

ARTICLE

Human versus artificial intelligence: A comparative study of teacher-guided ChatGPT and teacher feedback in English writing

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Abstract

This study was conducted during the 2025–2026 academic year at Tishk International University in Iraq. It aims to compare teacher-guided ChatGPT feedback and teacher feedback on the writing development of architecture students learning English as a foreign language. Students were divided into control and experimental groups, and a seven-week study was conducted with pre- and post-tests administered. During the study, the control group received teacher feedback, while the experimental group received ChatGPT feedback under continuous teacher guidance and pedagogical supervision, rather than unrestricted artificial intelligence use. Analysis of the data revealed that although both groups showed improvement in writing performance, the experimental group's post-test scores increased significantly more than those of the control group. Additionally, students in the experimental group reported positive perceptions of ChatGPT feedback. In conclusion, ChatGPT, when used under teacher guidance, is an effective tool for supporting students' writing skills.

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Citation: Kucuk, T. (2026). Human versus artificial intelligence: A comparative study of teacher-guided ChatGPT and teacher feedback in English writing. *Int J Systematic Innovation*, 10(4): 026170063.

[https://doi.org/10.6977/IJoSI.202608_10\(4\).0015](https://doi.org/10.6977/IJoSI.202608_10(4).0015)

Received: April 20, 2026**Revised:** June 9, 2026**Accepted:** June 17, 2026**Published online:** July 8, 2026

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Keywords: Artificial intelligence feedback; ChatGPT; English as a foreign language writing; Student perceptions; Teacher feedback; Writing development

1. Introduction

Artificial intelligence (AI) has rapidly begun to manifest itself in every aspect of life in recent years. These rapid developments in AI have led to significant changes, particularly in education. Unlike traditional teaching methods, the emergence of generative AI systems has created more interactive and personalized learning environments for students. Although foreign language lessons and especially writing classes have been conducted with teachers for many years, AI-powered tools are being used in many pedagogical fields because they offer automated assessment and individualized learning opportunities. The integration of AI tools into English as a foreign language (EFL) courses has accelerated students' learning processes and has virtually reshaped foreign language courses (Mahapatra, 2024). Recent studies have shown that this approach improves students' learning and academic writing performance, and enriches their learning experiences (Kara & Kucuk, 2023; Li *et al.*, 2024).

For EFL students, writing skills are the most challenging aspect of language instruction compared to other skills. This challenge is a common reality in all educational institutions worldwide (Bai *et al.*, 2022). Therefore, this topic has attracted the attention

of researchers in recent years, resulting in numerous studies and making it one of the most popular topics in research (Lee *et al.*, 2023). While researchers have conducted studies on a wide range of AI tools, ChatGPT stands out as a generative AI model, possessing a unique status (Kucuk, 2024). Some of the most compelling reasons for ChatGPT's rapid advancement and prominence in the EFL field are its potential to provide grammar corrections, vocabulary suggestions, and feedback to students regardless of time and location. Because of these features, most researchers argue that such AI-powered tools improve students' writing performance and motivation during the writing process (Alzahrani & Alotaibi, 2024; Werdiningsih *et al.*, 2024). While many studies have investigated the benefits of AI tools in EFL, the difference between AI-powered feedback and traditional teacher-led feedback remains a subject requiring further investigation. Examining the differences between traditional teacher-led and AI-powered feedback is of great importance. Identifying, examining, and analyzing these differences is crucial for a better understanding of the role of AI tools in EFL writing instruction.

1.1. Artificial intelligence in education

In recent years, education has benefited from the rapid developments in AI (Li *et al.*, 2024). Harry and Sayudin (2023) stated that, with the emergence of AI applications, the learning process, especially EFL courses, has become interactive. AI tools have begun to be used in an unimaginable number of areas in education. Among these, advantages such as content creation, providing feedback, and individualized learning can be listed. Similarly, Munaye *et al.* (2025) and Kucuk (2023) stated that AI tools used in education provide personalized support according to each student's specific needs. In another study conducted further afield, Polakova and Ivenz (2024) stated that one of the areas where students struggle the most in foreign language teaching is writing lessons. They added that thanks to AI, students receive instant feedback, especially in improving their writing skills. Students are not the only ones who benefit from AI tools. While students receive support according to their level and pace, teachers can also develop teaching methods according to students' needs with the help of AI.

Since today's students are accustomed to technology, they have not taken long to adopt AI tools. Anyone with a mobile phone, tablet, or computer can easily access AI applications and ChatGPT. While AI offers unlimited opportunities in education, it has also brought some pedagogical concerns (Salloum, 2024). Yan *et al.* (2024) emphasized that among these concerns, students become overly dependent and lose critical thinking skills. Many

studies have discussed whether AI tools will replace teachers, and Kucuk (2024) emphasized that AI tools, especially ChatGPT, can never replace teachers and can only be used as a supportive tool in education. In another experimental study, Munaye *et al.* (2025) emphasized that more effective results can be obtained if AI tools are used under the control and guidance of teachers.

1.2. Artificial intelligence tools in language learning

Artificial intelligence tools provide various benefits to both students and teachers in foreign language learning, as in all areas of education. In particular, Gardazi *et al.* (2025) emphasized in their studies that with the development of technologies such as natural language processing, language learning processes have become more interactive.

Nowadays, no teacher or student is inclined to conduct research or learn a language using hard copies as they used to. Students, in particular, are driven to find the quickest way to access information. Considering these characteristics, AI tools are frequently preferred because they provide rapid feedback to students who want to learn a language, correct their mistakes instantly, and offer appropriate words, especially when writing (Lee *et al.*, 2023). In another experimental study, Kasneci *et al.* (2023), after long-term research, stated that AI tools can support students' learning processes because they provide answers tailored precisely to the students' needs. Supporting this study, Dwivedi *et al.* (2023) described ChatGPT, one of the most preferred AI tools, as being like a suit tailored to students' needs. They argued that this application improves students not only in writing but also in reading and critical thinking skills.

The benefits that AI tools bring to students and teachers in the field of EFL, especially in writing classes, are significant. However, just as having the most professional tool in the world is meaningless if you do not know how to use it, the same applies to AI. One of the most debated issues among scholars is that it makes students overly dependent, as Werdiningsih *et al.* (2024) stated in their study. Human nature never prefers the long way. Another concern with the integration of AI tools, especially ChatGPT, into education is academic integrity (Munaye *et al.*, 2025). In this context, S, Guo *et al.* (2024) and Kucuk *et al.* (2025) emphasized that if AI tools need to be integrated into education, they should undergo prior teacher guidance. In a study supporting Werdiningsih's work, Barrot (2023) presented similar findings. In his academic work, he stated that AI tools are very beneficial in the students' learning process. However, he emphasized that students need to be provided with the necessary information and skills before integration. As a common conclusion of recent academic

studies, none have rejected AI applications (Kucuk, 2024; Li *et al.*, 2024). Following these statements, it is underlined that AI tools contribute significantly to students' language development, but that they need to pass through the teacher's filter during the integration phase, and that their pedagogical frameworks need to be properly defined.

1.3. ChatGPT and English as a foreign language writing instruction

Following its acceptance in education, ChatGPT has begun to attract considerable attention from students and teachers, especially in writing instruction and teaching (Yan *et al.*, 2024). Teachers, due to their busy work schedules, have long been looking for an assistant to make their work easier, and students needed an application they can use for help whenever they need it, without time or location constraints. As Kucuk (2024) stated, among AI tools, ChatGPT has been the one that best meets the needs of teachers and students in the EFL field.

Applications such as ChatGPT are increasing in popularity because they provide students with quick answers in areas such as giving ideas and correcting grammar when needed. Lee *et al.* (2023) emphasized that writing skills differ from other skills and highlighted the importance of providing students with prompt feedback after their writing assignments. Some teachers are unable to respond to students' written assignments in a timely manner due to their workload. For these reasons, it has been suggested that AI applications can provide students with immediate support and improve their writing skills in EFL (electronic flow) writing instruction (Lee *et al.*, 2023). Following a similar logic, Kohnke *et al.* (2023) stated that even if students become dependent on these applications, they still offer support such as idea generation and language correction.

Improving writing skills in the EFL field is a continuous challenge (Harry & Sayudin, 2023). According to Werdiningsih *et al.* (2024), one of the most important factors in the EFL field is providing feedback to students on writing instructions, but this process can vary depending on the feedback needed. S. Guo *et al.* (2024) emphasize that the best feedback to give to students on their writing activities is timely feedback. Rapidly developing technology and advancements in AI have made this possible. The use of AI, especially ChatGPT, in teaching language-learning skills, particularly writing, has shown a significant increase recently. Many studies have experimentally proven that AI is beneficial in teaching students' writing in the EFL field (Baskara, 2023; Han *et al.*, 2023). Along with these benefits, the use of AI tools such as ChatGPT in writing instruction has also brought about some pedagogical concerns. Imran

et al. (2024) emphasized that students' overconfidence in the answers they receive from ChatGPT prevents them from improving themselves. They also added that such applications can yield surprising results if used under teacher guidance. In support of this study, Shabbir *et al.* (2024) emphasized that, for students to achieve more efficient results in writing by using AI tools, it is necessary to clearly explain to them, within a set of rules, how much they should benefit from AI. Based on this information, the common idea emerging from these studies is that more effective results can be achieved when AI and teacher feedback are used together in a hybrid approach (Lee *et al.*, 2023; Li *et al.*, 2023; Zhao, 2023).

1.4. Human feedback versus artificial intelligence feedback in writing

Perhaps the most challenging aspect for teachers teaching students to improve their writing skills in EFL classes is feedback (Cheng *et al.*, 2025). Many scholars agree that teacher feedback plays a critical role in improving students' writing skills (Mahapatra, 2024; Polakova & Ivenz, 2024). The most important aspect for teachers is to approach students with compassion and provide guidance. This guidance can include areas such as text organization, grammar, and spelling correction. Hyland and Hyland (2006) stated that teacher feedback is not only aimed at correcting spelling errors, but also at guiding teachers and helping them produce texts more consciously. Teachers helping students develop their writing skills have long been known as a part of the traditional education model (Harry & Sayudin, 2023).

With the rapid development of technology and the entry of AI into education and the EFL field, teacher feedback has begun to become insufficient, and different approaches have been sought. Mekheimer (2025) emphasized that teachers are particularly inadequate in large classrooms and do not have enough time to provide feedback to each student. Similarly, Ferris (2014) stated that teachers sometimes find it insufficient to provide feedback to large classes, and that this negative situation reduces the quality of the feedback. Ferris also added that due to teachers' workloads, teacher feedback is inconsistent and may vary over time. Therefore, especially in recent years, researchers and even teachers themselves have begun to examine whether AI feedback can be an alternative to teacher feedback.

1.5. Research gap

In recent years, AI tools, especially ChatGPT, have attracted the attention of many researchers, and numerous studies have been conducted in this field. Many of these

studies examine the integration of these applications into foreign language teaching and the resulting outcomes. Going deeper, many of these studies emphasize that AI systems improve students' writing skills. Particular attention has been paid to the ability of AI tools to provide quick responses and correct writing errors. Gardazi *et al.* (2025) specifically focused on ChatGPT's ability to provide students with quick feedback. Similarly, Dwivedi *et al.* (2023) stated that AI tools, especially in English language learning, accelerate students' learning processes in ways similar to a teacher.

While many studies have investigated the role of AI tools, including ChatGPT, in the writing process, a considerable amount of research has also explored the role of the teacher in the writing process. A common conclusion from numerous studies is that teacher feedback is critical for improving students' writing skills. While Hyland and Hyland (2006) mentioned that teachers make positive contributions to students' writing skills, Lee *et al.* (2023) emphasized that teachers now struggle with large classes and that the feedback they provide is often delayed.

When we examine the literature, we see that studies have investigated either the advantages and disadvantages of AI feedback or the positive and negative aspects of teacher feedback. Studies comparing these two feedback methods are limited. More specifically, the number of studies investigating the effects of these two feedback methods on students' writing skills is extremely small. In this context, this study will make an important contribution to the literature by comparing the effects of AI feedback and teacher feedback on students' writing skills. Unlike many previous studies that focused either on AI feedback or teacher feedback separately, the present study contributes to the literature by examining a teacher-guided ChatGPT feedback model within an authentic EFL classroom context. In addition to comparing the effects of teacher feedback and AI feedback on students' writing performance, this study also investigates students' perceptions of AI feedback in a controlled pedagogical environment. Therefore, the study contributes both methodologically and pedagogically to the growing body of research on human-AI collaboration in EFL writing instruction.

1.6. Purpose of the study

The significant advancements in AI have created several advantages in English language learning. These advantages have led to the emergence of new teaching methods and different feedback techniques, particularly in foreign language instruction. Among AI tools, ChatGPT is one of the most popular and frequently used applications by students. ChatGPT plays a significant role in EFL due to its

ability to improve students' writing skills and provide rapid feedback. While students' writing tasks were traditionally handled by teachers for many years, the introduction of ChatGPT into EFL raises a significant question: how can this application contribute to this process?

For many years, EFL students have traditionally improved their writing skills with the help of teachers. With the introduction of ChatGPT, there are a limited number of studies comparing the feedback provided by AI tools with traditional teacher feedback. Beyond comparison, researching and analyzing students' perceptions of AI feedback is another area requiring further investigation. Therefore, the main objective of this study is to compare the effects of ChatGPT feedback and teacher feedback on the writing performance of EFL students. Additionally, it examines students' perceptions of teacher feedback and ChatGPT feedback. In this context, the following research questions were formulated:

- (i) Does ChatGPT feedback significantly improve EFL students' writing performance?
- (ii) Is there a significant difference between ChatGPT feedback and teacher feedback in improving EFL students' writing performance?
- (iii) What are EFL students' perceptions of ChatGPT feedback?

2. Literature review

2.1. The role of feedback in English as a foreign language writing

In EFL (educational learning), feedback is perhaps one of the most important tools for students in the area of writing. Many scholars state that feedback is a central factor in the learning process (Mahapatra, 2024; Munaye *et al.*, 2025). Teacher feedback given to students plays an important role over the years. It helps students improve their writing strategies and assists them in areas such as grammar and linguistics. Because teachers are constantly present in the classroom, they help students correct their mistakes during the writing process and facilitate guided learning (Yan *et al.*, 2024). Teachers' support contributes to students' self-development and their becoming independent writers (Hyland & Hyland, 2006; Yang *et al.*, 2025).

In addition to teacher feedback in the EFL field, Weng *et al.* (2024) stated that students' peers also play an important and positive role in this process. Thanks to peer feedback, students in EFL courses are encouraged to learn collectively and develop their ability to critique both their own and others' writing (Munaye *et al.*, 2025). Furthermore, perhaps the feedback students appreciate most is that provided by AI tools, because these tools

provide students with immediate and rapid feedback, helping them to access accurate information (Teng, 2024).

In short, feedback of any kind is indispensable for improving students' writing skills in EFL writing classes.

2.2. Teacher feedback in writing development

People naturally expect something in return when they give a gift or do something. This can be praise or a material reward. Similarly, in EFL (educational learning), students want feedback when they write. In this regard, teacher feedback is undoubtedly one of the main elements of learning. In their mixed-methods study, Asadi *et al.* (2025) examined the feedback teachers gave to students' writing work. They stated that this feedback improved students' writing motivation and, more interestingly, that combining teacher feedback with AI feedback to create a mixed feedback system yielded more efficient results. Similarly, in their study, Tu and Ego-ugan (2024) found that the feedback teachers gave to students' writing work affected students' emotions, and that students who received relevant feedback from their teachers both increased their motivation and did not repeat the mistakes they made.

When we examine more extensive studies, we see that they mostly discuss the strategic aspects of feedback teachers provide to students. For example, Mekheimer (2025) mentioned the importance of teacher feedback. He stated that this feedback automatically leads students to correct themselves over time. Furthermore, this feedback improves students' planning and self-control skills in their writing processes over time. Similarly, Hafidhoh and Augus (2025), in their comprehensive study, showed that teacher feedback improves students' skills in word choice, sentence construction, idea generation, and error correction over time. Overall, although technology and AI applications are driving progress, teachers remain essential in the EFL field to help students improve their writing skills (Weng *et al.*, 2024).

2.3. Artificial intelligence-generated feedback in language learning

The importance of feedback in the foreign language teaching process, especially in EFL lessons, has been the subject of many studies (Hyland & Hyland, 2006; Imran *et al.*, 2024). As a common finding, it is no longer possible to provide sufficient feedback to every student with traditional methods, especially in crowded classes. Especially in the last five years, a solution to this issue has been created by integrating AI applications into education (Alzahrani & Alotaibi, 2024). As Kucuk (2024) stated, technological developments in natural language processing have made language learning both effective and enjoyable for both

students and teachers. The main reason students benefit from and enjoy these AI applications is that they can give instant feedback on their work and correct mistakes.

When literature studies are examined in detail, we see that one of the main reasons students use AI applications so widely is that they receive answers exactly according to their needs (Asadi *et al.*, 2025; Gardazi *et al.*, 2025). Similarly, Kasneci *et al.* (2023) emphasized that AI tools make a positive contribution to students' academic success, especially in education. In another study, it was stated that AI tools guide students in EFL writing courses, especially in word selection and usage (Munaye *et al.*, 2025). However, despite the advantages of AI feedback, several researchers argue that the effectiveness of such tools largely depends on appropriate pedagogical guidance and teacher supervision.

2.4. ChatGPT in English as a foreign language writing instruction

When we examine the literature studies of the last 4–5 years, it is evident that the role of ChatGPT, one of the AI tools, has changed. Although it was generally used as a correction tool in the writing process when it first appeared, it has recently become a writing assistant. In his mixed-methods study, Kucuk (2025) stated that students used ChatGPT as an aid in writing lessons. In another academic study, Li *et al.* (2024) stated that ChatGPT provides comprehensive feedback to students during the writing process and, in this respect, supports teachers' traditional evaluation methods. Another important point that stands out in the same study is that, thanks to ChatGPT's instant feedback, students realize their mistakes more quickly.

Experimental studies on this subject have begun to increase in the literature. Jmaiel *et al.* (2025) observed that the writing skills of the experimental group students who took ChatGPT-integrated writing courses improved significantly. When looked at in more detail, advances in grammar, correct word choice, and writing quality come to the fore. In another similar study, Haerazi (2023) examined the aspects of ChatGPT that affected students in the classroom. As a result of their study, it was stated that this application served as a guide in writing lessons and helped students systematically improve their writing skills. Finally, Li *et al.* (2024) discussed the content production aspect of ChatGPT in their writing classes and said that this application almost befriended students in the text development process.

2.5. Comparing human and artificial intelligence feedback

The number of studies examining the differences between teacher feedback and AI feedback in the EFL field is

steadily increasing. The difference between the two types of feedback is evident not only in quantity but also in quality. Recent studies have shown that ChatGPT provides feedback more quickly and consistently compared to teacher feedback (K. Guo & Wang, 2024; Li *et al.*, 2024). Upon examining these studies, it is evident that ChatGPT places greater emphasis on students' text organization and linguistic aspects. On the other hand, it has been noted that teacher feedback is more selective and pedagogically more comprehensive for students (Li *et al.*, 2024). Based on these findings, it appears that AI feedback generally leads in terms of speed, while teacher feedback is more comprehensive in terms of educational guidance and support.

When examined from the students' perspective, these two distinct types of feedback each have their own strengths and weaknesses. A review of recent studies shows that students perceive teacher feedback as more reliable (Zou *et al.*, 2025). In the comparative studies presented, while teacher feedback is perceived as more reliable by students, AI feedback is noted for its speed and explanatory aspects (Zeevy-Solovey, 2024). These findings suggest that while AI feedback may be more functional, the majority of students still require teacher guidance.

A review of studies conducted over the past three years shows that integrating these two different types of feedback yields effective results (K. Guo & Wang, 2024; Zou *et al.*, 2025). Human feedback and AI feedback have been utilized in studies as two complementary pedagogical resources. Tran (2025) noted that AI feedback provides significant support, particularly in terms of grammar. In addition, teacher feedback is more consistent. In line with this information, K. Guo and Wang (2024) stated that combining the rapid AI feedback with the pedagogical and comprehensive teacher feedback in a hybrid manner will yield more accurate results. Recent studies on technology-enhanced learning have also emphasized the importance of learner engagement and interactive digital environments in language education. For example, Triantafyllou and Sapounidis (2026) highlighted that technology-supported learning environments can positively influence learner participation, engagement, and cognitive development when implemented within structured pedagogical frameworks. This perspective supports the present study's emphasis on guided AI integration in EFL writing instruction.

Overall, the literature presents mixed perspectives regarding AI feedback in EFL writing instruction. While several studies emphasize the speed, accessibility, and consistency of AI feedback, others highlight the pedagogical value and emotional support provided by

teacher feedback. These contrasting findings demonstrate that neither feedback type is sufficient on its own. Instead, recent research increasingly supports hybrid approaches that combine the immediacy of AI feedback with the pedagogical guidance of teachers. Therefore, the current study positions itself within this emerging debate by examining the effectiveness of teacher-guided ChatGPT feedback in an authentic EFL classroom context.

2.6. Theoretical framework

Within the theoretical framework of this study, two perspectives have been adopted: Sociocultural theory and the human-AI collaboration approach. Sociocultural theory argues that learning can occur through both social interaction and guidance. Meanwhile, the human-AI collaboration approach argues that AI can never fully replace a teacher and, on the contrary, should be supported as an aid to the teacher (Atchley *et al.*, 2024; Nithideechaiwarachok & Chano, 2024). Overall, a review of the studies reveals that the idea of considering both teacher feedback and AI feedback together is prominent. If these two feedback methods are considered together, a suitable foundation emerges for explaining the role of both teacher feedback and ChatGPT feedback in the EFL writing process (K. Guo & Wang, 2024; Kucuk & Daskan, 2024; Nguyen *et al.*, 2024).

In the context of sociocultural theory, feedback is not only aimed at correction. Feedback is mainly aimed at facilitating learning. In this view, teacher feedback has the role of enabling the writing capability of students to meet academic standards. According to Zhang and Zhang (2023), students will correct their writing and writing mistakes under teacher guidance and become independent writers. As Nithideechaiwarachok and Chano (2024) and Zhang and Zhang (2023) observed, AI tools offer students real-time feedback in the writing process, which is positively perceived by the students. They further pointed out that the learning worthiness of such feedback lies in how students use these corrections and how they are instructed by the teachers. Based on these arguments, the research that we discuss herein shows that feedback is not a one-way process but a learning process that can help students develop their writing.

The human-AI collaboration approach posits that in EFL, teacher feedback and AI feedback are not in competition; rather, they should complement each other. A review of studies conducted over the past 2–3 years indicates that AI feedback provides immediate, rapid feedback regardless of time and place, while teachers offer more directive and guiding feedback (Atchley *et al.*, 2024; K. Guo & Wang, 2024). Additionally, Zou *et al.*

(2025) stated that teacher feedback is more reliable than AI feedback, while noting that ChatGPT is more beneficial in terms of organization and revision. Similarly, Tran (2025) suggests that the integrated use of AI feedback and teacher feedback will yield more comprehensive results. In line with these statements, this study, while comparing teacher feedback and ChatGPT feedback, also theoretically supports the potential of using both sources together.

3. Methodology

3.1. Research design

This study was conducted to examine the effects of teacher feedback and ChatGPT feedback on the writing development of EFL learners. The study used a pre-test-post-test quasi-experimental design with a control group. Two existing classes at Tishk International University in Iraq were selected: one as the experimental group and the other as the control group. Before the study began, both groups were administered a pre-test, and a post-test was administered at the end of the study. During the seven-week study, students in the experimental group received feedback via ChatGPT 5.2. Students in the control group received feedback from their teachers. By administering pre- and post-tests to the students, we compared the performance of both groups before and after the study. This allowed us to examine the effects of the two different feedback methods.

In addition to these procedures, a 10-item Likert-scale questionnaire was administered at the end of the study to collect and analyze the experimental group students' opinions regarding the ChatGPT feedback. Through this Likert-scale survey, both performance-related data and data based on students' perceptions were collected.

3.2. Participants

Fifty A2-level EFL students enrolled in the Foundation English Course at Tishk International University participated in the study. The students were selected from the current Architecture department, with 25 assigned to the control group and 25 to the experimental group. The students' age range was between 17 and 20, and the group consisted primarily of Kurdish and Arab students. In terms of gender, the control group included 12 female and 13 male students, while the experimental group included 10 female and 15 male students.

The students' English proficiency was determined by the university's placement test. Approximately 1,500 students take this exam each year. Students who score 60 points or higher can proceed directly to their departments without English support, while those scoring below 60 points take a Foundation English Course alongside their

departmental courses for one year. The test assesses students' grammar, vocabulary, comprehension, writing, and speaking skills. Based on the results, the proficiency level of the participating students has been determined as A2.

3.3. Research context

This study was conducted as part of the Foundation English Course at Tishk International University. The Foundation English program is designed for students with limited English proficiency. These courses are offered at the university's language preparatory school to all students with limited English proficiency. The students participating in this study were architecture students enrolled in the Foundation English course as a preparatory program.

As part of this course, students were reading the A2-level edition of Cambridge Press's *Own It 2*. In these classes, students developed their reading comprehension, vocabulary, grammar, speaking, and writing skills. Students taking 10 hours of Foundation English per week attended a writing class during the last two sessions of the week. In these classes, students were required to write argumentative texts of 150–200 words. The texts written by the students were evaluated on content, organization, vocabulary, and grammar. The same criteria were used in both the evaluation rubric and the feedback process.

3.4. Data collection instruments

3.4.1. Writing pre-test and post-test

A pre-test and a post-test were administered to assess the writing development of the student participants at the beginning and end of the study. During the first week of the study, a pre-test on the topic "Do you think sports stars earn too much money?" was administered to both the control group and the experimental group. This topic is included in the textbook and was implemented after receiving approval from two experts in the field. For the post-test, the topic "Do you think money can buy happiness?," another argumentative topic from the textbook, was used to assess the writing skills of both groups at the final stage. Although the topics of the pre-test and final test were different, care was taken to ensure that the difficulty level and structure of both writing tasks were similar. In both tests, students were asked to write an argumentative text of 150–200 words.

3.4.2. Writing assessment rubric

The students' writing assignments and the texts they wrote for the pre- and post-tests were assessed using the rubric provided in the teacher's resource section of the *Own It* book. This rubric evaluates four main criteria:

- Content: 5 points.

- Organization: 5 points.
- Vocabulary: 5 points.
- Grammar: 5 points.

The students' written texts were evaluated on a total scale of 20 points. Throughout the study, the same rubric was used for both the control group and the experimental group. To ensure consistency in the scores assigned to the students' written texts, the same teacher monitored and evaluated them.

3.4.3. Student perception questionnaire

In the final week of the study, a 10-item Likert-scale questionnaire was administered to the students in the experimental group to assess their perceptions of ChatGPT. The questionnaire questions were adapted from the study by Y. Yang *et al.* (2025). Two experts at the university reviewed the 10 questions to ensure they were appropriate for the students' level:

- (i) ChatGPT helped me generate ideas more easily.
- (ii) ChatGPT improved my vocabulary usage.
- (iii) I felt more confident while writing with ChatGPT.
- (iv) I became dependent on ChatGPT while writing.
- (v) ChatGPT improved my grammar accuracy.
- (vi) Using ChatGPT made writing tasks less stressful.
- (vii) I believe ChatGPT should be integrated into writing classes.
- (viii) I critically evaluated ChatGPT suggestions before using them.
- (ix) ChatGPT helped me organize my ideas better.
- (x) I am concerned about the ethical use of ChatGPT in writing.

The survey was administered only to the 25-member experimental group. Since only the students in the experimental group received ChatGPT-supported feedback, the survey was not administered to the control group. In the Y. Yang *et al.* (2025) study, from which the survey questions were derived, the questionnaire was also administered only to the experimental group, and data on students' ChatGPT-supported feedback were collected.

A Likert-scale questionnaire was used in the study. The participating students selected a value between 1 and 5 by marking one of the options: strongly disagree, disagree, neutral, agree, and strongly agree. The prepared questions were sent to the students via Google Forms. The students answered the survey questions via their phones. The students' responses were collected digitally and analyzed using SPSS 29 (IBM, United States of America).

3.5. Procedure

The entire study lasted seven weeks and was divided into three stages.

3.5.1. Pre-test stage

In the first phase of the study, a pre-test was administered to both groups to determine the students' initial writing performance. In the pre-test, students were asked to write a 150–200-word argumentative essay on the topic “Do you think sports stars earn too much money?” The primary objective of this phase was to determine the writing levels of the experimental and control groups prior to the intervention and to establish whether the two groups were similar at the outset. The results from the pre-test were used as baseline data for comparisons at the end of the intervention.

3.5.2. Feedback implementation

Following the pre-test phase, the implementation phase of the study began, and students were assigned two separate writing tasks over the course of a seven-week study period. In the third week, students were asked to write 150–200-word argumentative essays on the topic “Do you think people can survive without education?”; in the fifth week, they were asked to write on the topic “Do you think people rely too much on technology?”

Following these writing assignments, the two groups received feedback in different ways. Students in the control group received written corrective feedback based on a rubric provided by the teacher. This feedback focused on the content, organization, vocabulary, and grammar aspects of the students' writing.

Students in the experimental group, however, received their feedback via ChatGPT 5.2. However, the students did not use ChatGPT independently. Instead, the process was conducted entirely under the teacher's guidance. Students were instructed on how to use ChatGPT, its usage limits were established, and appropriate prompts were provided under the teacher's direction. Students were expected to upload their writings to ChatGPT and request feedback regarding grammar, vocabulary, organization, and content. Thus, ChatGPT was used not as a tool that directly generates text for students, but as a feedback tool to help them improve their writing. Throughout this process, the teacher continued to play an active role, ensuring that students used AI in a pedagogically sound and controlled manner. Teacher guidance was implemented consistently throughout the intervention period. Before each writing activity, students received explicit instructions regarding the ethical and pedagogical use of ChatGPT. During the feedback process, the teacher monitored students' interactions with ChatGPT and ensured that students focused on revising their own writing rather than generating entirely new essays through AI.

To ensure consistency during the implementation process, all students in the experimental group received the same teacher instructions regarding the use of ChatGPT. Students were guided to use prompts such as: “Please provide feedback on my essay in terms of grammar, vocabulary, organization, and content without rewriting the essay for me.” The teacher consistently reminded students that ChatGPT should be used only for feedback purposes and not for directly generating essays.

In order to monitor compliance, students were asked to submit both their original drafts and the revised versions after receiving ChatGPT feedback. The teacher reviewed these drafts regularly to ensure that students followed the given instructions and used ChatGPT appropriately within the pedagogical boundaries established for the study.

3.5.3. Post-test stage

At the end of the intervention period, that is, in the seventh week, a post-test was administered to both groups. In the post-test, students were asked to write a 150–200-word argumentative essay on the topic “Do you think money can buy happiness?” Although the topics of the pre-test and post-test were different, care was taken to ensure that both tasks had a similar level of difficulty. The data obtained from the final test were used to determine the writing development students demonstrated at the end of the intervention process and to examine whether there was a significant difference between the two groups.

3.6. Data analysis

The data obtained from the pre-test and post-test were analyzed using descriptive statistics. First, the arithmetic means and standard deviations for the control and experimental groups were calculated. A paired-samples *t*-test was applied to determine the differences between the pre-test and post-test scores of the two groups. In addition, an independent-samples *t*-test was used to compare the post-test scores of the control and experimental groups to determine whether there was a difference between the two feedback methods.

Similar to the studies by Y. Yang *et al.* (2025), the survey results from the experimental group via Google Forms were reported using descriptive statistics to examine student perceptions. The mean and standard deviation were calculated to assess the overall trend in students’ responses to the survey items. Since this survey was administered only to the experimental group, no comparison was made between the two groups. The findings were interpreted in a descriptive manner.

In addition to these statistical methods, Cronbach’s

alpha was used to assess the survey’s internal consistency. This allowed testing the reliability of the survey items and the consistency of the results. A two-sided *p*-value of <0.05 was considered statistically significant.

4. Results

4.1. Writing performance results

This section presents quantitative findings on the writing performance of the study participants. Data obtained from the pre-test and post-test were analyzed using IBM SPSS Statistics 29. During the study, students’ scores were calculated, and statistical tests were applied to identify differences within and between groups. The SPSS results for the pre-test and post-test are as follows.

4.1.1. Pre-test results

Upon reviewing the test results, the mean score of the control group was 10.80 ± 2.00 , while that of the experimental group was 10.76 ± 1.90 (Table 1). These values were similar, indicating that the writing performance of the control and experimental groups was comparable at the beginning of the study. Additionally, the similarity of the standard deviation values suggests that the groups were equivalent and that appropriate groups were formed for the study.

Table 1. Descriptive statistics of the pre-test scores

Group	<i>n</i>	Mean	SD
Control	25	10.80	2.00
Experimental	25	10.76	1.90

No significant difference in pre-test scores was observed between the control and experimental groups, providing a basis for interpreting changes observed in the later stages of the study with greater reliability and consistency. Consequently, it further supports the hypothesis that any future differences are not directly related to the groups’ writing skills but are influenced by feedback.

4.1.2. Post-test results

The mean post-test score of the control group was 12.08 ± 1.71 , while that of the experimental group was 16.12 ± 1.36 (Table 2). The experimental group achieved a higher mean score than the control group, with a smaller standard deviation, suggesting that the results of the experimental group, that is, the students who received ChatGPT feedback, are more consistent.

Table 2. Descriptive statistics of the post-test scores

Group	<i>n</i>	Mean	SD
Control	25	12.08	1.71
Experimental	25	16.12	1.36

The results show that students in the experimental group who received ChatGPT-integrated feedback reported a more pronounced improvement in their writing performance. Nonetheless, an increase in writing performance was also observed among students in the control group who received teacher-centered feedback. However, the greater average increase observed in the experimental group suggests that the ChatGPT-supported feedback method is more effective. In short, while improvements were observed in both groups, the findings indicate that the writing skills of students in the experimental group who received ChatGPT-supported and teacher-guided feedback developed to a more advanced level.

4.1.3. Comparison of pre-test and post-test results

The paired-samples *t*-test showed a significant difference between pre-test and post-test scores for both the control group and experimental group (Table 3). However, this difference is even more pronounced in the experimental group. The mean difference between the pre-test and post-test scores for the control group was -1.28 ± 0.98 ($t_{(24)} = -6.53$, $p < 0.001$), indicating that students who received teacher-supported feedback showed significant improvement at the end of the study. Similarly, the mean difference of the experimental group was -5.36 ± 2.10 ($t_{(24)} = -12.77$, $p < 0.001$), suggesting that students who received ChatGPT-supported feedback also demonstrated a noticeable and significant improvement in their writing skills. Additionally, the mean difference in the experimental group was larger than that in the control group, indicating that the feedback provided to the experimental group was

more effective.

In addition to the statistical significance results, effect size calculations were conducted using Cohen's *d* to evaluate the practical significance of the findings. The effect size for the control group was moderate, whereas the experimental group demonstrated a very large effect size. These findings indicate that the improvement observed in the experimental group was not only statistically significant but also practically meaningful in terms of writing development.

When both results are considered, it is evident that both feedback methods used contributed to the students' writing skills. However, the larger mean difference and higher absolute *t*-value observed in the experimental group suggest that ChatGPT-supported feedback may have had a greater impact on students' writing skills than teacher feedback. As a result, students in the experimental group who received ChatGPT-supported feedback showed greater improvement in their EFL writing performance.

4.2. Comparison of ChatGPT and teacher feedback

The results of the independent-samples *t*-test presented in Table 4 compare the effects of ChatGPT feedback and teacher feedback on students' writing performance. According to the post-test results, the mean score of students in the experimental group ($M = 16.12$, $SD = 1.36$) was significantly higher than that of students in the control group ($M = 12.08$, $SD = 1.71$; $t_{(48)} = -9.25$, $p < 0.001$). This result indicates that the difference observed in the post-test is not due to chance and is related to the types of feedback administered.

The findings reveal that students who received ChatGPT-supported feedback performed better in writing than those who received teacher feedback. This suggests that feedback provided through ChatGPT 5.2 and under teacher guidance may be more effective in improving students' written expression skills.

4.3. Students' perceptions of ChatGPT feedback

Next, we analyzed data from the Likert-scale questionnaire adapted from the study by Y. Yang *et al.* (2025). Students

Table 3. Paired-samples *t*-test for the pre-test and post-test scores

Pair	Mean difference	SD	Standard error of the mean	<i>t</i>	df	<i>p</i>
Control group (pre-test vs. post-test)	-1.28	0.98	0.20	-6.53	24	<0.001
Experimental group (pre-test vs. post-test)	-5.36	2.10	0.42	-12.77	24	<0.001

Table 4. Independent-samples *t*-test results for post-test scores

Group	<i>n</i>	Mean	SD	<i>t</i>	df	<i>p</i>
Control	25	12.08	1.71	-9.25	48	<0.001
Experimental	25	16.12	1.36			

were given a 10-item Likert scale questionnaire and responded using the following options: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5). The scores students assigned on a scale of 1 to 5 were analyzed using SPSS 29, and the results are presented in Table 5.

Table 5. Descriptive statistics of students' perceptions of ChatGPT feedback (*n* = 25)

Item	M	SD
Q1	3.92	0.91
Q2	3.76	0.88
Q3	3.68	0.85
Q4	3.88	0.73
Q5	3.72	0.98
Q6	3.60	1.00
Q7	3.64	0.95
Q8	3.60	1.12
Q9	3.36	1.11
Q10	3.68	0.85

The students in the experimental group had positive attitudes toward ChatGPT feedback, with mean scores ranging from 3.36 to 3.92. These data indicate that the students' responses generally align with the statement "I agree." When the items were examined individually, item Q1 had the highest mean ($M = 3.92$, $SD = 0.91$), suggesting that ChatGPT feedback contributes to the writing process. Similarly, the high average for item Q4 ($M = 3.88$, $SD = 0.73$) indicates that students perceive ChatGPT feedback as supportive.

The mean scores for items Q2, Q3, Q5, and Q10 were also higher than those of the others, indicating that ChatGPT feedback is not only beneficial but also practical for them. Additionally, the standard deviation values were all around 1.00, suggesting that the students' responses are consistent and reliable. In particular, the lowest standard deviation was observed for item Q4 ($SD = 0.73$).

In addition to these benefits, item Q9 had the lowest average ($M = 3.36$, $SD = 1.11$), suggesting that students do not feel completely confident when using ChatGPT feedback. Overall, students exhibited a positive attitude toward ChatGPT feedback.

In addition to this information, Cronbach's alpha was calculated to assess the internal consistency of the survey. The α was calculated as 0.85, indicating good consistency reliability.

5. Discussion

5.1. The effect of ChatGPT feedback on writing development

The results suggest that ChatGPT-supported feedback improves students' writing performance. Although improvements were observed in both the control and experimental groups, they were more pronounced in the experimental group. This result suggests that ChatGPT's provision of quick and accessible feedback during the writing process helped students participating in the study identify their errors more quickly. With this early detection, students were able to refine their texts more accurately. These experimental findings align with the results reported by Mahapatra (2024) and Polokova and Ivenz (2024). In addition, Jmaiel *et al.* (2025) and Haerazi (2023) emphasized that ChatGPT-supported feedback and the application itself have a direct effect on writing development. Kucuk's (2024) study also presented similar findings, reporting that ChatGPT provides significant support to students in EFL classes. In both Kucuk's (2024) and Jmaiel *et al.*'s (2025) studies, the writing skills of EFL students who received ChatGPT feedback improved substantially.

5.2. Comparing human and artificial intelligence feedback

One of the positive aspects of this study is that students in the control group who received teacher feedback also showed improvements in their writing skills. This finding underscores the important role that teacher feedback plays in EFL writing instruction. Hyland and Hyland (2006), L. Yang *et al.* (2023), and Hafidhoh and August (2025)

reported that teacher feedback plays a significant role in developing students' writing skills. The current findings are consistent with their findings. A notable difference was that at the end of the seven-week study, the results of the experimental group were clearly higher than those of the control group. This result suggests that ChatGPT-supported feedback, when implemented under teacher guidance, may provide additional support for students' writing development compared to traditional teacher feedback alone. This strength of ChatGPT aligns with the view highlighted by K. Guo and Wang (2024) and Li *et al.* (2024) that AI-based feedback is more effective in terms of speed and accessibility. Based on these data, one should not conclude that teacher feedback is worthless. On the contrary, teacher feedback is more effective from a pedagogical perspective. ChatGPT's ability to provide quick and consistent feedback serves as a complementary tool for teachers.

It is important to note that the present study did not compare fully independent AI feedback with teacher feedback alone. Rather, the study compared traditional teacher feedback with teacher-guided ChatGPT-supported feedback. Therefore, the findings should be interpreted within the context of pedagogically supervised AI integration rather than as a direct comparison between AI and human teachers.

5.3. Pedagogical implications

This study suggests that ChatGPT cannot substitute for real teaching in EFL writing lessons and cannot write on its own. This tool should be used under teacher guidance, with feedback provided in this manner (Kasneci *et al.*, 2023). It confirms the idea, which emerges from the works by Barrot (2023), S. Guo *et al.* (2024), Imran and Almusharraf (2024), and Munaye *et al.* (2025), that AI should be controlled by teachers. It has been realized, as is the case in this specific study, that it is through tools that can offer students quick feedback in the Foundation English program that their writing can be supported. Another important aspect raised in this study is that students should use ChatGPT deliberately and within the teacher's guidelines. As this statement suggests, teachers should not only be able to motivate students to use technology, as Lee *et al.* (2023) observed, but also guide them in using it properly. From this perspective, this study emphasizes that AI tools should not be used haphazardly in writing classes. Establishing an outline of the pedagogical construct and delimiting it, followed by its implementation, will bring more productive outcomes.

5.4. Relation to previous studies

A review of recent academic studies generally indicates that

ChatGPT has a positive impact on EFL writing instruction. In this regard, the findings of this study align with the positive outcomes of ChatGPT feedback on students' writing development, as reported in the studies by Jmaiel *et al.* (2025), Li *et al.* (2024), Mahapatra (2024), and Polakova and Ivenz (2024). Additionally, the positive perceptions of ChatGPT feedback by students, as expressed in the questionnaire section of this study, are consistent with the findings of Teng (2024) and Zeevy-Solovey (2024). The findings also align with those of Kucuk's (2025) study conducted at Tishk International University. Both studies emphasize that when ChatGPT is used under teacher guidance, it contributes to students' writing skills and language development. Furthermore, unlike Tran (2025), the present study directly compared teacher feedback with ChatGPT feedback and demonstrated a more pronounced positive effect in favor of ChatGPT regarding writing development. In this regard, the study both supports and expands the existing literature. Another important contribution of this study is its focus on teacher-guided AI integration rather than unrestricted AI use. While several previous studies have examined the benefits of ChatGPT in writing instruction, fewer studies have explored how structured teacher supervision influences the effectiveness of AI-supported feedback in EFL classrooms. In this regard, the present study extends the existing literature by emphasizing the pedagogical importance of controlled and guided AI integration.

5.5. Implications for English as a foreign language teaching

Based on the data from this study, it is clear that ChatGPT is not a tool designed for directly generating text in EFL classes. In other words, it has become clear that this tool should be used as a supplementary material under the guidance of a teacher who provides feedback and instruction. ChatGPT can be used as a supportive tool in large classes where the teacher's resources are insufficient. A key point emerging from the study is that ChatGPT can never replace the teacher's role in providing feedback. It has been emphasized that this tool is more appropriately used under the teacher's supervision to support the teacher. Based on these findings, the importance of defining the application's limitations and ensuring proper guidance is now understood.

5.6. Limitations of the study

This study has certain limitations. First, the research was conducted exclusively with 50 A2-level students from the Architecture Department at Tishk International University. Therefore, caution is required when directly generalizing the results to other universities, departments, or proficiency

levels. Second, the study was conducted over a limited period of seven weeks; longer-term implementations may yield different results. Third, the student perception survey was administered only to the experimental group. Consequently, students' views on ChatGPT feedback and teacher feedback could not be directly compared. Fourth, the assessment of written performance was conducted by a single grader, which may have introduced some degree of subjectivity into the evaluation process. Future studies could strengthen scoring reliability by involving multiple raters and calculating inter-rater reliability coefficients.

Fifth, the quasi-experimental nature of the study may have introduced potential confounding variables that could not be fully controlled. Since the participants were selected from existing classes rather than randomly assigned, factors such as individual motivation, prior exposure to technology, and personal learning strategies may have influenced the findings. Therefore, the results should be interpreted cautiously and should not be generalized beyond similar educational contexts.

5.7. Suggestions for future research

This study, conducted in Iraq, is one of the first of its kind and will serve as an important resource for future research. If this study were conducted with a larger sample of students and students from different departments, it might yield broader results. Additionally, this would allow ChatGPT feedback results to be evaluated within a broader context. This study lasted seven weeks, but if future studies are conducted over a longer period, the long-term effects of ChatGPT feedback could be identified. This would enable an examination of how this effect impacts students' writing skills. This study examined the effects on students' writing scores. Future studies could also explore topics such as students' motivation or autonomy.

6. Conclusion

In the present study, the impact of the teacher feedback and ChatGPT-assisted feedback on the writing progress of EFL students was compared. The results indicate that both types of feedback enhanced students' writing performance. Students in the experimental group who received ChatGPT-assisted feedback scored higher on the post-test than those in the control group. Also, it was concluded that the perception of ChatGPT feedback by students was mostly positive. These findings suggest that ChatGPT, when used under teacher supervision and within a controlled instructional framework, may serve as a supportive tool for improving EFL students' writing skills. However, the findings should be interpreted cautiously due to the limited sample size and short duration of the study. Accordingly, the findings of the study should not be

interpreted as evidence that AI feedback independently outperforms teacher feedback. Instead, the results suggest that teacher-guided AI-supported feedback may provide additional support for EFL writing development.

Acknowledgments

None.

Funding

None.

Conflict of interest

The author declares no conflict of interest.

Author contributions

The author contributed solely to the article.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data

The data are available from the corresponding author upon reasonable request.

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