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QuillBot as a writing partner: Effects on EFL learners' autonomy and attitudes

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ABSTRACT

This study investigates the effects of QuillBot, an artificial intelligence (AI) writing assistant, on fostering autonomy among English-as-a-foreign-language (EFL) learners. Using a mixed-methods approach, including questionnaires and semi-structured interviews, the research examined how learners utilize QuillBot to enhance their learning processes, set objectives, and make decisions related to language learning. While previous research suggests that AI can promote learner autonomy, there is limited understanding of QuillBot's specific role and learners' attitudes toward it. The study involved 41 female university students who completed questionnaires, and 10 students participated in interviews. Results indicated a significant positive impact of QuillBot on learners' autonomy and engagement in writing courses. The findings contribute valuable insights into how AI tools like QuillBot can support autonomy and foster positive attitudes in EFL contexts. Additionally, the study offers practical recommendations for language teachers and policymakers on effectively integrating QuillBot into language-learning programs. Such integration can enhance learner autonomy, improve attitudes, and increase engagement among EFL students, ultimately supporting more effective language acquisition and classroom participation.

Contribution/ Originality: This study aims to evaluate Quillbot's effectiveness as a writing assistant in fostering EFL learners' autonomy. It is among the few studies examining Quillbot's role in promoting learner independence and perceptions through a mixed-method approach. The research intends to address current literature gaps and contribute to SLA studies by providing insights from the EFL context.

1. INTRODUCTION

Learner autonomy has gained attention from scholars and educators since the early 1980s. Research in language learning highlights the significant impact of learners' psychology and internal experiences on the language acquisition process, emphasizing the importance of fostering independent learning skills to enhance language proficiency and overall educational outcomes. Studies of learner autonomy vary in their conceptual and theoretical frameworks, and there is a lack of agreement about the conceptualization of learner autonomy, as noted by Chong and Reinders (2022). Many concepts are used interchangeably with that of learner autonomy, such as self-regulation, learner psychology, autonomy-promoting teaching and learning practices, self-regulated learning, independent learning, and self-directed learning (Chong & Reinders, 2022). However, learner autonomy is considered an overarching concept. The concept

of learner autonomy evolved throughout the years. Early studies conceptualized it as a capacity or an ability. For example, Holec (1981) defined learner autonomy as "the ability to take charge of one's own learning" (p. 3). Recent studies of learner autonomy approach it as abilities that are demonstrated in learning behaviors inside or outside the classroom that show progress, such as reflecting, decision-making, independent action, involvement, awareness, intervention, and creation (Nunan, 1997). Little (2022) described autonomy as a learning system in which learners "plan, implement, monitor, and evaluate their own learning" (p. 1). Importantly, the concept of learner autonomy is commonly associated with other psychological constructs, such as motivation, self-efficacy, metacognition, learners' beliefs, anxiety, and awareness (Chong & Reinders, 2022).

Learner autonomy is supported by scholars in English-as-a-foreign-language (EFL) and English-as-a-second-language education. Recently, it has gained significance as a desirable outcome. An autonomous learner takes responsibility for their own learning, develops strategies, and monitors progress independently. To achieve autonomy, EFL learners should understand various learning strategies and apply them both inside and outside the classroom. Many studies have investigated the effect of learner autonomy on language skills, including writing (Abadikhah, Nambiar, & Kabilan, 2018; Baii & Guo, 2018; Na & Yoon, 2016), reading (Kavani & Amjadiparvar, 2018), speaking (El-Sakka, 2016), and vocabulary (Mizumoto, 2013; Noorbakhsh & Zeraatipishe, 2022).

With the advancement of technology, scholars in language teaching and learning investigated the effect of various technologies, such as mobile language learning (Shadiev, Hwang, & Huang, 2018), digital storytelling (Liu, McKelroy, & Shen, 2018), digital games (Sylven & Sundqvist, 2012), and chatbots (Agustini, 2023), on learners' autonomy. AI technologies utilize natural language processing (NLP) to analyze and simulate human conversations and writing, providing language learners with personalized assistance and feedback. These tools offer immediate feedback on performance, empowering learners to understand their strengths and weaknesses and manage their language development effectively. AI enhances motivation and confidence by creating a safe, non-judgmental, and supportive environment for learning, with tailored feedback and rich input. Consequently, AI influences learners' ability to control their learning process, set goals, internalize input, receive corrective feedback, and track progress. The capacity for self-regulation is vital in autonomous language learning, fostering independence and continuous improvement in language skills (Agustini, 2023; Susanti, Marcellino, & Chandra, 2017). Self-regulation involves taking responsibility for learning, setting goals, planning activities, evaluating progress, and reflecting on development to enhance personal learning effectiveness.

There is a significant gap in the literature regarding QuillBot's role in promoting language learners' autonomy. Consequently, this review examines studies on AI technologies' impact on EFL learner autonomy and attitudes, highlighting the need for further research in this area to better understand their influence.

1.1. The Role of AI Technologies in Promoting Language Learner Autonomy

Technology plays a significant role in language learning and fostering learner autonomy. AI tools like chatbots, mobile applications involving AI, and QuillBot are used in various empirical studies within language-learning environments, demonstrating their impact on educational outcomes. For instance, Chen and Wang (2019) investigated the effects of chatbots on Chinese EFL learners' autonomy and language proficiency. Their results showed a significant effect of chatbots on learners' self-directed learning and language proficiency due to the personalized content and feedback. Moreover, Li and Zhang (2021) revealed a positive effect of using a WeChat-based English-language learning program on autonomy and language proficiency. The platform offers EFL students interactive feedback via chatbots, quizzes, and online resources, significantly impacting learners' progress and promoting autonomous learning. Furthermore, Duolingo (2023) features interactive conversations, instant feedback, and personalized learning activities. Saraswati, Saraswati, and Purwati (2017) conducted a qualitative study and reported a positive impact of using Duolingo on EFL learners' autonomous learning. Their findings indicated that Duolingo improves EFL learners' motivation and attitudes toward autonomous language learning, as well as their

practical application of the language in real-life situations. Irzawati and Unamo (2023) also investigated the effect of Duolingo on EFL learners' attitudes and motivations. Their results indicated that the students believed that learning English through Duolingo was easy, fun, engaging, and motivating, and that they had positive perceptions and attitudes.

Further, mobile applications employing AI technologies, such as Lingualeo, have been explored in relation to language learning and autonomy. Yoo and Kwon (2021) results demonstrated that EFL Korean learners showed increased language gains and autonomy when they engaged in interactive learning experiences such as gamification, personalized learning activities, and online resources. In addition, Sariani, Amri, and Sulaiman (2022) revealed that incorporating mobile-based technology into English pronunciation learning improved EFL learners' pronunciation and expanded their practice options, enhancing their autonomous learning ability. Concerning writing, Wong and Nunan (2021) investigated the effect of the AI Writing Tutor chatbot on Chinese EFL learners' autonomy through the incorporation of instant feedback, gamification, and personalized and interactive learning activities. The study reported a positive effect of the chatbot on EFL learners' writing skills and autonomy.

1.2. QuillBot's Effects on EFL Learners' Writing Skills and Attitudes

Writing is the most complex skill that EFL learners must develop, and they face numerous challenges as they improve their writing abilities, requiring consistent practice and support. With the advancement of digital writing tools and AI technologies, EFL learners' writing skills are expected to develop rapidly given that these technologies support users' writing processes (Nobles & Paganucci, 2015) improve their abilities (Barrot, 2022; Coenen, Davis, Ippolito, Reif, & Yuan, 2021) and promote self-directed learning (Nazari, Shabbir, & Setiawan, 2021; Pokrivcakova, 2019).

Recently, several papers have pointed to the potential benefits of using QuillBot, an online tool for paraphrasing, to increase autonomy, motivate learners, help students write better, and avoid plagiarism. Fitria (2021) and Fitria (2022) highlighted the different ways in which QuillBot can paraphrase text and improve writing skills. These methods include the use of synonyms, word-order modifications, and sentence-structure alterations. According to Kurniati and Fithriani (2022), post-graduate students responded favorably to QuillBot because it improved their attitudes toward writing, possessed features that were easy to use, and improved their language development. Additionally, Nurmayanti and Suryadi (2023) discovered that students found QuillBot helpful in producing original academic writing easily. Overall, these studies point to QuillBot as an effective tool for improving language learners' writing skills and abilities.

The aim of this study is to examine the impact of QuillBot on EFL learners' autonomy and attitudes toward improving the writing process. Learners' interactions with QuillBot and their perceptions of using the tool are analyzed to determine whether QuillBot fosters self-directed learning and independence in writing tasks. Using both qualitative and quantitative methods, learners' levels of autonomy, motivation, confidence, and satisfaction are assessed when integrating QuillBot into their writing practices. Additionally, the study explores learners' perceptions of QuillBot's effectiveness in enhancing the quality of their writing, fostering creativity, providing feedback, and reducing writing anxiety. The research also identifies potential implications and challenges of incorporating AI tools like QuillBot into EFL writing instruction. By examining learners' experiences and feedback, the study offers insights into pedagogical considerations related to AI integration in the EFL classroom. Overall, this research aims to uncover QuillBot's effects on learners' autonomy and attitudes, contributing to the understanding of AI's role in education and language learning.

Considering the background, the study aims to answer the following questions clearly and concisely.

1. Does using QuillBot as an AI technology affect EFL learners' autonomy in language learning?
2. What are learners' attitudes toward using QuillBot to improve their writing skills?

2. METHODOLOGY

The study employed a quantitative approach, utilizing data collection tools to assess participants' autonomy before and after treatment. A questionnaire adapted from Zhang and Li (2004) was used, consisting of 21 items divided into two sections. The first section included 11 constructs rated on a five-point Likert scale from "Never" to "Always." The second section contained 10 questions where participants selected responses closest to their beliefs and attitudes. Modifications were made to suit the study's purpose, including adding a demographic section. For item 20, the original "Other" option was replaced with "QuillBot," and the word "writing" was added to all items for clarity.

Semi-structured interviews were conducted face-to-face with 10 participants, lasting between 20 and 35 minutes on average. All interviews were audio-recorded, transcribed in English, and minimally edited to remove repetitions, grammatical errors, and unnecessary details. When participants used their native language, responses were translated into English before data analysis.

To ensure the study's validity and reliability, the questionnaire was validated for content and face validity (Dafei, 2007). It was reviewed by two field experts who confirmed the clarity of language and the appropriateness of the content, leading to necessary revisions. For reliability, the questionnaire was piloted with 50 learners sharing similar characteristics with the study participants. Cronbach's alpha was calculated at 0.727, indicating acceptable internal consistency. Validity was further confirmed through a re-test conducted two weeks later. The correlation coefficients were 0.844 for the first section and ranged from 0.803 to 0.962 for the second section, demonstrating good test-retest reliability and consistency over time.

The most popular method for examining interview responses in qualitative studies is thematic analysis (Clarke & Braun, 2016). The audio files were transcribed by the researchers, who then performed a thematic analysis to examine them.

The total number of responses regarding students' opinions on using QuillBot as a paraphrasing tool to improve their writing was determined through frequency analysis. Simultaneously, interview data were analyzed thematically to identify codes and themes. The data were organized, classified, and examined to understand EFL learners' attitudes toward QuillBot and their experiences with the tool.

2.1. Participants

A convenience sample of 41 female EFL university students majoring in English language and translation was recruited. They were aged 21–24 years and enrolled in compulsory writing courses at a Saudi university's Department of English Language and Literature. Due to Saudi Arabia's gender-segregated education system, only females participated. Participants voluntarily agreed to participate, and to maintain confidentiality and anonymity, they were assigned codes. Table 1 describes the participants' demographic information.

Table 1. Demographic information of survey participants.

Variables	Years	Frequency	Percentage
Age	21–22 years	18	43.9
	23–24 years	23	56.1
How long have you been studying English?	6–8 years	21	51.2
	10–12 years	14	34.1
	More than 12 years	6	14.6

2.2. Data Collection and Analysis

Before administering the questionnaire, participants signed a consent form ensuring confidentiality and anonymity of the collected data, which would not impact their grades. To streamline data collection and analysis, the questionnaire was created on Google Forms and distributed during class. The researcher explained the purpose of

the study and remained with students until they completed the questionnaire, addressing any questions or clarifications. Participants took approximately 10 minutes to complete and submit their responses.

Before the experiment began, the experimental group received two hours of training on how to use the AI tool QuillBot. Subsequently, students incorporated QuillBot into their assignments. Over the eight-week period, a process-oriented approach to teaching writing was employed, involving multiple drafts and teacher feedback. Typically, feedback was provided through teacher corrections; however, in this study, QuillBot served as an artificial feedback tool, replacing traditional paper-based comments. Participants first drafted their essays in class within one hour, then used QuillBot at home to receive feedback and paraphrase sentences for improved accuracy, before writing the final draft in class. To verify effective use of QuillBot, students submitted screenshots of their work. Throughout the study, participants wrote eight expository essays on diverse topics such as language, society, and identity.

The questionnaire was administered to the experimental group before the experiment and again after eight weeks, at the end of the study. After coding the collected data, we used SPSS version 26. A non-parametric test, the Wilcoxon signed-rank test, was performed to examine changes in learner autonomy for both groups. Normally distributed quantitative data are reported as means and standard deviations (SD), while qualitative data are expressed as percentages.

Table 2. Tests of normality.

Variable	Test	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	Df	Sig.
Self-autonomy	Pre	0.086	41	0.200*	0.985	41	0.859
	Post	0.086	41	0.200*	0.986	41	0.873

Note: *: Lower bound of the true significance.
a. Lilliefors significance correction

3. FINDINGS

Table 2 shows the results of the normality assumption for perceived usefulness, evaluated using Shapiro-Wilk tests. The data followed a normal distribution; therefore, parametric tests, such as independent samples t-test and paired samples t-test, were used. Normally distributed data are presented as means with standard deviation (SD).

Table 3. Paired samples t-test analysis of self-autonomy.

Test	N	Mean	SD	T	P	Cohen's d
Pre-test	41	68.07	7.718	8.405	0. 001	1.313
Post-test	41	74.05	7.823			

Table 3 displays the mean value, number of cases, and SD of the pairs of variables compared in the paired samples t-test procedure and shows the results of comparing the mean scores of increases in learner autonomy in the post-test. The *t*-value for the two variables was 8.405. The criterion for statistical significance at $p < .001$, with a large effect size ($d = 1.313$).

The data in Table 4 shows that most items had averages indicating a response of "often," with values between 2.98 and 4.02. The overall average was 3.53, with a standard deviation of 0.375. Only two items reflected an "always" response.

Item no. 1 ("I think I have the ability to learn how to write English well") took first place. With a mean of 4.22, an SD of 0.852, a frequency of 84.4%, and the degree of response always, item no. 10 ("I know my strengths and weaknesses in my English writing studies") came in second place. Item no. 4 ("I can finish my writing task in time") placed third, with a mean of 4.02, an SD of 1.129, a frequency of 80.5%, and the degree of response "often." With a mean of 3.34, an SD of 1.087, a frequency of 66.8%, and a degree of response corresponding to "often," item no. 2 ("I make good use of my free time in my English writing studies") came in eighth. The penultimate rank was occupied

by item no. 3 ("I preview before the writing class"), with a mean of 3.24, an SD of 1.135, a frequency of 64.9%, and the degree of response "often." Item no. 6 ("I test myself by doing old exam papers that I have chosen myself") came in last with a mean of 2.98, an SD of 1.405, a frequency of 59.5%, and the degree of response "often." Based on these results, we conclude that the students' use of AI affected their learner autonomy positively.

Table 4. Descriptive statistics.

Items	Mean	SD	Min.	Max.	%	Level
I think I have the ability to learn how to write English well	4.37	0.829	3	5	87.3%	Always
I know my strengths and weaknesses in my English writing studies	4.22	0.852	3	5	84.4%	Always
I find I can finish my writing task in time	4.02	1.129	1	5	80.5%	Often
I choose books and tasks that suit my level: neither too difficult nor too easy	3.83	0.946	2	5	76.6%	Often
I reward myself, for example, by going shopping, playing games, etc., when I make progress in my writing	3.66	1.353	1	5	73.2%	Often
I keep a record of my writing studies, such as by keeping a diary, writing reviews, etc.	3.63	1.299	1	5	72.7%	Often
During the writing class, I try to capture opportunities to take part in activities such as pair/group discussion, etc.	3.59	1.024	2	5	71.7%	Often
I make good use of my free time in my English writing studies	3.34	1.087	1	5	66.8%	Often
I participate in activities outside class to practice and learn how to write in English	3.27	1.285	1	5	65.4%	Often
I preview before the writing class	3.24	1.135	1	5	64.9%	Often
I test myself by doing old exam papers that I have chosen myself	2.98	1.405	1	5	59.5%	Often
Total	3.53	0.375			70.6%	Often

The qualitative data on student autonomy was collected through interviews with learners. Participants responded to questions about their learning autonomy during and after using QuillBot. The interviews revealed mostly consistent results, indicating a significant increase in learning autonomy in EFL writing courses after using QuillBot. All students expressed positive attitudes toward the AI tool, describing their experience as "exciting," "positive," "happy," and "very helpful," and they considered themselves "satisfied." However, two out of ten participants reported initial challenges with QuillBot, particularly in understanding its functions and capabilities. QuillBot offers features such as paraphrasing, outlining, summarizing, translating, grammar and plagiarism checking, and citation creation. Consequently, students found using QuillBot more time-consuming at first, until they became familiar with its functionalities. They also noted that the tool improved their writing performance and increased their autonomy. All participants agreed they would be willing to use QuillBot in future writing courses. Selected interview excerpts are provided below.

"I feel excited to use QuillBot… QuillBot helped in finding mistakes and helped me to fix these mistakes." (S5)

"It was helpful. Improved grammar, punctuation, vocabulary." (S6)

"It helped me a lot. It helped in grammar, vocabulary, and yes, I would use it in my coming writing courses." (S7)

Another student expressed motivation and excitement about using AI applications like QuillBot in their writing course. Traditionally, they relied solely on the teacher for learning and feedback. However, QuillBot assisted in generating paraphrases and vocabulary, helping students improve their structural variety and word choice. This expanded their ability to select more precise language forms. After using QuillBot, students recognized its contribution to enhancing their writing accuracy and clarity, which positively impacted their skills. This was reflected in an interview excerpt where students acknowledged the benefits of AI tools in their writing development.

"I depend on both my teacher and myself for learning the language… I am intermediate-level… The course was exciting and not boring… It [im]proved my English… I will use QuillBot in my future courses because it will help me in structure and punctuation and building sentences… It helped me in summarizing sentences and writing full information in short sentences." (S8 NK)

Participants unanimously agreed that using QuillBot improved language accuracy, including grammar, word choice, and punctuation. However, none reported enhancements in writing fluency, idea generation, or recall of ideas. The focus was solely on language precision, with no perceived impact on other writing aspects.

The survey results and interviews suggest that using QuillBot in writing courses influences students' autonomy and writing skills. Teacher-designed activities involving QuillBot can enhance students' independence in learning, particularly in EFL writing courses, by fostering greater self-directed learning and skill development.

4. DISCUSSION

This study examined the use of AI technology, specifically QuillBot, in EFL classrooms and its impact on learners' autonomy and attitudes. Results showed students became more autonomous and engaged positively with the AI tool in writing classes. Participants reported favorable attitudes, and quantitative data confirmed a significant positive effect on learner autonomy.

4.1. Impact of AI Technology QuillBot on EFL Learner Autonomy

Autonomy in language learning involves learners independently acquiring the language, setting their learning goals, and taking responsibility for their progress. To evaluate QuillBot's impact on learner autonomy, a survey questionnaire and semi-structured interviews were conducted. The quantitative results indicated a significant positive influence of QuillBot on EFL learners' autonomy. This positive effect is likely because QuillBot provides enriching input that helps learners internalize new linguistic forms, such as grammatical structures and vocabulary, enabling correct usage. Additionally, QuillBot offers immediate, contextually appropriate feedback, although it may not always align with learners' proficiency levels. Understanding various structures and vocabulary enhances students' metacognitive strategies, linguistic repertoire, motivation, and creativity. These improvements are expected to foster greater learner autonomy and more positive attitudes toward AI tools and writing skills. The findings align with previous research on EFL learners' autonomy, suggesting that AI technologies like QuillBot can support autonomous language learning by providing valuable input and feedback that promote linguistic development and self-regulation (Chen & Wang, 2019; Li & Zhang, 2021; Saraswati et al., 2017; Sariani et al., 2022; Wong & Nunan, 2021; Yoo & Kwon, 2021). The positive effects of using QuillBot and other AI technologies on EFL learners' autonomy are significant. Pichugova (2016) emphasizes the key issues that impact the development of learner autonomy, including their objectives, needs, support, learning strategies, learner attitudes and motivation, and self-esteem.

4.2. Impact of QuillBot on EFL Learners' Attitudes toward Using AI Technologies in EFL Writing Classrooms

Regarding the second research question, the qualitative results revealed a significant positive effect of QuillBot on EFL learners' attitudes toward using it in EFL writing classrooms. The positive impact of QuillBot on learners' attitudes is attributed to its various properties and advantages over traditional web-based or computer-based technologies. AI technologies outperform others by providing tailored changes and feedback suited to learners' needs, along with multiple options to choose from. These findings align with numerous studies demonstrating the positive effects of QuillBot and similar technologies on EFL learners' attitudes and writing skills (Irzawati & Unamo, 2023; Kurniati & Fithriani, 2022).

Several limitations of this study should be acknowledged. First, the small sample size was due to convenience issues, including the timing and location of the experiment. Second, only EFL learners majoring in English participated, excluding learners from other majors, which may limit the generalizability of the findings to the broader

EFL learner population. Third, QuillBot was used as a representative AI technology; however, other AI tools might have different impacts on learners' autonomy and attitudes, given their significant differences. Future research should explore the effects of various AI technologies on the variables, skills, and contexts examined in this study. Additionally, because of its novelty, mixed-method research is recommended to better understand the multifaceted EFL experience with AI technologies and their influence on autonomy, language learning, and acquisition.

5. CONCLUSION AND IMPLICATIONS

This study demonstrates that the use of AI technologies, specifically QuillBot, positively influences EFL learners' autonomy and attitudes in writing classes. QuillBot helps engage students, promotes autonomous learning, and enhances learner satisfaction. Quantitative data from group comparisons show that students became more autonomous after using QuillBot. Qualitative findings support these results, indicating improvements in students' writing skills and their attitudes toward using QuillBot in class. The integration of AI tools like QuillBot offers several benefits for EFL students, teachers, and curriculum designers. Firstly, it boosts students' autonomy by providing a tool capable of generating accurate and coherent writing suggestions, enabling independent skill development and confidence building. Secondly, QuillBot fosters a positive attitude toward writing classes, as students perceive it as a supportive, non-judgmental assistant that helps them express ideas effectively. Thirdly, teachers benefit by saving time on individualized feedback, allowing focus on other aspects of language instruction. Curriculum designers can incorporate QuillBot into instructional materials to create more interactive and engaging learning experiences tailored to diverse learning styles. Lastly, the use of QuillBot can promote a growth mindset among EFL learners, as they realize that writing skills can be developed through active engagement with intelligent AI tools.

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Institutional Review Board Statement: This study was approved by the Institutional Review Board of College of Languages and Translation at IMSIU, Riyadh, under protocol number CLT489, dated 20, August 2024. Informed verbal consent was obtained from all participants, and all data were anonymized to protect participant confidentiality.
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Competing Interests: The authors declare that they have no competing interests.
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