

# Investigating The Role Of Artificial Intelligence In English Writing Fluency Among Iraqi University Students

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## Abstract

In today's world, technology has dominated almost every dimension of professional lives. In the realm of education, a bulk of research has confirmed the contributions of employing Chatgpt in enhancing English language learning skills especially writing. In this vein, the present study adapted a mixed-methods analysis to delve into the effect of employing AI in writing fluency and to identify the challenges of employing Chatgpt. To obtain the quantitative research objective, the researcher collected 120 university students from different Iraq universities. The range of participants' age was between 19 to 23 and their language learning experience varied from 7 to 10 years. To measure the participants' writing fluency, a sample of IELTS writing task was selected. The participants were divided into control and experimental groups in which the participants in the control group received the traditional writing instruction while their counterparts in the experimental received the mediating role of Chatgpt in giving feedback and comments for their writing performance. The data were analyzed through independent samples t-test. The results documented that the participants in the experimental group surpassed the performance of control group. In the qualitative part, eight instructors were chosen for running semi-structure interviews. Through analyzing the data via thematic analysis, several themes such as lack of digital literacy, lack of interest, and facilities were detected. Moreover, the findings were discussed in light of pervious findings and several implications were provided for teachers and teacher educators.

**Key Words:** Chatgpt, English students, t-test, Writing fluency

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## INTRODUCTION

A considerable number of empirical studies has substantiated the effectiveness of utilizing artificial intelligence tools in enhancing learners' English proficiency (Rahimi & Fathi, 2022; Liu et al., 2025). As an international language that provides desirable job opportunities around the world for those who are mastered in it, learning English has been an essential factor that students make attempt to being proficient in it. Scholars claim that English learners all over the world encounter numerous challenges in obtaining English language achievement (Gayed et al., 2022). Additionally, university students make effort to being proficient in English to continue their education and seek their desirable job positions. Furthermore, with the advance of technology applications in different dimensions of human lives, educational researchers and policymakers incorporated AI-assisted language learning tools in language learning programs that have caused learning more intriguing for English students (Chun et al., 2016). However, despite many contributions of AI-assisted language tools, learners encounter various emotional and cognitive challenges in progressing learning and sometimes the outcome is not consistent with the policymakers' expectations (Liu et al., 2025; Luckin et al., 2016). A source of such challenges could be related to using traditional teaching methods for a long time and lack of students' familiarity with technology-based instruction (William & Beam, 2019). In particular, the traditional methods cannot satisfy the current needs of scientific society, and subsequently demotivate learners from exerting more struggles. To diminish these problems, curriculum designers and policymakers have attempted to revolutionize the leaning achievement and engage them in learning assignments. To extend this line of research, the present study was designed to examine the effectiveness as well as the challenges of employing AI in developing English writing among Iraqi university students.

## 2. REVIEW OF LITERATURE

Due to technological dominance in educational systems around the world, digital tools and applications have started to become commonplace, especially in the classroom, and this creates an opportunity to expand the abilities of students to learn efficiently with the assistance of artificial intelligence (Reynolds & Kao, 2021). With respect to developing writing fluency, the contributions of AI tools have been confirmed consistently (Rahimi & Fathi, 2022; Ramesh & Sanampudi, 2022). For instance, providing learners with timely and appropriate feedback is of high significance in enhancing learners' achievement and sustaining their motivation to progress in learning assignments. Popenici and Kerr (2017) mentioned timely feedback as a kind of writing facilitator to promote university students' writing skill. With the aid of AI feedback in areas such as grammar, punctuation, and organization, students can obtain immediate corrections and alternative suggestions (Fathi & Rahimi, 2024; Mizumoto & Eguchi, 2023) which subsequently enrich their writing tasks. Moreover, AI tools have the ability to personalize learning experiences (Fathi & Rahimi, 2024; Xia et al., 2022; Xu & Wang, 2024) in which learners can adapt their writing skill and receive the sufficient feedback about their weaknesses and strengths in writing skill. Individual factors such as motivation, a sense of efficacy, and self-confidence play a decisive role in enriching learners' academic achievement. The significant effect of learners' motivation in technology-based learning has been documented. Motivated learners enjoy performing in a technology-based environment (Williams & Beam, 2018). There is a variety of reasons why technology-based instruction has attracted students and encouraged them to present their knowledge better than the traditional classrooms (Chen et al., 2023; Kim et al., 2019; Williams & Beam, 2018). The factors such as the interesting and intriguing environment have made the students attempt more to achieve their academic goals. Zhang and Zou (2021) conducted a systematic analysis of 34 research related to web-based writing. They found that technology tools like Google Docs offer students with well-designed and motivating learning context in which students' have high level of confidence; As a result, students obtain desirable outcomes in writing performances. Moreover, the large body of research has proved that learners' attitude toward the employment of technology is influential in dealing with AI (Cruz-Benito et al., 2019; Sánchez-Prieto et al., 2019). Abdullah and Ward (2016) realized that the learners' attitude toward technology impacted their adaptation of technology-based tools.

Chen et al (2023) conducted a research to explore EFL learners' perceptions about the advantages of the employment of Google Assistance in language learning. To obtain this aim, they collected data from distributing surveys and running interview with 29 college students. The findings proved that the participants felt satisfied from receiving feedback from Google Assistance especially in writing, speaking, and listening skills. They explained that the word pronunciation produced by Google Assistance was as natural as they themselves had, and they were easy to understand. Moreover, the participants with high level of proficiency performed better in listening skill than their peers with low level of proficiency. As the result documented, the lower achievement was related to their lack of language skills. They concluded that more attention should be devoted to the potentials of AI in promoting EFL learners' proficiency.

On the other hand, the employment of AI writing tools has negative influences on learners' creativity. It has been reported that learners employ these technology-based tools not just for revising their assignments, but also for developing novel ideas which would decrease their creative thinking and novelty (Johinke et al., 2023). Additionally, scholars argue that while AI tools can increase language abilities, they may not be critical in developing higher-order writing strategies, like argument structure (Marzuki et al., 2023).

Other disadvantages have been reported by international studies (Marzuki et al., 2023). As an example, research proved that learners rely on using AI writing applications without being careful about their mistakes and understand how they can correct their mistakes. They just want to revise their incorrect tasks. Such use of AI writing tools may disturb their natural learning process and self-regulated strategies. In this line, Iskender (2023) stated that the overuse of AI writing tools might decrease learners' critical thinking skills and consequently, learners might not learn how to develop writing skills. They mentioned that inappropriate employment of AI makes learners get quick help from AI tools which would diminish an effective writing development.

Concerning assessment issues, Yancey et al. (2023) investigated the effectiveness of technology-enhanced language learning tool and human raters in linguistic domain. They realized that technology-enhanced language learning tool had higher level of reliability for linguistic measures but lower level of reliability in evaluating rhetorical discourse and audience involvement. Additionally, Bui and Barrot (2024) found some limitations of the employment of ChatGPT stating that its scoring had some inconsistencies because of its dependence on probabilistic algorithms. These findings confirmed that AI should be employed to complement the process of writing measurement (Ramesh & Sanampudi, 2022). To have a better assessment of learners' writing tasks, the supervision of human instructors is needed (Ramesh & Sanampudi, 2022).

Alberth (2023) explored ChatGPT's potential in enhancing learners' writing performance. He found that ChatGPT can boost learners' writing skill offering novel idea and acceptable writing, but he was concerned about the ethical points. In another study, Imran and Almusharraf (2023) detected the challenges related to ChatGPT in writing assignments in a large sample of learners. Although, they found it as a valuable tool, they argued that AI should be used to complement a teacher's duty rather than replacing their professional practices in learning process especially in writing performance.

## **2.2. The purpose of the study**

Reviewing the literature, a considerable number of advantages as well as disadvantages in numerous dimensions of teaching English language have been highlighted (Noliy et al., 2023; Yan, 2023). However, the advantages of employing AI have not been fully considered in Iraqi universities. It seems that Iraqi university students need to move in line with new technology advances in their learning process especially in their writing skills. They can gain appropriate feedback to help them identify and rectify errors quickly, foster a more efficient revision process. Therefore, there is lack of knowledge concerning the effectiveness of AI applications in empowering Iraqi students' attitudes toward the contributions of AI tools in writing achievement. In this vein, this study covered the related gap.

The literature has evidenced that English learners hold satisfactory attitudes towards integrating AI tools in developing their English language skills. However, due to the fact that a significant part of effective implementation of technology-based applications needs a comprehensive analysis of contextual preparation including the students' performances in dealing with AI tools and their perceptions regarding the benefits and probable challenges, the present study was addressed. Therefore, the following research enquiries were formulated to cover the research purposes of the present study.

RQ1: Is the employment of AI tools effective in enhancing university students' writing abilities?

RQ2: How are the contributions and challenges of utilizing AI tools shown and manifested in university students' perceptions?

## **3. METHODOLOGY**

### **3.1. Design of the study**

The present study adopted a mixed-methods approach to answer the research questions. Regarding the quantitative part, an experimental design was developed in which the participants were divided into control and experimental groups. Data were calculated through running independent samples t-test. The participants' perceptions were scrutinized through conducting semi-structured interviews and interpreted via thematic analysis.

### **3.2. Participants**

The participants of the current study constituted of 120 students from different universities in Iraq. The participants' English level were upper-intermediate and advanced. The sample encompassed both male and female students (male=70, female=50) whose age ranged from 19 to 23. The researcher selected a purposive sampling to cover the research objectives of the present study, that is the researchers tended to ensure that the participants had the required level of English language proficiency and had the expected familiarity with employing AI tools in obtaining feedback and comments. The demographic features of participants are presented in Table 3.1.

Table 3.1. *The Demographic Features of Participants*

Factor	Categories	N
Gender	Male	70
	Female	50
English level	upper-intermediate	65
	Advanced	55
Age	19-21 years old	68
	21-23 years old	52

With respect to the qualitative part, eight instructors were selected. The participants were mainly female (5) and three were male whose teaching experience was between 12 to 17 years. All participants spoke English fluently.

### 3.3. Instruments

The instruments included a writing task which was used as pretest and posttest, with a rating scoring rubric. To measure learners' writing fluency, the sample IELTS was employed. IELTS has been considered a valid test that assess English language learners' proficiency level and its validity and reliability are confirmed among scholars worldwide. Therefore, in this study in order to measure the participants' writing, an essay writing (academic type) was selected from the book '*Cambridge Practice Tests for IELTS 16*'. To estimate inter-rater reliability of writing tasks, two independent raters were invited. The inter-rater reliability was found to be .82.

Table 3.2 indicates the inter-rater and intra-rater reliability of the pre-test and post-test scores.

Table 3.2 *Inter-rater Reliability of the Pre-test and Post-test*

Scorer	Pre-test	Average	Post-test	Average	Overall
Scorer 1	0.88	0.84	0.96	0.94	0.89
Scorer 2	0.80		0.92		

### 3.4. Data collection

The process of data collection started from March 2025 and finished in May 2025. The participants' proficiency levels were evaluated through a placement test administered by IELTS preparation institutions. The researchers selected participants from IELTS preparation institutions to ensure that the assessment of the participants' English language proficiency were done by expert IELTS assessors. With regard to participants' consent, the researchers explained the objective of this study and gained their consent forms before their participations. Moreover, they were assured that their responses were confidential and participation were not mandatory.

### 3.5. Data analysis

In the quantitative part, participants' scores on writing performance in the pretest and posttest were statistically analyzed using T-test. In the qualitative part, the participants' instructors were interviewed to investigate whether the employment of AI was effective in the participants' writing fluency, and the related challenges of applying AI from instructors' viewpoints were explored. To analyze the participants' responses, the researcher used thematic analysis.

To address it, first, the researcher examined all data for the purpose of preliminary coding. Then, the researchers coded data individually and based on the similarities among participants' responses, they were classified into specific categories. Furthermore, the researchers studied the categories carefully to ensure no new category was obtained and the categories were saturated. As a critical procedure in checking the validity, researchers are recommended to give the interpreted data to participants to check whether the results would match their responses. To achieve this purpose, the researchers invited an instructor with sufficient experience to examine the analyses. After giving some comments, she confirmed the process. Table 3.2. indicates that all three interview items have acceptable interrater reliability.

Table 3.2. *Interrater Reliability of Interview*

Item	Percent agreement	Scott's Pi	Cohen's Kappa
Item 1	85	0.85	0.86
Item2	100	1	1
Item3	92	0.92	0.93

## 4. RESULTS

### 4.1. The findings of the quantitative part

To answer the first research question, investigating the difference between the means of control and experimental groups in terms of the effect of employing Chatgpt in enhancing writing fluency of Iraqi university students, independent samples t-test was conducted. Table 4.1. presents the description of control and experimental groups:

Table 4.1. *Descriptive Statistics of Writing Posttests for Control and Experimental Groups*

	N	Minimum	Maximum	Mean	Std. Deviation
Control	60	4.00	4.75	4.25	3.45
Experimental	60	4.75	6.00	5.50	3.87
Valid N					

As indicated in this table, the mean of experimental group ( $M=5.50$ ) is higher than that of the control group ( $M=4.25$ ). Moreover, the standard deviation in control group and experimental group equals ( $SD=3.24$ ) and ( $SD=3.45$ ) respectively. To see whether these differences are statistically significant, the independent samples t-test was calculated. Table 4.2. presents the results of this analysis.

Table 4.2. *Independent Samples Test of posttests*

t-test for equality means					
	t	df	Sig. (2-tailed)	Mean difference	Std. error difference
	-3.41	58	.000	-14.23	1.56

According to this table, the difference between the means of participants' writing performances in control and experimental groups is significant. It confirms that the treatment is effective and the participants in the experimental group received higher scores in writing task ( $t=3.41$ ,  $p<.05$ ). Therefore, the null hypothesis is rejected.

### 4.2. The findings of the qualitative part

With regard to the second research aim, exploring the challenges of utilizing Chatgpt, the analysis of semi-structured interviews indicated three themes including lack of instructor's digital literacy, lack of familiarity with technology-based instruction, lack of technology facilities, and lack of students' interest.

#### 1. Lack of instructor's digital literacy

The analysis of data showed that instructors need the essential skills in employing the artificial intelligence tools. With limited experience, the instructors feel unsatisfactory and do not obtain the expected results. The following excerpts illustrate it:

*The use of ChatGPT is helpful for improving students' language skills especially in writing skill since it's a complicated and difficult skill for the students. But using AI needs especial training without which we cannot obtain what we are looking for. (P1)*

Another participant pointed to instructor's training as the first step in gaining fruitful outcomes of using technology in our classes and mentioned that: *In the first place, the instructors themselves should have*

*the sufficient knowledge about using artificial intelligence because the students always ask questions and the instructor has to answer carefully. Without enough knowledge, the instruction is not effective. (P4)*

Similarly, another participant stated that:

*I'm an instructor and I see the necessity of digital literacy. If we're not provided with the required knowledge, we will fail in our teaching. (P5)*

### **2. Lack of facilities**

The analysis of data illustrated that a well-organized implementation of AI requires its especial facilities. Equipped with sufficient technology facilities can contribute to fruitful and comfortable employment of AI. The following excerpts show it:

*"Every change in educational system needs preparation. If the high schools are provided with enough facilities, we don't face many problems in using technology-based instruction." (P6)*

Similarly, another participant remarked that:

*When there is lack of facilities related to technology tools, both the teachers and students feel bored and unmotivated. First, the authorities should think about the necessary conditions about using technology tools and then act the new changes. (P9)*

Moreover, participant five added her views and stated that:

*Facilities are the main part of successful learning. Without facilities, most of teacher's efforts are useless.*

### **3. Lack of interest**

The analysis of data indicated that low level of motivation can hinder the effective use of AI tools in the classroom. Motivation should be cultivated to obtain successful results. Furthermore, lack of motivation may lead to anxiety and discouragement among students. The following examples explained it:

*I as a teacher cannot increase the students' achievement when they're not interested in using technology. The student factor is an important factor in gaining fruitful results.*

In a similar line, another participant remarked that:

*One of the significant things that teachers should do in the classroom is the way they deal with students' emotional well-being. When students feel comfortable in using new things, they are motivated to continue their lessons.*

One participant elaborated that:

*High level interest is of utmost importance in using technology tools since most parts of education gradually become dependent on technology tools. It's a teacher's duty to help students to engage in learning tasks.*

Another participant stated that:

*Demotivated students are really problematic to deal with especially when we want to use AI in both instruction and assessment but we have to tolerate them because they have to learn the fundamental things about AI.*

## **5. DISCUSSION**

The present mixed-methods study was designed to examine the effectiveness of Chatgpt in developing writing among Iraqi university students and to scrutinize the instructors' perceptions towards the challenges of employing artificial intelligence applications in developing university students' writing fluency. The quantitative findings yielded from independent samples t-test confirmed it significantly. The findings can be justified in terms of the participants found more engagement in learning assignment with the aid of obtaining feedback and comments from Chatgpt due to its helpful alternative suggestions and interguing nature (Chun et al., 2016; Rahimi & Fathi, 2022; Xia et al., 2022). Employing Chatgpt enhances the advantages of process-oriented approach to writing development. As the research consistently indicated, the employment of Chatgpt could be tailored with the students' academic needs; therefore, the students are able to seek help from Chatgpt whenever they need it and experienced an individualized learning. In this regard, Su et al., (2023) claimed that the employment of Chatgpt plays a contributory role in extending EFL learners' writing skill since they can be offered specific feedback pertinent to their writing performances and benefit from an interactive writing development.

Furthermore, the students can be motivated to take responsibility, be independent, and make sufficient attempt to achieve, as a consequence, they become self-regulated in practicing language skills

(Lei et al., 2022; Liu et al., 2021). The indispensable attributes presented by AI-assisted language tools create an atmosphere to cultivate students' autonomy in and curiosity to potential abilities. Fostering students' encouragement in employing ChatGPT can diminish their anxiety level and lead them to take careful risks in generating successful language performance (Reynolds & Kao, 2021). These issues were corroborated by the analyses and interpretations of the participants' interviews. The findings illustrated that students' motivation in carrying out the English writing tasks is boosted since the feedback and guidance they obtained would be brilliant in the challenges encountered in their writing activities.

However, implementing any innovation is not without its limitation or lack of success (Lin et al., 2022). In this study, the qualitative findings showed that lack of instructors' digital literacy could hinder the achievement of fruitful outcome. To minimize these effects, the participants narrated that the required workshop training should be held to promote the instructors' awareness of utilizing technology-based instruction which is one of the educational demands in today's education system. As Vähäsantanen (2015) mention, teachers are at the frontline of implementing educational innovations. Consistent with this claim, curriculum designers and policy makers emphasize on teachers' and instructors' professional development especially these days that the concept teacher autonomy has been highlighted. This matter has been supported by a considerable number of empirical studies conducted in the era of employing technology applications in classroom setting around the world (Chun et al., 2016).

Another important factor in applying AI tools to promote their writing was students' interest. According to Zimmerman (2002), when the students feel interested in completing a task, they make more effort and establish goals to achieve the desired achievement. To enhance students' efficacy, the instructors can develop and select the task that cognitively engage and motivate the students. Chun et al (2016) corroborated the impact of students' motivation in higher engagement in technology-based instruction in enriching writing tasks. They asserted that the learning activities should cover the motivational dimension of students to accelerate the learning process. They realized that as students expressed positive emotions to new environment, they were more willing to engage with learning activities presented in a new context.

Furthermore, the findings of the present study are in consistent with the previous studies. For example, Fathi and Rahimi (2024) confirmed the impact of students' positive attitudes in expanding instructors' professional functioning in enacting educational innovations. In alignment with these results, Royaei et al (2023) argued that students' positive attitudes towards the instructors' implementation of new instructional innovations had a positive effect in maintaining or hindering the instructors' subsequent actions. In particular, the students' satisfaction of their instructor's enactment of a new instruction could pave the way for effective teaching practices. They concluded that to optimize EFL instructors' professional exercises, they should take the students' perceptions and motivation towards their innovation in the classroom since the students are the main recipients of their teaching.

Based on the participants' claim, the achievement in the participants' writing could be attributable to the well-organized writing instruction, the student's preparedness, and the instructor's accessibility.

## 6. CONCLUSION

The quantitative and qualitative findings of the present study corroborated the contributions of AI tools in enriching writing skill. The qualitative interpretations provided a more profound understanding of the suitable conditions required for the employment of ChatGPT in the higher education context. These findings entail several implications regarding teacher educators. As the main factor, both instructors and students need to obtain the sufficient level of digital literacy to deal with technology-based instruction. To achieve this goal, curriculum designers and policymakers should incorporate the employment of AI tools in teaching programs; Therefore, the instructional objectives as well as expectations of students' achievements should be revised.

Moreover, the assessment of students' achievement with the aid of AI tools needs careful consideration. Students' achievement is shaped differently from that in traditional classes. Additionally, the participants mentioned that they felt comfortable in utilizing AI to seek help, gain alternative suggestions, and detect their weaknesses. Relied on these advantages of AI tool, instructors should hold

the workshop to train the students the ways they can employ AI since the students have different academic abilities and they are not at the same level.

As other research projects, this study has some limitations. First, the data were gathered from instructors with low level of experience in employing AI. So, more research is required to gain a comprehensive understanding of the challenges of AI and how they can be minimized. Second, the students participating in this study were in higher level of English language learning. To ensure the effectiveness of AI in developing writing fluency of elementary level and identify the probable challenges, more research enquiry is needed. Third, the qualitative data stemmed from the instructors within one session. Additional explorations through open-ended questions can make the analysis more fruitful.

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