by roughly 10 students, focused on overreliance and ethical concerns. While appreciative of the support QuillBot provided, some students admitted to using the tool passively—accepting its suggestions without evaluating them—or relying on it when they felt fatigued or pressured. Khaled, in Focus Group 1, acknowledged this tendency: *"Sometimes I just accept the version QuillBot gives without really checking if it makes sense. Especially when I'm tired or in a hurry."* Sara, responding to the questionnaire, voiced a deeper concern: *"It's helpful, but I'm scared I'm not really learning. If I stop using it, can I still paraphrase on my own?"* These reflections highlight the fine balance between using AI as a form of guidance and falling into habits that may hinder students' long-term development as independent academic writers.

Taken together, the student feedback underscores both the benefits and the risks of integrating AI tools like QuillBot into writing instruction. When supported with explicit guidance and opportunities for reflection, such tools can foster meaningful gains in language use and learner autonomy. However, without such support, students may become dependent on the tool and miss opportunities to engage critically with their own language development.

A comparison of the test scores and student feedback reveals strong alignment between the statistical gains and learners' reflections. The significant improvement in post-test scores among the experimental group (M = 13.06 vs. 10.71, p < .001, d = 1.69) is supported by students' own reports of learning. Most students noted that QuillBot helped them better understand sentence structure and vocabulary—82.8% and 77.1%, respectively—while qualitative comments highlighted how the tool exposed them to new ways of phrasing and encouraged critical revision.

At the same time, qualitative insights offered nuance. While the test results point to successful skill development, some students raised concerns about overreliance, with 54.2% admitting they sometimes used the tool passively. These ethical concerns did not appear in the test data but emerged clearly in focus group discussions, where students reflected on the limits of AI support.

Overall, the cross-analysis confirms that QuillBot, when used with guidance, enhanced paraphrasing performance and encouraged reflection. Yet it also underscores the need for instructional strategies that help students use such tools critically and ethically.

5. Discussion

This study explored the effectiveness of QuillBot, an AI-powered paraphrasing tool, in enhancing Algerian EFL university students' paraphrasing abilities within linguistics coursework. The results offer empirical and pedagogical insights into how AI-based writing support, when appropriately integrated into classroom instruction, can shape learner development in under-researched EFL contexts such as Algeria.

An important pedagogical implication concerns sustainability: whether improvements in paraphrasing persist once QuillBot is no longer used. While this study did not track long-term outcomes, students' increased metalinguistic awareness and reflective habits suggest that guided AI use can lead to transferable skills. Future classroom follow-ups could measure retention of these gains after tool removal to verify durable learning effects.

The significant improvement in the experimental group's paraphrasing scores suggests that the integration of QuillBot into classroom instruction can meaningfully enhance

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learners' academic writing performance. Unlike many earlier studies that relied on perception-based data (e.g., Alammar & Amin, 2023; Amyatun & Kholis, 2023), this study used a quasi-experimental design with pre- and post-tests, thus providing robust evidence of measurable learning gains.

The findings align with prior research indicating that AI tools can assist EFL learners in refining grammar, vocabulary, and sentence structure (Kurniati & Fithriani, 2022; Truong Hong Ha, 2023). However, this study moves beyond surface-level evaluation by embedding QuillBot within a structured pedagogical framework that emphasized guided practice, critical reflection, and comparative analysis. In doing so, it demonstrates that AI can function not merely as a convenience tool, but as a cognitive scaffold—a concept rooted in Vygotsky's (1978) Zone of Proximal Development (ZPD). When students engage with AI under instructional guidance, the tool extends their capability to perform tasks that would otherwise be beyond their current competence, allowing them to internalize higher levels of linguistic complexity over time.

Moreover, the large effect size (Cohen's d = 1.69) suggests that AI-supported paraphrasing can be a powerful aid in EFL academic writing when combined with intentional teaching strategies. The improvement is not merely procedural; it reflects a deeper cognitive shift toward more flexible language use—supporting insights from cognitive load theory (Sweller, 1994), which suggests that instructional tools can offload extraneous cognitive demands and enable learners to focus on core meaning construction.

At the same time, the results challenge the pessimistic views expressed by scholars like Rogerson and McCarthy (2017), who caution that AI tools may promote mechanical or passive engagement. In contrast, the students in this study used QuillBot to enhance—not replace—their understanding of paraphrasing techniques, indicating a more active and reflective orientation when supported by classroom instruction.

The qualitative data reveal that students perceived QuillBot as both supportive and transformative. A majority viewed the tool as a linguistic mirror that exposed them to alternative phrasing, lexical variation, and syntactic sophistication. In many cases, learners described QuillBot not as a replacement for their writing but as a model-building resource—a source of inspiration for more nuanced expression.

This mirrors Woodward-Kron's (2007) concept of "scaffolded academic discourse," wherein learners progress from imitative to independent use of complex academic forms. In particular, students' reflections on comparing their own sentences with AI-generated alternatives suggest a meta-awareness of language that is crucial to academic literacy development. These findings complement those of Amyatun and Kholis (2023), but they also extend them by showing that advanced learners, when guided, engage with AI suggestions more critically.

Nevertheless, students were not uncritical in their acceptance of the tool. Some expressed concerns about overreliance, echoing the ethical anxieties raised in previous studies (Rogerson & McCarthy, 2017; Koltovskaia, 2020). A few participants noted that they occasionally accepted suggestions without fully understanding them, especially when fatigued or under pressure. This ambivalence reflects an important pedagogical reality: students are still negotiating the boundaries between AI-assisted support and genuine authorship. It also underscores the need for explicit instruction in critical digital literacy—teaching students not only *how* to use AI tools, but also *when* and *why* to use them.

The findings highlight a critical tension between technological convenience and deep learning. While most participants acknowledged QuillBot's usefulness, several

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expressed uncertainty about whether its use truly fostered long-term skill development. Some reported that the tool occasionally produced sentences that were grammatically correct but stylistically awkward or semantically imprecise — issues also identified by Koltovskaia (2020). However, such imperfections served a pedagogical function by prompting revision and critical evaluation. In this way, the tool did not inhibit learning but rather catalyzed cognitive conflict, encouraging students to refine their judgments and take ownership of the writing process.

This suggests that the effectiveness of AI in language learning is not inherent in the tool itself but emerges from the instructional ecology surrounding its use. When AI tools are framed as collaborative partners in the learning process—and when students are trained to interrogate their outputs—they can contribute to the development of both strategic competence and academic integrity.

Furthermore, the Algerian EFL context adds an important dimension to this discussion. With limited access to advanced writing instruction and growing exposure to digital technologies, students often rely on informal practices that may or may not align with academic standards. In this environment, QuillBot served as a **supplement to instruction**, bridging the gap between students' current abilities and institutional expectations. Yet, without clear pedagogical frameworks, such tools could equally risk reinforcing passive, surface-level engagement with academic content.

Taken together, the findings support a growing consensus in applied linguistics: that technology alone does not transform learning—pedagogy does (Hyland, 2016; Popenici & Kerr, 2017). Simply introducing AI tools into the classroom is insufficient. What matters is how these tools are embedded within **reflective,** ethically-informed, and skill-oriented instruction.

Teachers should explicitly teach students to use AI tools like QuillBot not as answer generators, but as thinking partners. This can be achieved through scaffolded activities such as:

- Comparing and critiquing AI-generated paraphrases,
- Collaborative rewriting and justifying edits,
- Reflective journaling on tool use,
- And class discussions on authorship and ethical boundaries.

Moreover, institutions should take proactive steps to **develop policies** that clarify the acceptable use of AI tools in student work. These guidelines should balance innovation with integrity, helping students navigate the fine line between assisted learning and academic misconduct.

This study contributes to an emerging body of research at the intersection of AI and EFL writing pedagogy, especially within the underrepresented context of North Africa. It affirms the potential of tools like QuillBot to address gaps in explicit writing instruction, especially in content-heavy fields such as linguistics. More importantly, it offers localized evidence that supports a nuanced, instructionally embedded approach to AI use, one that empowers learners rather than makes them dependent.

In sum, QuillBot acted not as a shortcut to avoid thinking, but as a scaffold that—when used reflectively — helped students think better. The key challenge moving forward lies not in resisting AI but in reimagining our pedagogical practices to ensure that these tools enhance, rather than replace, human learning and authorship.

Conclusion

This study set out to examine the impact of integrating QuillBot, an AI-powered paraphrasing tool, into linguistics coursework for Algerian EFL university students. By situating the tool within actual subject-matter assignments, rather than general writing instruction, the research aimed to explore how AI support affects students' ability to paraphrase complex academic content. Using a quasi-experimental design, the study involved 90 third-year students from Batna 2 University, divided into control and experimental groups. The experimental group received guided training on using QuillBot to support paraphrasing during linguistics tasks, while the control group followed traditional instruction.

The findings revealed that the experimental group significantly outperformed the control group on paraphrasing tasks, demonstrating stronger ability to rephrase scholarly content with syntactic variety and semantic accuracy. Qualitative data from student reflections and focus group discussions further illustrated that learners found QuillBot especially helpful in tackling complex terminology, experimenting with alternative structures, and gaining confidence in their academic expression.

These outcomes highlight the value of using AI tools within a pedagogically structured framework — especially in subject-specific contexts like linguistics, where students often struggle to reformulate dense and abstract content. Rather than serving as shortcuts, tools like QuillBot can help scaffold learning when coupled with reflective instruction, allowing students to better internalize paraphrasing as a cognitive and linguistic process.

To make the most of AI tools like QuillBot in EFL writing instruction, especially in linguistics and other content-heavy courses, teachers should adopt an approach that prioritizes guided use over unsupervised application. Structured classroom activities—such as model analysis, collaborative rewriting, and AI-assisted peer review—can help students engage critically with tool outputs, encouraging them to question and revise rather than accept suggestions passively.

Teachers should also create space for ethical reflection, helping learners distinguish between acceptable support and academic dishonesty. Clarifying the boundary between assisted writing and plagiarism is essential, particularly as AI-generated paraphrasing becomes more accessible.

At the institutional level, professional development for faculty and writing center staff is strongly recommended. As AI tools become more commonplace, educators need training not only in their technical use but also in how to integrate them meaningfully into instruction. This is particularly important in under-resourced contexts like Algeria, where digital literacy and infrastructure vary widely.

Beyond classroom practice, institutional policies should articulate clear frameworks for ethical AI integration in EFL education. Such policies could include guidelines on permissible AI support, training workshops for teachers on AI pedagogy, and awareness campaigns to ensure students understand both benefits and boundaries of AI use in academic writing. This policy-level engagement would position AI not as a threat to academic integrity but as an ally in responsible language learning.

Although the study offers valuable insights, it has several limitations. First, the research was confined to a single department at one Algerian university, which may restrict the generalizability of the results. Second, the four-week intervention period, while long enough to show measurable improvement, does not allow for conclusions about the long-

term impact of QuillBot use on writing development. Additionally, although students' perceptions were explored qualitatively, richer longitudinal data—such as follow-up interviews or portfolio analysis—could have provided a deeper understanding of how their attitudes and strategies evolve over time.

The study also did not fully account for individual learner variables such as prior writing ability, digital literacy, or familiarity with linguistic terminology, all of which may have influenced the outcomes. Further research should explore the long-term effects of AI-assisted paraphrasing, particularly in relation to skill transfer across different genres and disciplines. Longitudinal studies could help determine whether improvements persist once the tool is no longer used regularly.

It would also be valuable to investigate how learners at varying proficiency levels respond to AI support and whether certain groups—such as students with lower writing confidence or limited digital experience—benefit more from targeted scaffolding. Comparative studies examining the effectiveness of different AI tools (e.g., QuillBot, Grammarly, or DeepL Write) could also help identify which features contribute most to improved learning outcomes.

Finally, incorporating teacher perspectives would enrich our understanding of classroom integration challenges. Broader investigations into institutional readiness, cultural perceptions of AI in education, and policy implications would also support more informed and equitable use of AI in Algerian—and wider North African—higher education contexts.

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