

Exploring AI-Mediated Writing Practices among Algerian EFL Students through Technology Acceptance Model and Self-Regulated Learning Perspectives

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Abstract

Generative artificial intelligence (AI) has rapidly evolved, creating different and new ways in which students deal with English as a Foreign Language (EFL) writing. Many concerns about learners' dependence on content generated by such tools are raised, even though their potential benefits have been investigated. The present study aims at exploring AI-mediated writing practices among EFL students in Algerian higher education through Technology Acceptance Model (TAM) and Self-Regulated Learning (SRL) perspectives. For this purpose, a descriptive exploratory design was adopted with 56 EFL students at Ecole Normale Supérieure Assia Djébar of Constantine, Algeria. A questionnaire consisting of closed-ended questions and one open-ended question was administered to collect data which were subsequently analysed using descriptive statistics and thematic analysis of students' responses. The findings reveal that the main reasons for students' use of AI tools are brainstorming, vocabulary development, grammar correction, and text organization improvement. AI is perceived to be useful at different stages of the writing process, especially planning and drafting. However, a more complex engagement with AI is revealed through the qualitative findings. Some students perceive it as a support to learning while others think that they have started to increasingly rely on it and consequently feel less confident in independent writing. As indicated by the findings, perceived usefulness significantly influences AI acceptance, and whether AI functions as cognitive scaffolding or a substitute for independent writing efforts is largely determined by how students are engaged with it. Finally, the study highlights the need for developing students' AI literacy and self-regulated learning strategies to promote responsible, critical, and ethical use of AI in EFL writing contexts.

Keywords: Artificial intelligence; AI-mediated writing; EFL writing; Technology Acceptance Model; Self-Regulated Learning; learner autonomy; academic integrity.

1. Introduction

The widespread availability of tools such as ChatGPT and other AI-assisted technologies has accelerated the integration of artificial intelligence (AI) into educational contexts. Such tools are being increasingly employed in the field of English as a Foreign Language (EFL) learning to assist in writing tasks. They provide services that range from grammar correction and translation to full-text generation. This advance has significantly altered the way EFL learners approach, practice and conceptualize writing.

There are important questions related to how students engage with AI tools despite the fact that several studies have started to investigate their many possible benefits in enhancing writing quality,

vocabulary use, and learner motivation. Indeed, the AI tools' increasing ability to generate extended pieces of writing, has raised many serious concerns related to learners' reduced cognitive engagement, overreliance, and loss of autonomy. Kasneci et al., 2023 claim that generative AI offers opportunities for personalized support and feedback but also raises concerns related to accuracy, dependence, and academic integrity (). However, if AI is appropriately employed by learners, it may serve as a powerful scaffold that sustains self-regulated learning.

In light of this contradictory situation, it is important to identify the existing research gap regarding the scarcity of empirical studies in certain contexts, including North African settings, despite the growing worldwide interest in AI-mediated learning. In addition, little attention is given to the dual relationship between usage patterns, perceptions, and emerging forms of dependence, when most of the existing literature is rather focused on either technology adoption or learning outcomes. The present paper, thus, attempts to address these gaps by exploring how Algerian higher education students use AI tools when they write in English as a foreign language, explore their perceptions of AI-assisted writing, and interpret emerging patterns of assistance and reliance through Technology Acceptance Model (TAM) and Self-Regulated Learning (SRL) perspectives. By taking into account insights from the TAM and SRL, the study aims to provide a context-sensitive understanding of AI-mediated writing practices and their potential implications for language learning.

1.1.Statement of the Problem

AI-assisted EFL writing has received considerable research attention, however, the related current literature remains divided in its interpretation of the way learners actually engage with AI tools and how such engagement affects the development of their writing performance. Most existing research focused mainly on writing performance outcomes such as task completion, fluency and accuracy, but paid little attention to the cognitive and metacognitive processes involved in AI-assisted writing, especially those related to learner autonomy and self-regulation.

Furthermore, current research tends to investigate learners' use of AI either through technology adoption perspectives, such as the Technology Acceptance Model (TAM), or through learning-oriented frameworks such as Self-Regulated Learning (SRL) disregarding the important integration of these two perspectives into a unified explanatory model. Consequently, there is little understanding of the relationship between students' adoption of AI tools, their actual writing practices, and the extent to which such practices promote or hinder autonomous learning and dependence on AI-generated content. This problem is intensified by lack of empirical studies in underexplored higher education EFL contexts such as North Africa and more specifically Algeria, where educational practices and institutional conditions are distinct from those in the more studied contexts. Despite the existence of some studies such as Boudouaia et al.'s (2024), on the use of AI tools in writing in the Algerian context, there is not sufficient evidence on the interaction between AI adoption on the one hand and self-regulated writing strategies, learner autonomy, dependence, and academic integrity within a single integrated framework on the other hand.

The major problem stated in this paper, therefore, is the lack of understanding of AI-assisted EFL writing, especially in relation to students' adoption of AI tools, their writing and learning processes and the possible ethical issues.

To address these research gaps, the present paper sets to examine AI-mediated practices among Algerian EFL higher education students. More specifically, it sets to investigate AI adoption patterns, explore self-regulated writing behaviours among students, and find out if the use of AI in writing

contributes to learner autonomy or dependence. Therefore, the present study is guided by the following research aims and questions:

1.2. Research Aims

1. Explore patterns of AI tool use in EFL writing among Algerian university students, including frequency, types of tools, and purposes of use.
2. Examine how AI tools are integrated into different stages of the writing process (planning, drafting, and revision) with implications for self-regulated learning.
3. Explore students' perceptions of the usefulness and contribution of AI tools to EFL writing."
4. Identify indicators of cognitive and behavioral AI reliance and potential overdependence on AI tools in EFL writing practices.
5. Explore students' attitudes toward the ethical use of AI in academic writing, particularly in relation to authorship and transparency.

1.3. Research Questions

1. What patterns characterize students' use of AI tools in EFL writing tasks (frequency, types, and purposes of use)?
2. How are AI tools integrated into different stages of the writing process?
3. How do students perceive the impact of AI tools on their writing quality and learning, in relation to perceived usefulness and ease of use?
4. To what extent do students' writing behaviors indicate different levels of reliance on AI tools?
5. What are students' attitudes toward the ethical use of AI in academic writing and academic integrity?

2. Literature Review

2.1. The Changing Nature of EFL Writing in the Age of AI

Generative artificial intelligence, especially tools such as ChatGPT, has rapidly evolved in the last few years, significantly altering the field of second or foreign language writing. A striking feature of this development is that generative AI tools are, today, able to create coherent texts, propose rhetorical structures and simulate disciplinary discourse, contrary to traditional technological tools like grammar checkers or machine translation systems. Pedagogically speaking, this shift has given way to vital questions related to the nature of writing itself. In this vein, Hyland (2003) claims that writing in a second language is not simply a linguistic activity. It is rather a social process that involves meaning-making, audience awareness, and authorial voice. Therefore, the cognitive and rhetorical engagement that has always been an inherent part of the writing activity may be endangered by the growing overreliance on AI generated texts. Both the potential and the risks of the integration of AI in the writing activity have recently been raised by many researchers. Song and Song (2023) for example, have found that learners' motivation and perceived writing competence could be enhanced by AI-assisted writing, mainly thanks to immediate feedback and idea generation. Similarly, Li et al. (2024) have claimed that many aspects of writing assessment and revision practices can be improved by the use of AI tools. However, along with these benefits there are risks of reduced originality, overreliance and superficial engagement with the writing process.

2.2. Understanding AI Adoption Through the Technology Acceptance Model (TAM)

Many studies have investigated the increasing adoption of AI tools in EFL writing by students. However, simply knowing that students use these tools is not enough; it is also important to account

for the reasons why students decide to use them. For this purpose, Davis (1989) proposed the Technology Acceptance Model (TAM), a useful theoretical framework which posits that students' use of technology is mainly driven by their perceived usefulness and perceived ease of use. In the context of AI writing, perceived usefulness often manifests itself when students believe that AI tools help them enhance their writing quality, reduce effort and improve performance. Venkatesh et al. (2003) later extended TAM by highlighting the role that contextual and social factors play in shaping the adoption of technology. Recently, many studies have confirmed the significance of TAM in AI-mediated learning environments. For instance, in a study involving 76 Algerian EFL undergraduate students, Boudouaia et al. (2024) obtained evidence that when students perceive ChatGPT as an effective tool for enhancing their writing skill, they are more likely to adopt it. In the same vein, Jmaiel et al. (2025) conducted a study where they concluded that students' performance in English for Specific Purposes (ESP) can significantly be improved by AI-supported writing environments, which confirms that continued use is reinforced by perceived usefulness.

However, the explanations offered by TAM about students' adoption of AI tools are limited because they are mainly concerned with explaining adoption *per se* rather than accounting for how learners interact with these technologies and whether these interactions are conducive to meaningful learning processes and skill development (Davis, 1989; Venkatesh & Davis, 2000). For example, TAM can explain that students use an AI tool such as ChatGPT to assist them in writing tasks because they perceive them as useful and easy to use. However, it does not account for the way in which they actually engage with the tool while they are dealing with the writing activity; that is, whether they critically evaluate AI-generated suggestions, simply copy and paste outputs without revision or refine prompts to improve text quality.

The TAM model accounts for the motivations justifying students' reasons for using AI tools, but it does not sufficiently account for the ways through which these tools are cognitively adopted when performing learning activities. For this reason, it is necessary to integrate an SRL perspective to whether AI use involves active regulation, critical evaluation, and reflective engagement or whether it leads to passive dependence.

2.3. AI Use as a Self-Regulated Learning Process

To overcome this limitation, a complementary framework is offered in the form of Self-Regulated Learning (SRL) theory. Zimmerman (2002) suggested that self-regulated learners are skilful at planning, monitoring and evaluating their learning strategies. In writing, such strategies include generating ideas, drafting, revising and reflecting on feedback. By using AI, self-regulated learners can benefit from real-time feedback, different possible phrasing, and structural suggestions. For example, students can use AI to help them easily revise their writing by identifying grammatical errors or suggesting better formulations. Zimmerman & Risemberg (1997) also explain that self-regulation is important in writing which requires learners to regulate planning, drafting, monitoring, and revision processes.

However, the extent to which AI can effectively promote SRL largely depends on the manner with which students engage with it. This is confirmed by research by Han et al. (2023) on how students engage in dialogues with AI. The results show that meaningful learning takes place when students iteratively interact with AI outputs through questioning, refining, and adapting them, rather than accepting generated responses as they are given. In the same way, Woo et al. (2023) gave considerable importance to "prompt engineering" as a skill that needs to be developed among students to enable

them to actively construct AI responses that meet their communicative goals. These studies suggest that self-regulation can either be enhanced or undermined by AI depending on whether students use it as a cognitive tool or a substitute for effort.

2.4. From Assistance to Dependence: Implications for Learner Autonomy

The distinction between AI-supported assistance and learner dependence constitutes a major tension in the literature on educational technology. There is a risk that exaggerated reliance on AI tools may reduce learners' ability to think independently and develop their writing skills even though it is widely acknowledged that the use of such tools can reduce cognitive load and help learners complete tasks by providing immediate and structural assistance.

With regard to Holec's (1981) definition of the concept of learner autonomy which implies that learners are responsible for managing their own learning—planning, monitoring, and evaluating their learning processes—, it can be argued that EFL writing involves the active generation of original ideas, organization of arguments, and critical revision of texts. However, such autonomy is jeopardized by the use of AI tools which offer ready-made content that turn learners into passive consumers instead of active producers.

Many studies have highlighted this conflict. For example, Boudouaia et al. (2024) found that writing performance significantly improved due to the use of AI-assisted writing tools. However, other studies showed that there were contradictions in students' experiences. Woo et al. (2023) for instance, claim that students recognized the benefits of AI tools but simultaneously expressed concerns about potential overdependence and reduced effort. These findings imply that AI use cannot be claimed to be inherently either beneficial or detrimental. Rather, its effect is largely dependent on whether it is used as a support of learning or a substitute for effort.

2.5. Academic Integrity in AI-Mediated Writing

Major ethical questions are raised by the use of AI tools in EFL writing, related to authorship, originality and academic integrity. There is a risk that content generated by AI, may misrepresent the student's personal contribution, without necessarily being judged as direct plagiarism. To illustrate, students can use AI tools in generating arguments, drafting paragraphs, paraphrasing ideas or restructuring their writing, producing texts that seem to be original, while they are partly non-human. Thus, long established traditions assuming that academic writing should be a faithful reflection of the writer's own thinking, language choices and writing processes are now challenged.

In this regard, the International Center for Academic Integrity (2021), posits that honesty, trust, and responsibility are the basic principles that constitute the very essence of academic integrity. These principles are, however, complicated by the use of AI tools which enable students to create high-quality impersonal texts with a minimum effort, giving way to some ethical concerns related to transparency and attribution.

As a reaction to these emerging challenges, international policy bodies have begun discussions that call for the necessity of establishing balanced and institutionally guided approaches to the use of AI in education. UNESCO's 2023 *Guidance for generative AI in education and research*, advocates that instead of completely prohibiting AI and establishing detection-based responses, educational institutions should develop ethical and pedagogical frameworks for the responsible use of AI. This consists of helping both students and teachers use AI responsibly, evaluate outputs critically and maintain authorship.

In this regard, the present study integrates the TAM and SRL by positing that technology acceptance influences patterns of AI use in writing, while self-regulated learning processes mediate the relationship between AI adoption and writing outcomes, including learner autonomy, dependence, and perceptions of academic integrity.

3. Research Methodology

3.1. Research design

A quantitative research approach supplemented by qualitative data was adopted in this study. To examine the Algerian EFL students' AI-mediated writing practices, perceptions of AI tools, and perceived levels of reliance on AI-assisted writing tools, a descriptive exploratory survey design is employed. To collect data, a questionnaire consisting of ten closed-ended questions and one open-ended question was used. The closed ended-questions were asked to obtain data related to students' AI use patterns, purposes of use, writing-stage integration, and attitudes toward AI-assisted writing. The open-ended question was asked to collect additional qualitative insights related to students' experiences and perceptions regarding the influence of AI tools on their English writing practices.

3.2. Research Context

The research context for this study is the Algerian higher education and more specifically the English Department of the Ecole Normale Supérieure Assia Djebbar, Constantine. At this institution, students receive an academic training that prepares them to be future teachers in different specialties including English as a foreign language, and academic writing is a major part of this academic and professional preparation. The choice of this context is motivated by the fact that there is relatively little empirical research on AI-assisted learning in the Algerian higher education, even though students are increasingly resorting to AI writing tools which may affect the way they approach English writing tasks. This context seems appropriate to explore students' AI-mediated writing practices, their perceptions of AI tools, their levels of reliance on AI-generated content, and their attitudes toward ethical issues in academic writing.

3.3. Participants and Sampling Procedure

The sampling procedure adopted in this study follows a non-probability convenience sampling technique. Fifty-six students drawn from four intact classes enrolled in courses taught by the researcher at the English department of the Ecole Normale Supérieure Assia Djebbar, Constantine completed the questionnaire which was distributed to them via the Google Forms link: https://docs.google.com/forms/d/1lsk2PomrPpZUbv5EIkotdRVrA5H0rYabJbJtbXEhJ_4/edit#responses. These classes were selected based on their accessibility and availability for the researcher rather than random selection from the wider student population. Due to the researcher's direct relationship with the participants and to avoid any potential ethical issues, students were informed that their participation was voluntary, that their responses would remain anonymous, and that there would be no academic consequences if they refused to answer the questionnaire.

3.4. Data Analysis

The data obtained from the questionnaire were saved in the same link then analysed using descriptive statistics, including frequencies and percentages for quantitative data (Questions 1-10), and thematic analysis for qualitative data (Question 11) to identify patterns in students' AI-mediated writing practices and perceptions.

4. Results

4.1. Participants' Background Information

Table 1: Students' Level?

Level	Number	%
Second year	28	50
Third year	2	3.6
Fourth year	26	46.4
Total	56	100%

As shown in table 1, the 56 participants are distributed across three academic levels. The majority were fourth-year students ($n = 26$), followed by second-year students ($n = 28$), and third-year students ($n = 2$). This distribution reflects that most participants belong to intermediate or advanced levels and are more likely to have considerable experience with academic writing tasks which may affect their interaction with AI-assisted writing tools.

Table 2: Students' English Writing Level

Writing Level	Number	%
Good	32	57.1
Average	21	37.5
Excellent	2	3.6
Poor	1	1.8
Total	56	100%

Table 2 displays students' self-reported writing proficiency and clearly shows that the majority rated their level as good ($n = 32$), or average ($n = 21$). Only two students thought that their writing level is excellent and only one student thought that it is poor. The results suggest that the participants generally perceive themselves as competent writers although only few of them consider their proficiency to be of an advanced level. This is important for the interpretation of reliance on AI tools in dealing with writing tasks.

4.2. Patters of AI Use in EFL Writing

Table 3: Frequency of Use of AI Tools for Writing in English

Frequency	Number	%
Sometimes	38	67.9
Rarely	5	8.9
Often	10	17.8
Always	3	5.4
Total	56	100%

As pertains to students' frequency of use of AI tools for writing in English, table 3 shows that the majority of the respondents sometimes use them ($n = 38$), and ten respondents often use them. Only three students always use them but five students never do so. These findings reveal that the use of AI writing tools is widespread among students but not constant, suggesting that they might use them for instrumental reasons, although the reported frequency does not indicate addiction to these tools among most participants. However, levels of dependence cannot be determined by frequency of use alone, hence, the necessity to examine students' actual engagement with content generated by AI.

Table 4: Types of AI Tools Used

AI Types	Number	%
ChatGPT or similar chatbots	49	87.5
Google Translate or other translators	3	5.4
QuillBot or other translating tools	3	5.4
Grammarly or other grammar checkers	1	1.8
Total	56	100%

Only students who answered the previous question by choosing *sometimes*, *often* or *always* were required to answer this question, however even the students who claimed that they never use AI tools in writing answered this question. This may suggest that they use them but not for writing tasks. Table 4 shows that the type of AI tools most used but students is ChatGPT and other similar generative chatbots ($n = 49$). Three students chose translators, three other students chose paraphrasing tools and only one opted for grammar checkers. The dominant AI tools are the generative ones, while traditional tools like Grammarly and translators are almost absent. This suggests that students do not use them simply to correct their writing but rather to generate content and as a cognitive support.

Table 5: Purposes for AI Tool Use?

Purposes	Number	%
Generating ideas or brainstorming	23	41.1
Vocabulary improvement	12	21.4
Rephrasing/Paraphrasing	10	17.9
Correcting grammar	4	7.1
Translating	3	5.4
Checking grammar and spelling	4	7.1
Total	56	100%

The table shows that most students ($n = 23$) use AI for idea generation or brainstorming, vocabulary improvement ($n = 12$) and rephrasing and paraphrasing ($n = 10$). In contrast, fewer students reported using AI for grammar correction ($n = 4$), translation ($n = 3$) and spell checking ($n = 4$). These results suggest that students use AI at the planning and ideation level rather than simply to correct linguistic errors. From the SRL perspective, this implies that students integrate AI into cognitively demanding stages of writing, particularly idea development and lexical expansion. In other words, when students critically evaluate and transform AI suggestions, this may represent cognitive scaffolding, but if they are passive recipients of AI, there is a risk of reduced independent idea generation.

Table 6: Engagement with AI-Generated Content

Engagement Manner	Number	%
I use it only for ideas and write everything myself	22	39.3
I use AI suggestions and modify them significantly	24	42.9
I use AI text and make minor modifications	5	8.9

I sometimes submit AI generated text with little or no modification	5	8.9
Total	56	100%

Table 6 demonstrates that the questionnaire respondents show different degrees of engagement with AI-generated content. Twenty two of them report that they use AI for ideas but write everything by themselves, 24 use AI suggestions and significantly modify them. On the other hand, 5 students use AI text and make minor modifications, and 5 others sometimes submit AI generated text with little or no modification. These findings show that most of the students remain actively involved during the writing process, however, 10 students (20% of the respondents) report behaviours that reveal potential dependence on AI, since they heavily rely on it during the writing process. It might be claimed at this point that for most students AI functions as a scaffold, but for some as a substitute.

4.3. AI Integration across Writing Stages

Table 7: Writing Stage when AI is Used

Writing Stage	Number	%
Before writing (ideas /planning)	27	48.2
During writing (drafting)	23	41.1
After writing (correcting/improvement)	6	10.7
Total	56	100%

Table 7 shows that AI is used across all writing stages, but is most present in the early and middle phases. Most of the students (27= 48.2 %) use it before the writing stage to generate ideas and prepare writing plans. On the other hand, 23 students use it while they are drafting their writing and only six students use it to correct or improve their writing after they finish it. The results obtained through these responses suggest that AI tools are used throughout all stages of the writing process but they are most present in the early and middle phases. This supports the idea that instead of being used to edit or correct the final written production, AI tools are mainly used to generate ideas and support the writing process. This pattern aligns with SRL theory, where planning and drafting are critical phases for cognitive engagement. However, it also raises concerns that AI may replace rather than support idea generation in some cases.

4.4. Students' Attitudes towards AI Use and Academic Integrity

Table 8: Students' Attitudes towards AI Use

Attitudes	Number	%
Acceptable in some situations	47	83.9
Not acceptable	6	10.7
Always acceptable	3	5.4
Total	56	100%

Table 8 reveals that students have a well-developed ethical awareness about AI use in writing. A majority of respondents (n = 47) believe that AI is acceptable only in some situation, while 6 of them think that it not acceptable. Only 3 students think that it is always acceptable.

9. Students' Undisclosed Use of AI-generated Content in Assignments

Answers	Number	%
Yes	23	43.4
No	16	30.2
Prefer not to say	14	26.4
No answer	3	5.4
Total	56	100%

Although responses to the previous questions revealed a high awareness about ethical use of AI in writing, students' answers shown in table 9 reveal a clear contradiction. Indeed, 23 students used AI to write assignments without admitting it, while 14 preferred not to say anything and 3 avoided to answer this question. Sixteen students, on the other hand, declared that they had never relied on AI to write assignments. Answers to this question and the preceding one reveal a clear gap between attitudes and actual behaviour, suggesting that although most of the students (83.9% in Table 8) are aware of ethical boundaries related to the use of AI in writing, they do not follow them all the time.

10. Students' Opinion about AI Regulated Use

Opinions	Number	%
Allow AI use	10	17.9
Limit it	45	80.4
Ban it	1	1.8
Total	56	100%

Table 10 reveals that the majority of students ($n = 45$) believed that teachers should limit AI use, thus confirming their awareness of ethical boundaries related to the use of AI which they had expressed in Table 8. Only 10 students thought that teachers should allow it and one student believes that they should ban it. These responses suggest that students themselves acknowledge the need for pedagogical control, rather than unrestricted use.

4.5. Qualitative Findings: Students' Perceptions of AI-Mediated Writing

Five major themes were revealed from the analysis of the students' responses to the open-ended question of the questionnaire: *'In your opinion, how has AI changed the way you write in English? Please explain your answer in a few sentences?'* These themes are:

1. AI as a cognitive scaffold for idea generation and organization
2. AI as linguistic support for vocabulary and accuracy development
3. AI as a tool for improving writing quality and academic style
4. AI as a potential source of dependence and reduced autonomy
5. Students' awareness of the need for controlled and responsible AI use

These themes show that depending on how they incorporate it into their writing processes, students perceive AI as a helping but at the same time as problematic technology.

4.5.1. AI as Cognitive Scaffolding for Idea Generation and Organization

The role of AI in generating ideas and organizing writing was the most repeated theme in students' answers. Many of them declared that AI was very helpful in overcoming difficulties of finding ideas, developing arguments and structuring essays. Some of them wrote: *"It allowed me to explore more ideas."*, *"It helps me generate new ideas in relation to the topic."* *"It helped me organize my ideas, enhance them, and develop a clear line of thoughts."* *"Personally, I struggle to find strong ideas but with the use of AI tools, it became so easy for me to look for appropriate ideas and extend them by myself."*

This theme suggests that AI is mainly seen by students as a cognitive support rather a correction tool. This supports quantitative findings that indicated that the most frequent purpose of the use of AI among students is brainstorming and idea generation. This use of AI corresponds mainly to the planning phase of writing from a SRL perspective. Students appear to use AI to activate ideas, explore possibilities, and organize their thoughts before they begin to write. Self-regulated learning is likely to be supported by such use, especially when learners assume responsibility for evaluating and modifying AI suggestions. However, a potential risk emerges from the respondents' answers. Excessive reliance on AI for the generation of ideas, may reduce the students' own engagement in one of the most important cognitive stages of writing: independent idea development.

4.5.2. AI as Linguistic Support for Vocabulary and Accuracy Development

The second theme that emerged from the thematic analysis is related to the role AI plays in language development. The respondents frequently mentioned vocabulary improvement, grammar correction, and better expressions. Some of their answers are: *"It improves my vocabulary when I search for the word that I didn't find."*, *"It helped me gain more vocabulary and better writing style."*, *"AI helps me learn new vocabulary and shows me how I write correct sentences."*, *"AI helped me improve my writing skills and enhance my vocabulary."*

These answers suggest that students consider AI as an easily accessible linguistic resource that helps them overcome their linguistic difficulties. This is especially relevant to EFL classes where effective writing is mainly hindered by vocabulary limitations and grammatical uncertainty. This theme reflects perceived usefulness from a TAM perspective. In other words, AI is accepted by students because they think it offers them immediate assistance that helps them write better and more accurately. However, the extent to which this assistance is educationally valuable depends on whether students learn from AI feedback or simply transfer responsibility for linguistic decisions to the tool.

4.5.3. AI as a Tool for Developing Writing Style and Academic Expression

AI influence on students' writing style is the third theme. According to students, AI helped them write clearer sentences, comprehend academic style, improve paragraph organization, use more academic vocabulary. Examples of their responses include: *"AI has changed my way of writing... I got influenced by the writing style of the chatbots."*, *"It helps me understand how the style of writing should be, how I organize ideas."*, *"AI assists me in boosting my style of writing by giving me more improved vocabulary."*

In relation to this theme, students perceive AI more than simply a grammar correction tool; it is rather a model of academic expression and rhetorical organization. This suggests that they believe that AI functions as a form of linguistic modelling that enables them to find different ways to express ideas. However, this finding needs to be approached with caution because excessive imitation of AI-generated academic language may result in weak development of students' authorial voice, even though it may improve their awareness of style.

4.5.4. AI as a Source of Dependence and Reduced Learner Autonomy

Awareness of possible negative effects of AI use is an important theme expressed by students. Many of them described this clearly by saying: *"It makes me dependent but at the same time I get some ideas."*, *"I became totally dependent on it to the point that I sometimes cannot write alone without using AI."*, *"It made me too reliant on it that I rarely write by myself."*, *"AI weakened my writing because I am always depending on it."*

The theoretical distinction between AI as assistance and AI as substitution is strongly supported by this theme. Students' responses related to this theme show that some students perceive AI as reducing their confidence and independent writing ability. The SRL perspective, in this regard, suggests that students' answers are indicators of possible difficulties in maintaining their control over cognitive processes. Students may be left with few opportunities to independently self-regulate their writing practice when AI replaces idea generation, drafting or decision-making. However, these responses should not be regarded as evidence that AI systematically decreases autonomy. They rather suggest that when students move from strategic use to psychological reliance, they become dependent on AI.

4.5.5. Awareness of Responsible and Limited AI Use

This theme is related to students' awareness that AI requires regulation. Some examples of students' responses that support this are: *"We should keep using it in a very limited way otherwise we will never be creative again."*, *"I avoid copying anything or relying 100% on what AI suggests."*, *"The actual writing remains my own."*

The students' answers that support this theme complement the quantitative findings related to ethical attitudes. Students generally do not reject AI; they rather call for controlled use. This indicates that students are aware of responsible AI practices. They understand the distinction between using AI as an assistive tool and allowing it to replace their intellectual contribution.

5. Discussion of Quantitative and Qualitative Findings

The present study aimed at exploring how Algerian EFL students engage with AI-mediated writing by examining their AI use patterns, how they integrate it into writing practices, their perceived benefits, possible reliance, and ethical views. A complex picture of AI-assisted writing was revealed after combining quantitative and qualitative findings. On the whole, AI seems to be perceived as a valuable writing support tool by students who use it to generate ideas, develop language and improve texts. Meanwhile, its potential risks related to excessive reliance and increased dependence are highlighted in the students' responses. Thus, the findings seem to indicate that AI can play different roles in students' writing processes; it can help them create ideas and develop language, but it can also substitute some aspects of independent writing. In what follows, quantitative and qualitative findings will be discussed in relation to the research questions guiding the study.

5.1. Patterns of AI Use in EFL Writing (RQ1)

The questionnaire results show that although they are used rather occasionally, AI tools have become an integral part of students' writing practices. Students show a clear inclination towards generative AI tools, especially ChatGPT, which suggests that they are shifting away from traditional AI writing tools such as translators and correctors towards tools that assist them in more complex writing activities such as idea development, organization, and language production.

This is further explained by the students' reported purposes of AI use, which are mainly brainstorming, vocabulary development, paraphrasing and mistake correction. These findings are reinforced by qualitative responses where participants referred to AI as a resource that enables them to overcome common difficulties they encounter when writing in EFL. For example, many of them mentioned that AI helps them "gain ideas," "organize thoughts," improve vocabulary, and correct grammatical problems.

From a TAM perspective, these findings suggest that students adopt and accept AI mainly because they perceive it as a useful and efficient tool that helps them address certain challenges when they write in English. In particular, these challenges seem to be related to difficulties with lexical choices,

idea generation, and linguistic accuracy. However, the findings also suggest that students are growing aware of the distinction between beneficial help and exaggerated dependence. Many participants emphasised that AI should be used as a support tool rather than as a replacement of personal writing effort.

5.2. AI Integration Across the Writing Process (RQ2)

The findings show that students use AI, not only for final correction, but rather across all the stages of the writing process for idea generation, argument organization and expression improvement. More insights are offered by the qualitative data to support this practice. Many participants declared that they use AI to assist them when they have difficulties to begin writing, develop arguments or organize paragraphs. Some participants, for example, explained that AI helps them create outlines, organize their ideas and find different possible ways to express themselves. These findings suggest that students have begun to use AI as a cognitive support when they approach the writing process. From a SRL perspective, using AI in this manner can be of great benefit to the learners and can function as scaffolding that supports planning and monitoring, provided that learners remain actively involved by evaluating, modifying and developing AI suggestions. However, there is a possible risk expressed in some responses. Dependence on AI tools for the generation of ideas instead of using it to extend their own thinking can reduce students' opportunities to practice planning independently. This suggests that the educational value of AI depends not only on when it is used but also on how students engage with its suggestions.

5.3 Students' Perceptions of AI's Contribution to Writing Development (RQ3)

The results show that students generally think that AI is a useful resource that supports their writing development. The quantitative findings indicate that students relate AI use with improved vocabulary, grammar, organization and overall writing quality. Qualitative responses also validate these perceptions. Students repeatedly claimed that AI helps them express their ideas more clearly, learn new vocabulary, and develop a more academic writing style. The qualitative data have also revealed that AI is not simply perceived as a correction tool, as many students viewed it as a source of writing knowledge. Some students explained that AI helped them understand how to organize paragraphs, construct clearer sentences, and recognize more appropriate expressions. This may imply that AI exposes students to other forms of idea expression and organization in such a way as to contribute to their increased writing awareness.

From a TAM perspective, these findings reinforce the importance of perceived usefulness in explaining students' acceptance of AI tools. The fact that AI helps students overcome common writing difficulties explains why students appear to value it. AI is seen as a practical learning resource in an EFL learning context often characterized by limited vocabulary and uncertain linguistic choices that hamper writing development.

At the same time, students seem to be aware of the risks of overreliance on AI writing tools on undermining their independent learning, as revealed by their qualitative responses. Many participants described AI as improving their writing, while some others expressed concerns that excessive reliance could reduce creativity, confidence, or the ability to write independently, thus giving rise to a potential contradiction between AI assistance and independent learning. The fact that students perceive AI positively, therefore, should not be regarded as evidence that AI automatically improves writing proficiency. Instead, the findings suggest that only when learners actively engage with feedback and use it as a learning opportunity can AI function as a support for writing proficiency.

5.4 AI Reliance and Learner Autonomy (RQ4)

Different levels of engagement with content generated by AI are revealed through the findings. Quantitative data showed that most students reported active engagement through such behaviours as using AI to help them generate ideas or modifying AI suggestions before including them into their writing. A smaller number of students, however, described behaviours that suggest possible reliance such as little modification of content generated by AI. Further insights about the nature of this reliance are provided by the qualitative responses. Many students clearly mentioned that they experienced difficulties to express themselves in writing without the help of AI. Some participants reported that frequent reliance on AI had made them unwilling to generate ideas by themselves and others that they feel that their creativity and writing confidence had decreased due to AI use. The significance of these responses is that they reveal that reliance is not simply a matter of how often students use AI, but also to their perceived ability to write in English without AI assistance.

From an SRL viewpoint, both quantitative and qualitative findings highlight the significance of learner control. Learners who show self-regulated behaviours tend to actively manage cognitive processes such as planning, monitoring and evaluating their work. These processes can be reinforced if AI is used as a support tool that provides feedback and alternatives. But it is used as a substitute to learner essential activities such as idea generation or drafting, there is a risk that opportunities for developing independent writing skills are reduced. However, the findings do not necessarily mean that AI is an inevitable threat to autonomy. Many students clearly explained that they engage with AI in a positive way. For example, they use it for brainstorming or error correction, but they express their own ideas and write their own texts. Thus, the main issue is not whether AI is used at all or not, but whether students actively make their own decisions while they are writing.

5.5 Students' Ethical Perceptions of AI Use (RQ5)

According to the findings, students hold balanced views about AI use in EFL writing. They generally support controlled and responsible integration rather than unlimited use or complete rejection of AI. This suggests that they are aware of both the academic benefits of AI use and the possible risks associated with inappropriate use. The qualitative responses also highlight this awareness. Many students stressed the assistive value of AI rather than its use as a substitute for personal effort. Students recurrently mentioned the importance of using their own ideas instead of directly copying generated suggestions and moderately using AI. This suggests that students are aware of the link that exists between learner responsibility, authorship and AI use.

However, the findings also point to a clear contradiction between students' ethical awareness and their actual behaviours. Some reported practices indicate uncertainty about acceptable boundaries, especially in relation to how much AI generated content can be incorporated into EFL writing, even though students are conscious of the importance of responsible use. This suggests that students need some guidance on acceptable AI practices. Instead of completely restricting AI use, higher education institutions should develop AI literacy practices that help students understand what constitutes responsible use, transparency, and the importance of preserving their own authorship.

5.6 Overall Interpretation of Findings

An overall view of the findings indicates the Algerian students' use of AI in writing is characterized by a balance between technological use and learner autonomy. From the TAM viewpoint, it is possible to understand that students adopt AI tools because they find them useful, accessible and helpful in overcoming writing difficulties. On the other hand, the SRL viewpoint reveals that what

accounts for the educational value of AI is how students engage with it. AI can support learning when students use it to brainstorm different ideas, improve their language and receive feedback and correction while the final written product is their own responsibility. However, if they use it to substitute personal effort, such as thinking, generating ideas and writing for them, AI can undermine their autonomy. Therefore, the major problem is not whether students should use AI or not but how they can develop the necessary skills to use it in a responsible, critical and autonomous way.

6. Conclusion

6.1. Summary of Main Findings

This study investigated how writing tools assisted with AI are used and how their influence on writing practices is perceived by EFL Algerian students. Based on students' responses to a questionnaire that combined both quantitative data with qualitative insights, patterns of AI use, its integration across writing stages, perceived benefits, possible reliance and ethical considerations were examined. The findings were analysed and explained through complementary TAM and SRL perspectives. It was found that students use AI as an integral part of their writing practices mainly to brainstorm ideas, develop vocabulary, and improve their text organisation; and they think that AI tools are useful which explains why they adopt them. Nevertheless, a more complex reality was also revealed: many students use AI tools as complements to their personal writing efforts, but others acknowledge that their experience with the use of such tools has led to increased reliance and reduced confidence in independent writing.

6.2. Theoretical Contribution

The contribution of the present study to the debate about AI-assisted writing lies in highlighting the value of combining technology acceptance and learning regulation perspectives. The TAM perspective helps in understanding the reasons for the students' adoption of AI on the basis of their perceived usefulness. On the other hand, SRL provides insight into how students engage with these tools and whether AI supports or hinders learner autonomy. The findings obtained show that the effects of AI writing tools are not related to the use of these technologies themselves, but rather to how critically students engage with them and self-regulate their learning.

6.3. Pedagogical Implications

This study has some pedagogical implications. Higher education institutions should develop clear guidelines about responsible and transparent use of AI writing tools, instead of considering them only as threats to academic integrity. Teachers of EFL writing should help students learn how to use AI tools for brainstorming, feedback and language development but insist that they maintain ownership of their ideas and written production. These teachers should also teach their students to use AI-generated content in a critical way, instead of passively accepting it.

6.4. Limitations

This study has some limitations. The first one is that the sample was limited to only 56 EFL students from the Ecole Normale Supérieure Assia Djebar, Constantine, and this restricts the generalizability of the findings. The second one is that the study is based only on self-reported perceptions and practices, and this may not objectively reflect students' actual behaviour when using AI tools. The third limitation is that the questionnaire was designed for exploratory purposes rather than for statistically validating TAM or SRL constructs. In order to investigate the influence of AI use on writing development over time, subsequent research could use larger samples, longitudinal designs, writing performance analysis, and validated instruments.

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