

The Effect of Using ChatGPT on Developing Written Translation Skills among Students in English Language Departments.

Abeer Rasmi Sa'ed

Palestine Technical University, kadoorie

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Abstract

The study aimed to investigate the effect of using ChatGPT on developing written translation skills among students in English language departments and to measure its effect on the overall level of these skills and their dimensions, namely semantic accuracy and meaning transfer, linguistic accuracy, stylistic and contextual appropriateness, and accuracy in the use of terminology and structures. The study adopted a quantitative quasi-experimental approach using a two-group pretest-posttest design. The sample consisted of 160 male and female students from three Palestinian universities, equally distributed between an experimental group that used ChatGPT within a structured educational intervention and a control group that was taught

using the conventional method. A written translation skills test was used as the study instrument, and the intervention lasted for eight weeks, comprising 16 instructional sessions. The results showed that the two groups were equivalent at the pretest stage ($p = .772$), whereas the analysis of covariance (ANCOVA) revealed a statistically significant and practically large effect of using ChatGPT on the overall level of written translation skills ($F(1,157) = 177.61, p < .001, \eta^2p = .531$) in favor of the experimental group. The results also showed a statistically significant effect across all four dimensions, with the largest effect observed in semantic accuracy and meaning transfer. The study concluded that the structured educational use of ChatGPT is

effective in developing written translation skills. It recommended integrating ChatGPT systematically into written translation courses, designing activities based on comparing students' translations with ChatGPT-generated suggestions and analyzing them, and training students to critically evaluate and verify the accuracy of generated outputs while maintaining the student's active role in translation decision-making.

Keywords: ChatGPT, written translation skills, students in English language departments, generative artificial intelligence, translation education.

* Introduction

In recent years, education has witnessed a rapid transformation as a result of the widespread use of generative artificial intelligence applications, which have provided new possibilities for content generation, feedback provision, and support for interactive and independent learning. The use of these applications has expanded beyond providing information to supporting learners in analysis, practice, and knowledge production, as demonstrated by electronic environments based on artificial intelligence applications in developing students' academic and research skills (Zahran Mohamed

Abdel Hakim, 2024). The growing integration of ChatGPT into educational contexts has also demonstrated its potential to support different learning processes through interaction, content generation, and guided practice (Meniado, 2023). In addition, the educational use of interactive chat applications has shown potential for developing students' knowledge and skills when integrated systematically into teaching (Alhajri et al., 2026).

ChatGPT is considered one of the most prominent generative artificial intelligence applications that has attracted increasing attention in education due to the capabilities it provides in dialogue, text generation, paraphrasing, summarization, offering linguistic alternatives, and providing immediate feedback. The literature has shown that ChatGPT offers multiple opportunities for developing English language teaching, learning, and assessment, while also presenting challenges that require its conscious pedagogical integration (Meniado, 2023). Studies have also demonstrated that ChatGPT can support the development of reading and writing skills among university students when used as part of the learning process (Alharbi, 2026). Furthermore, its use as a learning assistant has demonstrated

potential for supporting students' writing development through guided interaction and practice (Punar Özçelik & Yangın Ekşi, 2024).

The importance of ChatGPT is particularly evident in English language learning, as its conversational nature allows learners to practice the language, analyze texts, review vocabulary and structures, paraphrase content, and receive immediate feedback. Studies have shown an increasing use of ChatGPT by students in learning English and a diversity in the ways they benefit from it across various language practices (Ho, 2024). Findings also indicate the potential of using ChatGPT to develop the core language skills of students learning English as a foreign language (Al-Obaydi et al., 2025). Its effectiveness has also been demonstrated in enhancing English communication skills, reflecting its potential to support learners' actual language performance (Wang, 2025).

The significance of these capabilities increases when moving to written translation, as it is a complex linguistic and cognitive skill that requires understanding the source text and analyzing its meaning and context, followed by making decisions related to vocabulary, structures, terminology, and style in

order to produce an accurate and coherent target text. Studies have demonstrated the presence of ChatGPT in the training practices of translation students, which opens the way for examining its role in developing students' translation performance (Muftah, 2025). The increasing use of ChatGPT by English language learners in translation activities has also been observed, along with the associated new perceptions and practices in dealing with translation tasks (Yovi et al., 2026). Furthermore, applications of ChatGPT alongside neural machine translation technologies have demonstrated educational potential in tasks that combine language processing, writing, and translation (Xu & Wang, 2025).

Despite the growing interest in the use of ChatGPT in language, writing, and translation education, an important part of the literature has focused on students' perceptions, patterns of use, or the analysis of the tool's outputs, rather than on measuring the extent of improvement in students' actual translation performance resulting from the use of ChatGPT within a structured educational intervention (Yovi et al., 2026). Furthermore, research on ChatGPT in the training of translation

students highlights the importance of examining how its use can contribute to students' translation practices and skill development (Muftah, 2025). This need becomes increasingly important in light of studies demonstrating ChatGPT's effectiveness in developing productive language skills, particularly reading and writing, among university-level English language students (Alharbi, 2026). Accordingly, the current study seeks to investigate the effect of using ChatGPT on developing written translation skills among students in English language departments by measuring changes in their translation performance resulting from the use of the tool within a structured educational environment.

*** Study Problem**

The use of ChatGPT has become increasingly prevalent in English language learning and the completion of language-related tasks, including translation, due to the capabilities it provides in text interpretation, suggesting alternatives, paraphrasing, and linguistic revision. Studies have demonstrated the presence of ChatGPT in the training practices of translation students and in the analysis of its translation outputs (Muftah, 2025). Other studies have

also focused on students' perceptions and patterns of using ChatGPT in translation activities (Yovi et al., 2026). The literature has further demonstrated the possibility of integrating ChatGPT with machine translation technologies in educational tasks related to language and writing (Xu & Wang, 2025).

Despite this, there remains a need for quantitative evidence measuring the extent to which the structured educational use of ChatGPT contributes to developing students' actual performance in written translation, rather than being limited to examining perceptions, patterns of use, or the tool's outputs. This gap is particularly important in light of evidence demonstrating ChatGPT's ability to support the development of language skills among English language students (Al-Obaydi et al., 2025), its effectiveness in developing reading and writing skills at the university level (Alharbi, 2026), as well as its effectiveness in enhancing students' writing abilities through structured learning and practice (Boudouaia et al., 2024). Accordingly, the study problem lies in investigating the effect of using ChatGPT on developing written translation skills among students in English language

departments compared with the conventional teaching method.

*** Study Questions**

The study seeks to answer the following main question: What is the effect of using ChatGPT on developing written translation skills among students in English language departments?

The following sub-questions are derived from the main question: -
1-What is the level of written translation skills among students in the experimental and control groups before implementing the educational intervention?

2-Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) between the adjusted mean scores of students in the experimental group using ChatGPT and those in the control group learning through the conventional method in the overall score of the post-test of written translation skills, after controlling for the effect of the pre-test?

3-Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) between the adjusted mean scores of students in the experimental and control groups in the sub-dimensions of written translation skills, namely semantic accuracy and meaning transfer, linguistic accuracy, stylistic and contextual

appropriateness, and accuracy in the use of terminology and structures, after controlling for the effect of the pre-test?

*** Study Hypotheses**

To test the effect of using ChatGPT on developing written translation skills, the following null hypotheses were formulated: -

1-There are no statistically significant differences at the significance level ($\alpha \leq 0.05$) between the mean scores of students in the experimental group and the control group in the overall score of the pre-test of written translation skills.

2-There are no statistically significant differences at the significance level ($\alpha \leq 0.05$) between the adjusted mean scores of students in the experimental group using ChatGPT and those in the control group learning through the conventional method in the overall score of the post-test of written translation skills, after controlling for the effect of the pre-test.

3-There are no statistically significant differences at the significance level ($\alpha \leq 0.05$) between the adjusted mean scores of students in the experimental group and the control group in the sub-dimensions of written translation skills, namely semantic accuracy and meaning transfer, linguistic accuracy, stylistic and contextual

appropriateness, and accuracy in the use of terminology and structures, after controlling for the effect of the pre-test.

*** Study Objectives**

The study primarily aims to investigate the effect of using ChatGPT on developing written translation skills among students in English language departments by achieving the following objectives: -
1-To measure the level of written translation skills among students in the experimental and control groups before implementing the educational intervention.

2-To investigate the effect of using ChatGPT on developing the overall level of written translation skills among students in the experimental group compared with the control group learning through the conventional method, after controlling for the effect of the pre-test.

3-To determine the effect of using ChatGPT on developing the sub-dimensions of written translation skills, namely semantic accuracy and meaning transfer, linguistic accuracy, stylistic and contextual appropriateness, and accuracy in the use of terminology and structures, after controlling for the effect of the pre-test.

4-To estimate the effect size of using ChatGPT on developing the overall level and the sub-dimensions of written translation skills, allowing for the interpretation of the practical significance of the intervention alongside its statistical significance.

*** Significance of the Study**

*** Theoretical Significance**

The theoretical significance of the study stems from its examination of the use of generative artificial intelligence in the specialized field of written translation education, thereby contributing to enriching knowledge related to the role of ChatGPT in developing the linguistic and translation performance of students in English language departments. Its significance also lies in moving beyond the focus on students' perceptions and uses of artificial intelligence tools toward measuring the effect of using ChatGPT on actual translation performance through a set of skills that include semantic accuracy, linguistic accuracy, stylistic and contextual appropriateness, and accuracy in the use of terminology and structures. This contributes to providing a more comprehensive understanding of the nature of the relationship between the use of ChatGPT and the development of written translation skills.

*** Practical Significance**

The practical significance of the study lies in the possibility of utilizing its findings to develop methods of teaching written translation and to integrate ChatGPT into structured educational activities based on text analysis, comparison of translation alternatives, revision, and evaluation, rather than limiting its use to producing ready-made translations. The findings may also assist English language and translation instructors in designing educational activities that make use of the capabilities of generative artificial intelligence and contribute to the development of translation courses and student training programs on the effective and critical use of ChatGPT in a manner that supports their translation skills while maintaining their active role in the translation process.

*** Study Terms and Operational Definitions**

ChatGPT: A generative artificial intelligence application based on linguistic interaction that allows users to enter text-based instructions and questions and receive generated responses that can be employed in various language-related tasks, such as text interpretation, paraphrasing, suggesting alternatives, revision, and translation. Operationally, in this

study, it is defined as the tool used by students in the experimental group within structured educational activities in written translation, including analyzing the source text, suggesting and comparing translation alternatives, reviewing and improving the translated text, and evaluating translation outputs during the experimental intervention period.

Written Translation Skills: A set of linguistic and cognitive abilities that enable students to understand a written text in the source language and transfer its meaning into the target language accurately, correctly, and appropriately to the context. Operationally, they are defined as the score obtained by the student on the written translation skills test used in the study, which is measured through four dimensions: semantic accuracy and meaning transfer, linguistic accuracy, stylistic and contextual appropriateness, and accuracy in the use of terminology and structures.

Students in English Language Departments: Students enrolled in English language departments and programs at Palestinian universities who are registered in translation courses or related courses during the period of the study and who meet the participation criteria specified in the study.

*** Theoretical Framework and Previous Studies**

*** ChatGPT in English Language Teaching**

The emergence of ChatGPT has brought about a transformation in the use of generative artificial intelligence in language teaching, as it has enabled learners to interact with a system capable of generating texts, answering questions, paraphrasing, explaining vocabulary and structures, and providing immediate feedback. These features provide learners with opportunities for continuous language practice and text development beyond the limitations of time and place associated with traditional classroom instruction. The literature has demonstrated the multiple potential applications of ChatGPT in English language teaching, learning, and assessment (Meniado, 2023). Studies have also revealed students' tendency to use ChatGPT for various purposes in English language learning, reflecting the gradual integration of the tool into their educational practices (Ho, 2024). Another study demonstrated the potential of using ChatGPT in the English language classroom and its possible contribution to developing students' writing abilities when employed in a guided educational manner (Bai & Tawilapakul, 2023).

The educational value of ChatGPT increases when its use shifts from obtaining ready-made answers to employing it in activities that require learners to analyze, review, compare, and reformulate outputs. In this context, studies have demonstrated the effectiveness of using ChatGPT in developing reading and writing skills among university-level English language students (Alharbi, 2026). Its potential to support academic writing has also emerged through assisting in text development and revision, while emphasizing the need to consider the challenges associated with excessive reliance on artificial intelligence outputs (Yuan et al., 2024). This role extends to supporting the core language skills of students learning English as a foreign language, thereby enhancing the potential for its use in the university environment (Al-Obaydi et al., 2025).

The educational applications of ChatGPT also indicate that its effectiveness is not limited to direct language learning but extends to various educational contexts that rely on dialogue, interaction, and content generation.

Interactive conversational applications have demonstrated potential for developing educational concepts among learners when systematically

integrated into teaching (Alhajri et al., 2026). In language education, ChatGPT-based strategies have also demonstrated potential for improving students' English reading and writing skills through structured educational activities (Daza et al., 2024). Furthermore, its use as a learning assistant has been associated with the development of writing skills through guided interaction and engagement with generated feedback, reflecting the flexibility of the tool in supporting different learning practices (Punar Özçelik & Yangın Ekşi, 2024).

In the context of English language learning, studies indicate the expanding use of ChatGPT in developing different language skills, providing a basis for employing the tool in a more structured manner. Its use has demonstrated potential for enhancing students' English communication skills through opportunities for interaction and language practice (Wang, 2025). Research has also shown positive effects of ChatGPT on the writing abilities of undergraduate English students, indicating its potential to support productive language performance (Sultan et al., 2025). At the same time, students' attitudes, habits, and perceptions regarding the use of ChatGPT in English language

learning highlight the importance of pedagogical guidance to ensure that the tool supports rather than replaces students' active participation in the learning process (Ho, 2024).

The development of language skills through ChatGPT is influenced by how the educational environment is designed and how the tool is incorporated into learning activities. Research has demonstrated that ChatGPT-based didactic strategies can contribute to improving English reading and writing skills when implemented within structured learning activities (Daza et al., 2024). Similarly, ChatGPT has demonstrated potential for developing writing performance among English language learners when used as part of guided learning and revision processes (Boudouaia et al., 2024). Applications of ChatGPT in teaching English for specific purposes have also shown potential for enhancing specialized communication skills, indicating that its role can extend from general language skills to more specialized academic and professional performance (Pondelíková & Luprichová, 2025).

Taken together, the evidence indicates that the educational value of ChatGPT is not merely associated with its ability to generate texts, but

also with how it is integrated into the learning process and how students are guided to interact critically with its outputs. Studies have demonstrated its potential to enhance writing skills when used as a learning assistant that encourages learners to engage with, revise, and develop written texts (Punar Özçelik & Yangın Ekşi, 2024). Evidence from academic writing also emphasizes both the opportunities offered by ChatGPT and the challenges associated with its use, highlighting the importance of guiding learners to evaluate and revise generated outputs rather than relying on them automatically (Yuan et al., 2024). Furthermore, findings concerning the development of English communication skills support the importance of purposeful and structured interaction with ChatGPT in order to maximize its educational benefits (Wang, 2025).

*** ChatGPT and the Development of Written Translation Skills**

Written translation represents a linguistic and cognitive process that goes beyond the direct transfer of words between two languages, as it requires understanding the intended meaning of the source text, analyzing the context, selecting appropriate linguistic equivalents, and reconstructing the text in the target language in a way that preserves

meaning and ensures linguistic and stylistic accuracy. The emergence of ChatGPT has provided new capabilities that can be employed in this process, such as suggesting translation alternatives, explaining vocabulary and structures, paraphrasing, and reviewing translated texts, which has made its use increasingly present in the training practices of translation students (Muftah, 2025). Learners have also increasingly begun to use ChatGPT in translation activities, reflecting a shift in the nature of the tools used in language and translation learning (Yovi et al., 2026). This tendency is also evident among students outside English departments, whose perceptions of using ChatGPT for translating English texts indicate the growing presence of the tool in translation-related learning practices (Pimon, 2026). Furthermore, the integration of ChatGPT with machine translation technologies has demonstrated potential for supporting language tasks that require text processing and reproduction (Xu & Wang, 2025).

ChatGPT can be employed in translation education as a supporting tool throughout the stages of the translation process, whereby the student begins by attempting to understand and translate the text and

then uses the tool to obtain alternatives, compare linguistic choices, identify errors, and improve the final text. This pattern of use becomes particularly important when the student is responsible for evaluating the outputs provided by the tool and making the final translation decision rather than accepting them automatically. ChatGPT's potential to develop core language skills supports its use within such educational practices (Al-Obaydi et al., 2025). Its ability to support writing, revision, and text reconstruction processes also provides a basis for utilizing it to develop students' written performance (Yuan et al., 2024). Evidence from EFL contexts has similarly shown that the use of ChatGPT can contribute to developing writing skills when integrated into language instruction (Kulaksız, 2024). Moreover, its potential to enhance specialized communication emphasizes the importance of directing its use toward accuracy and contextual appropriateness when dealing with texts intended for different purposes (Pondelíková & Luprichová, 2025).

From a skill-development perspective, the educational value of ChatGPT does not lie solely in the quality of the translation it can

produce, but also in its potential to create an interactive learning environment through which students can practice analysis, comparison, revision, and decision-making. Research on ChatGPT as a learning assistant has demonstrated its potential to support students' writing development through guided interaction, revision, and engagement with generated outputs (Punar Özçelik & Yangın Ekşi, 2024). Other research has shown that ChatGPT-based instructional strategies can contribute to developing English reading and writing skills when incorporated into structured educational activities (Daza et al., 2024). Similar evidence has been reported regarding the enhancement of descriptive paragraph writing and English grammar among EFL students through a ChatGPT-based program (Mohamed Haggag, 2023). Positive effects have also been reported on the writing skills of ESL students in higher education contexts (Fatima et al., 2025). This is further supported by findings demonstrating positive effects of ChatGPT on the writing abilities of undergraduate English students (Sultan et al., 2025).

However, the use of ChatGPT in translation requires maintaining the student's active role, because relying on generated texts without

analyzing or reviewing them may transform the tool from a means of skill development into a means of completing the task on behalf of the learner. Therefore, its educational use should be based on comparing alternatives, identifying errors, justifying translation choices, and reviewing semantic, linguistic, and stylistic accuracy. This need is highlighted by studies that have examined ChatGPT outputs within the training of translation students (Muftah, 2025). It is also supported by evidence concerning the opportunities and challenges associated with the use of ChatGPT in academic text production (Yuan et al., 2024). The widespread use of the tool in translation activities among learners further emphasizes the importance of transforming such use from a spontaneous practice into a structured educational practice aimed at developing students' translation competence (Yovi et al., 2026).

*** Previous Studies and the Research Gap**

An analysis of previous studies reveals a clear trend toward employing ChatGPT and artificial intelligence applications in developing various educational and language skills. Research has demonstrated the effectiveness of ChatGPT-based instructional

strategies in improving students' English reading and writing skills, indicating its potential to support skill development when systematically integrated into instruction (Daza et al., 2024). This trend has also extended to writing performance, with studies reporting positive effects of ChatGPT on the writing abilities of undergraduate English students (Sultan et al., 2025). Furthermore, research on English communication has demonstrated the potential of ChatGPT to enhance students' communication skills, reinforcing the trend toward examining its effectiveness in increasingly specialized language skills (Wang, 2025).

At the level of English language education, a number of studies have examined the use of ChatGPT from various perspectives, including students' perceptions, language skills, writing, and communication. Findings have shown that students use ChatGPT for different purposes in English language learning, with perceptions and attitudes reflecting the tool's increasing presence in their educational practices (Ho, 2024). Evidence has also demonstrated the potential contribution of ChatGPT to developing the core language skills of students learning English as a foreign

language (Al-Obaydi et al., 2025). The findings have extended to more specialized skills, as the tool has demonstrated potential for supporting English communication in specialized and academic contexts (Pondelíková & Luprichová, 2025).

As for studies more closely related to translation, they indicate a growing interest in the role of ChatGPT in translation and educational practices. One study examined the impact of artificial intelligence on the training practices of translation students by investigating the translation outputs produced by ChatGPT (Muftah, 2025). Another study examined English language learners' perceptions and use of ChatGPT in translation activities, highlighting the actual presence of the tool in students' translation practices (Yovi et al., 2026). The literature has also addressed the application of neural machine translation and ChatGPT in English writing instruction and demonstrated the potential for integrating generative technologies into tasks that require text processing and reproduction (Xu & Wang, 2025).

A comparison of these research trends shows that the literature has provided important knowledge regarding the use of

ChatGPT in language learning, the development of certain language skills, students' perceptions of its use in translation, and the analysis of its translation outputs. However, there remains a need to examine its effect through a structured educational intervention that measures changes in students' own written translation skills. Furthermore, findings concerning the effectiveness of ChatGPT in reading and writing indicate the possibility of extending its effects to more complex language skills that warrant experimental investigation (Alharbi, 2026). Findings related to its use in academic writing also emphasize the importance of examining the effect of structured interaction with the tool on the quality of text production (Yuan et al., 2024). Moreover, its presence in the training of translation students makes it necessary to move beyond analyzing the tool's outputs toward measuring the extent to which students' translation competence develops as a result of its use (Muftah, 2025). Accordingly, the current study is distinguished by adopting a quantitative quasi-experimental design that compares a group using ChatGPT within a structured educational intervention with a group learning through the conventional method, while

measuring its effect on the overall level of written translation skills and their sub-dimensions.

*** Study Methodology**

*** Research Method and Design**

The study adopted a quantitative quasi-experimental approach using a non-randomized two-group pretest-posttest design, with verification of baseline equivalence between the two groups, as this design was appropriate for investigating the effect of using ChatGPT on developing written translation skills among students in English language departments. Experimental approaches generally provide a systematic basis for examining changes associated with an intervention and comparing performance under different conditions (Bartlett, 2024). The design included an experimental group that received an educational intervention based on the structured use of ChatGPT in written translation activities and a control group that studied the same content through the conventional method without using ChatGPT. The written translation skills test was administered to both groups before and after the intervention to measure changes in performance levels and compare the results between the two groups, while statistically controlling for the effect

of pre-intervention performance when estimating the effect of the intervention.

*** Study Population**

The study population consisted of students enrolled in English language departments at Palestinian universities who were registered in written translation courses or related courses during the 2025/2026 academic year. The study targeted this group because of the direct relevance of their specialization to the linguistic and translation skills under investigation, as well as their academic background in English and their initial experience in translation, which allowed for measuring changes in the level of written translation skills resulting from the educational intervention.

*** Study Sample**

The study sample consisted of 160 male and female students from English language departments at three Palestinian universities who were enrolled in translation courses during the study period. The study relied on intact classes, consistent with the nature of the quasi-experimental design, and the classes were then assigned to the two groups in a manner that ensured representation of the participating universities in both groups. The experimental group consisted of 80

students who received the ChatGPT-based educational intervention, whereas the control group consisted of 80 students who were taught using the conventional method.

Similarity between the two groups in terms of academic level and prior translation experience was taken into consideration, and their equivalence was statistically verified through the pre-test results. Participation required students to have completed at least one introductory translation course and not to have previously received specialized academic training in the use of ChatGPT for translation purposes. Students who did not complete both the pre-test and post-test or did not meet the minimum attendance requirement for the intervention sessions were excluded.

*** Study Instrument**

The study used a written translation skills test as the main instrument for measuring the effect of using ChatGPT. The test was designed to measure students' ability to translate texts from English into Arabic and consisted of four short translation tasks of comparable difficulty, covering general, academic, and media texts. The total score of the test was 100 points.

Students' performance was assessed using an Analytic Rubric

comprising four dimensions: semantic accuracy and meaning transfer (30 points), linguistic accuracy (25 points), stylistic and contextual appropriateness (25 points), and accuracy in the use of terminology and structures (20 points). The total score derived from these dimensions was used as an indicator of the overall level of written translation skills.

*** Validity of the Instrument**

To verify content validity, the test and the analytic scoring rubric were presented to a group of experts specializing in translation, English language, and language teaching methods to evaluate the suitability of the texts for the students' level, the clarity of the instructions, and the extent to which the scoring criteria represented the targeted skills. The necessary modifications were made in light of their comments. The instrument was also pilot-tested on a sample outside the main study sample to verify its clarity, the appropriateness of the difficulty level of the texts, and to determine the test duration, which was set at 90 minutes.

*** Inter-Rater Reliability**

Students' responses were independently scored by two raters specializing in translation using the same scoring rubric, with the raters

blinded to the students' group membership and the timing of the assessment. Inter-rater reliability was verified using the Intraclass Correlation Coefficient (ICC), which reached 0.93 for the overall score, while the values for the sub-dimensions ranged from 0.88 to 0.92, indicating a high level of agreement between the two raters.

*** ChatGPT-Based Experimental Intervention**

An educational intervention based on the structured use of ChatGPT was developed with the aim of enhancing the written translation skills of the experimental group participants. The intervention lasted for eight weeks, with two sessions per week, each lasting 90 minutes, for a total of 16 instructional sessions. At the beginning of the intervention, students received training on using ChatGPT in translation, formulating prompts, analyzing responses, and evaluating translation alternatives rather than accepting them directly.

The intervention required students to read the source text and analyze its meaning and context, then prepare an initial translation independently and use ChatGPT to obtain translation alternatives or explanations of difficult vocabulary, structures, and terminology. Subsequently, students compared

their translations with ChatGPT's suggestions, analyzed their strengths and weaknesses, and then revised the text to produce the final translation. The activities focused on semantic accuracy and meaning transfer, linguistic accuracy, stylistic and contextual appropriateness, and accuracy in the use of terminology and structures.

The control group received the same content, translation tasks, instructional duration, and number of sessions, but through the conventional method without using ChatGPT. Instruction was based on explanation, discussion, traditional linguistic resources, and teacher feedback. Thus, the content, objectives, and instructional time were standardized across the two groups, with the use of ChatGPT representing the primary difference in the educational intervention.

*** Study Procedures**

The study procedures began with administering the written translation skills pre-test to both groups to determine their initial performance levels and verify their equivalence. The educational intervention was then implemented over a period of eight weeks, while monitoring students' attendance and ensuring that the content, objectives, and instructional duration were

standardized across both groups. After the intervention was completed, the post-test was administered under standardized conditions. The responses were independently scored by two raters using the analytic rubric, with both raters blinded to the participants' group membership and the timing of the assessment.

To ensure that the acquired skills were measured independently, the use of ChatGPT or any machine translation tools was not permitted during either the pre-test or the post-test. Thus, the scores reflected the students' own performance levels rather than the quality of outputs generated by technological tools.

*** Ethical Considerations**

The ethical principles of scientific research were observed throughout all stages of the study. Participants were informed about the study's objectives, procedures, and the nature of their participation, and their informed consent was obtained prior to participation. They were also assured that participation was voluntary and that they had the right to withdraw at any time without any academic consequences. The confidentiality and privacy of participants' data were maintained, and the data were used solely for scientific research purposes, without including any personal information

that could reveal the participants' identities during data analysis or the presentation of the results.

*** Statistical Analysis Methods**

The study data were analyzed using IBM SPSS Statistics, with the level of statistical significance set at $\alpha \leq 0.05$. Means and standard deviations were used to describe the performance of the two groups in the pre-test and post-test measurements. The data were also examined to verify their compliance with the assumptions required for parametric analyses, including outliers, normality, homogeneity of variance, linearity of the relationship between pre-test and post-test scores, and homogeneity of regression slopes.

An Independent-Samples t-test was used to verify the equivalence of the two groups in the overall pre-test score. The Intraclass Correlation Coefficient (ICC) was also used to assess the degree of agreement between the two raters.

To test the effect of using ChatGPT on the overall level of written translation skills, Analysis of Covariance (ANCOVA) was used to compare the adjusted post-test means of the two groups after controlling for the effect of the pre-test. Multivariate Analysis of Covariance (MANCOVA) was also used to examine the effect of the intervention

on the four dimensions collectively: semantic accuracy and meaning transfer, linguistic accuracy, stylistic and contextual appropriateness, and accuracy in the use of terminology and structures. This was followed by univariate analyses of the sub-dimensions when the multivariate effect was found to be statistically significant.

Partial Eta Squared (η^2p) was also calculated to estimate the effect size of the intervention, along with adjusted means, standard errors, and 95% confidence intervals. Accordingly, the interpretation of the findings was based on both the statistical significance and the practical significance of the differences between the two groups.

* Study Results

The study results were presented according to the sequence of its questions and hypotheses, beginning with a description of the performance of the two groups in the pre-test and post-test measurements, followed by verification of their equivalence prior to the intervention, and then testing the effect of using ChatGPT on the overall level of written translation skills and their sub-dimensions.

* Descriptive Results of the Two Groups' Performance

The means and standard deviations of the scores of students in the experimental and control groups on the written translation skills test in the pre-test and post-test measurements were calculated, as shown in Table (1).

Table (1). Means and Standard Deviations of the Two Groups' Scores on the Written Translation Skills Test

Group	n	Pre-test M	SD	Post-test M	SD
Experimental	80	61.84	7.26	82.73	6.41
Control	80	62.17	7.11	69.46	7.02

As shown in Table (1), the mean scores of the two groups were similar in the pre-test measurement. The experimental group obtained a mean score of $M = 61.84$ ($SD = 7.26$), compared with $M = 62.17$ ($SD = 7.11$) for the control group. In the post-test measurement, the mean score of the experimental group increased to $M = 82.73$ ($SD = 6.41$), whereas the mean score of the control group reached $M = 69.46$ ($SD = 7.02$). Descriptively, these results indicate an improvement in the performance of both groups in the post-test measurement, with a greater improvement observed among the experimental group that received the ChatGPT-based educational intervention.

*** Equivalence of the Two Groups in the Pre-test**

To verify the equivalence of the two groups before implementing the educational intervention, an Independent-Samples t-test was used to compare their mean scores on the pre-test. The results showed no statistically significant difference between the experimental and control groups in the overall pre-test score, with a test value of $t = -0.290$, $p = .772$, which was not statistically significant at the $\alpha \leq 0.05$ level. Accordingly, the first null hypothesis (H01) was not rejected, indicating that the two groups were equivalent in their initial level of written translation skills prior to the implementation of the intervention.

*** Verification of Statistical Analysis Assumptions**

Before conducting the ANCOVA and MANCOVA analyses, the data were examined to ensure that the required statistical assumptions were met. The examination revealed no influential outliers and no substantial deviations from normality. Skewness values ranged from -0.61 to 0.48 , while kurtosis values ranged from -0.54 to 0.67 , all of which were within acceptable limits. Scatterplots also showed acceptable linear relationships between the pre-test and

post-test scores, supporting the assumption of linearity.

The homogeneity of variance between the two groups was also examined using Levene's test. For the overall post-test score, the test was not statistically significant, $F(1, 158) = 1.27$, $p = .262$, indicating that the assumption of homogeneity of variance was met. Similarly, Levene's tests for the sub-dimensions were not statistically significant, with $p = .318$ for semantic accuracy and meaning transfer, $p = .427$ for linguistic accuracy, $p = .291$ for stylistic and contextual appropriateness, and $p = .356$ for accuracy in the use of terminology and structures. All values were greater than the significance level of $.05$.

To verify the assumption of homogeneity of regression slopes for ANCOVA, the interaction between group and pre-test scores was examined. The interaction effect was not statistically significant, $F(1, 156) = 0.84$, $p = .361$, indicating that the relationship between the covariate and post-test scores was comparable across the two groups and supporting the assumption of homogeneity of regression slopes.

Regarding the assumptions of MANCOVA, the homogeneity of variance-covariance matrices

between the two groups was examined using Box's M test. The results indicated that the test was not statistically significant, Box's M = 13.42, $F = 1.29$, $p = .228$, suggesting no substantial violation of the assumption of homogeneity of variance-covariance matrices. Furthermore, the multivariate diagnostic tests revealed no substantial problems related to intercorrelations among the dependent variables or multicollinearity that could affect the validity of the analysis.

* Effect of Using ChatGPT on the Overall Level of Written Translation Skills

To investigate the effect of using ChatGPT on the overall level of written translation skills, Analysis of Covariance (ANCOVA) was used to compare the two groups' post-test scores after controlling for the effect of the pre-test scores as a covariate. Table (2) presents the results of the analysis.

Table (2). Results of ANCOVA for the Effect of Using ChatGPT on the Overall Score of Written Translation Skills

Source of Variance	Sum of Squares	df	Mean Square	F	p	η^2p
Pre-test	1352.48	1	1352.48	34.62	< .001	.181
Group	6938.27	1	6938.27	177.61	< .001	.531
Error	6132.19	157	39.06	—	—	—

The results showed a statistically significant effect of group on the overall post-test score after controlling for the effect of the pre-test, $F(1, 157) = 177.61$, $p < .001$, $\eta^2p = .531$. The partial eta squared value indicates a large effect size for the ChatGPT-based educational intervention.

To further clarify the direction of the differences between the two groups, the adjusted post-test means were calculated after controlling for the effect of the pre-test measurement, as shown in Table (3).

Table (3). Adjusted Post-test Means for the Overall Score of Written Translation Skills

Group	Raw Post-test Mean	Adjusted Mean	SE	95% CI
Experimental	82.73	82.81	0.70	[81.43, 84.19]
Control	69.46	69.38	0.70	[68.00, 70.76]

As shown in Table (3), the adjusted post-test mean for the experimental group was 82.81 (SE = 0.70, 95% CI [81.43, 84.19]), compared with 69.38 (SE = 0.70, 95% CI [68.00, 70.76]) for the control group. This result indicates that the group that received the ChatGPT-based intervention outperformed the control group in the

overall level of written translation skills after controlling for the effect of pre-test performance. Accordingly, the second null hypothesis (H02) was rejected.

* Effect of Using ChatGPT on the Dimensions of Written Translation Skills

To examine the effect of using ChatGPT on the sub-dimensions of written translation skills collectively, Multivariate Analysis of Covariance (MANCOVA) was conducted. The post-test scores of the four dimensions were entered as dependent variables, while their corresponding pre-test scores were controlled for as covariates. The results revealed a statistically significant multivariate effect of group on the combined dimensions of written translation skills, Wilks' $\Lambda = .392$, $F(4, 151) = 58.56$, $p < .001$, $\eta^2p = .608$, indicating a large effect of the ChatGPT-based educational intervention on multidimensional translation performance.

Given the statistical significance of the multivariate effect, follow-up univariate ANCOVA analyses were conducted separately for each dimension. The pre-test score of each respective dimension was used as a covariate when comparing the two groups on the post-test score of that dimension.

Adjusted post-test means, standard errors, and 95% confidence intervals were also calculated, as shown in Table (4).

Table (4). Adjusted Post-test Means and Follow-up ANCOVA Results for the Effect of Using ChatGPT on the Dimensions of Written Translation Skills

Dimension	Experimental: Adjusted Mean	SE	95% CI	Control: Adjusted Mean	SE	95% CI	F	p	η^2p
Semantic Accuracy and Meaning Transfer	25.16	0.31	[24.55, 25.77]	20.63	0.31	[20.02, 21.34]	89.34	< .001	.363
Linguistic Accuracy	20.95	0.28	[20.40, 21.50]	17.60	0.28	[17.05, 18.15]	71.82	< .001	.314
Stylistic and Contextual Appropriateness	20.51	0.29	[19.94, 21.08]	16.88	0.29	[16.31, 17.45]	78.16	< .001	.332
Accuracy in the Use of Terminology and Structure	16.26	0.22	[15.83, 16.69]	14.20	0.22	[13.77, 14.63]	42.57	< .001	.213

As shown in Table (4), there were statistically significant differences between the adjusted post-test means of the two groups across all dimensions of written translation skills in favor of the experimental group. For semantic accuracy and meaning transfer, the adjusted mean of the experimental group was $M_{adj} = 25.16$, compared with $M_{adj} = 20.63$ for the control group, indicating a statistically significant and practically large effect ($F = 89.34$, $p < .001$, $\eta^2p = .363$).

For linguistic accuracy, the adjusted mean of the experimental group was $M_{adj} = 20.95$, compared with $M_{adj} = 17.60$ for the control group, with a statistically significant difference ($F = 71.82$, $p < .001$, $\eta^2p = .314$). The experimental group also outperformed the control group in stylistic and contextual appropriateness, with an adjusted mean of $M_{adj} = 20.51$, compared with $M_{adj} = 16.88$ for the control

group, indicating a statistically significant effect ($F = 78.16, p < .001, \eta^2p = .332$).

For the accuracy in the use of terminology and structures dimension, the adjusted mean of the experimental group was $M_{adj} = 16.26$, compared with $M_{adj} = 14.20$ for the control group. The difference was statistically significant in favor of the experimental group ($F = 42.57, p < .001, \eta^2p = .213$), indicating that the intervention also contributed to the development of this dimension, although its effect size was smaller than those of the other dimensions.

A comparison of the effect sizes showed that semantic accuracy and meaning transfer had the largest effect size ($\eta^2p = .363$), followed by stylistic and contextual appropriateness ($\eta^2p = .332$), and then linguistic accuracy ($\eta^2p = .314$), while accuracy in the use of terminology and structures had the smallest effect size ($\eta^2p = .213$). These findings indicate that the effect of the ChatGPT-based educational intervention was not limited to the overall level of written translation skills but extended to all of their sub-dimensions. Accordingly, the third null hypothesis (H03) was rejected.

*** Summary of Hypothesis Testing Results**

The study results showed no statistically significant differences between the experimental and control groups in the pre-test measurement, supporting their equivalence prior to the implementation of the educational intervention. In contrast, the ANCOVA results revealed a statistically significant and practically large effect of using ChatGPT on the overall level of written translation skills after controlling for the effect of the pre-test measurement. The MANCOVA and subsequent univariate analyses also revealed a statistically significant effect of the intervention across all four dimensions of written translation skills, with varying effect sizes across the dimensions. The largest effect was observed for semantic accuracy and meaning transfer, while the smallest effect was found for accuracy in the use of terminology and structures. Overall, the findings indicate that the experimental group that learned using ChatGPT outperformed the control group that learned through the conventional method in post-test performance on written translation skills.

*** Discussion of the Results**

The study results showed that the use of ChatGPT within the educational intervention effectively contributed to developing the overall level of written translation skills among students in the experimental group compared with the control group. The difference between the two groups remained statistically significant after controlling for the effect of pre-test performance, while the large effect size revealed clear practical significance of the intervention in addition to its statistical significance. This result can be explained by the nature of the structured use of ChatGPT, which was not limited to obtaining ready-made translations but enabled students to analyze the source text, produce an initial translation, explore translation alternatives, compare and evaluate them, and then revise the text. Thus, ChatGPT became a supporting tool for the learning process and for practicing translation interactively. This result is consistent with studies demonstrating ChatGPT's ability to support core language skills among English language students (Al-Obaydi et al., 2025). It is also consistent with findings indicating its effectiveness in developing reading and writing skills among university-level English

language students (Alharbi, 2026). Furthermore, it is supported by findings demonstrating the effectiveness of ChatGPT-based strategies in improving English reading and writing skills through structured educational activities (Daza et al., 2024).

The analysis of the dimensions of written translation skills revealed that the effect of the intervention was not limited to overall performance but extended to all four dimensions, with the largest effect size observed in semantic accuracy and meaning transfer. This finding can be explained by the fact that interaction with ChatGPT enabled students to examine multiple formulations of the same meaning, compare translation alternatives, and explore the meanings of words and structures in light of the context before making the final decision. This may have contributed to shifting students' attention from searching for a direct equivalent for each word toward understanding the overall message of the text and preserving it in the target language. This result is consistent with findings from studies examining ChatGPT outputs in the context of translation student training, which demonstrated the tool's potential to support translation practices (Muftah, 2025). It also aligns with the use of

ChatGPT by English language learners in translation activities and their interaction with its outputs (Yovi et al., 2026). Furthermore, it is consistent with the use of ChatGPT and machine translation technologies in educational tasks based on text processing and reproduction (Xu & Wang, 2025).

The results also showed a large effect of the intervention on stylistic and contextual appropriateness, which ranked second in terms of effect size. This can be explained by the fact that comparing students' initial translations with alternative formulations provided by ChatGPT offered repeated opportunities to review the appropriateness of the language to the nature and context of the text and to recognize differences among possible formulations rather than focusing on linguistic correctness in isolation from context. Revising the translation after analyzing the alternatives may also have enhanced students' ability to produce a more coherent and contextually appropriate target text. This is consistent with evidence indicating ChatGPT's potential to support text revision and development in academic writing tasks (Yuan et al., 2024). It also aligns with findings regarding its effectiveness in enhancing

specialized English communication skills (Pondelíková & Luprichová, 2025). Furthermore, it is supported by findings demonstrating the potential of ChatGPT to enhance students' English communication skills through interaction and language practice (Wang, 2025).

Linguistic accuracy also showed a large effect size in favor of the experimental group, indicating that the use of ChatGPT within the processes of comparison, revision, and rewriting contributed to improving the linguistic accuracy of translated texts in terms of vocabulary, structures, and grammar. This result can be explained by the repeated exposure to multiple linguistic alternatives and their comparison with students' initial formulations, which provided greater opportunities for students to identify errors, reconsider their choices, and produce more accurate and coherent formulations. This finding is consistent with results demonstrating ChatGPT's contribution to developing core language skills among English language students (Al-Obaydi et al., 2025). It also aligns with evidence regarding its role in developing reading and writing skills (Alharbi, 2026). Furthermore, it is supported by studies highlighting the opportunities provided by the tool for

text revision and the improvement of written production (Yuan et al., 2024).

In contrast, the accuracy in the use of terminology and structures dimension recorded the smallest effect size among the four dimensions, although the effect of the intervention remained statistically significant and practically meaningful. This may indicate that developing terminological competence is more complex than improving general linguistic aspects, as selecting an accurate term does not depend solely on the availability of multiple linguistic alternatives but also requires specialized knowledge, a deep understanding of context, and the ability to distinguish subtle differences in usage. Therefore, ChatGPT's suggestion of a particular term or structure does not eliminate the need for students to evaluate its accuracy and contextual appropriateness. This interpretation is consistent with the literature showing that opportunities and challenges coexist when using ChatGPT in academic text production (Yuan et al., 2024). It also aligns with the emphasis on the quality of ChatGPT outputs and the need to evaluate them in the training of translation students (Muftah, 2025). This is further reinforced by studies

highlighting the importance of the nature of learners' interaction with ChatGPT and its outputs in translation activities (Yovi et al., 2026).

From a broader interpretive perspective, the improvement achieved by the experimental group should not be attributed to the use of ChatGPT independently of the educational structure of the intervention. The program involved intensive practice in comparison, analysis, revision, and rewriting, together with repeated engagement with translation alternatives and feedback. Therefore, the improvement may have resulted from the interaction between ChatGPT's capabilities and the nature of the structured educational activities through which these capabilities were employed. This interpretation is particularly important in light of the study's quasi-experimental design. The quasi-experimental design supports interpreting the differences in relation to the ChatGPT-based educational intervention, while taking into account the limitations associated with the use of intact classes and the absence of individual random assignment. Evidence from studies employing ChatGPT as a learning assistant indicates that its educational value can be enhanced

when students engage with the tool through guided learning, revision, and interaction rather than simply receiving generated outputs (Punar Özçelik & Yangın Ekşi, 2024). Similarly, ChatGPT-based didactic strategies have demonstrated positive outcomes when integrated into structured educational activities aimed at developing language skills (Daza et al., 2024). This is also consistent with the importance of directing patterns of ChatGPT use in language learning toward specific educational objectives (Ho, 2024).

Accordingly, the findings collectively indicate that the educational value of ChatGPT in translation education is largely associated with how it is integrated into the educational process rather than merely being made available to students. The intervention maintained the students' active role by requiring them to produce an initial translation independently, then use the tool for comparison and exploration, analyze alternatives, justify their choices, and revise the text. This means that the educational effectiveness of the tool becomes more evident when it functions as a mediator that supports translation thinking and critical evaluation rather than as a source that provides a final answer passively received by the

student. This interpretation is supported by research showing that ChatGPT can function as a learning assistant in developing students' writing skills through active engagement with generated feedback and revision (Punar Özçelik & Yangın Ekşi, 2024). It is also consistent with evidence that structured ChatGPT-based instructional strategies can contribute to the development of English reading and writing skills (Daza et al., 2024), as well as with the importance of directing English language learners' use of ChatGPT toward clearly defined educational purposes (Ho, 2024).

The findings provide an important pedagogical implication: ChatGPT can contribute to developing written translation skills when integrated into activities based on thinking, comparison, evaluation, revision, and decision-making, rather than when used as a substitute for the student translator. The effect sizes also showed that the impact of the intervention was not uniform across all components of translation performance. The largest effect was observed in semantic accuracy and meaning transfer, followed by stylistic and contextual appropriateness and then linguistic accuracy, while the effect was

relatively smaller for accuracy in the use of terminology and structures. This suggests that terminological skills may require additional support related to specialized knowledge, contextual understanding, and human judgment. Therefore, educational activities should clearly specify when students should use ChatGPT, the purpose of its use, and how they should analyze, verify, and evaluate its outputs before adopting them.

Nevertheless, the findings should be interpreted in light of the limitations of the study design and implementation context. The study was limited to students in English language departments at three Palestinian universities and to an educational intervention lasting eight weeks, while the assessment was restricted to translation from English into Arabic. In addition, the use of intact classes and the absence of individual random assignment limit the strength of causal inference compared with a randomized experimental design, despite verifying baseline equivalence and statistically controlling for pre-test performance. Therefore, generalizing the findings to other university contexts, different translation directions, other text types, and longer training periods requires further research. There is also a need

for studies employing more rigorous experimental designs, comparing ChatGPT with other artificial intelligence and machine translation tools, and using delayed follow-up tests to examine the sustainability of the intervention's effect on written translation skills.

*** Conclusions**

In light of the study findings and their discussion, the following conclusions can be drawn: -

- 1-The structured educational use of ChatGPT contributes to developing written translation skills among students in English language departments to a greater extent than conventional teaching methods.
- 2-The effectiveness of ChatGPT is not limited to facilitating the completion of translation tasks; it can also extend to developing students' own skills when used within activities based on analysis, comparison, revision, and rewriting.
- 3-The greatest effect of using ChatGPT was observed in semantic accuracy and meaning transfer, indicating its effectiveness in helping students understand context, compare alternatives, and select formulations that more accurately convey the intended meaning.
- 4-The use of ChatGPT contributed to improving linguistic accuracy and stylistic and contextual

appropriateness, reflecting the importance of feedback and the comparison of alternative formulations in improving the quality of translated texts.

5-A positive effect was observed in accuracy in the use of terminology and structures; however, the effect size was smaller than those observed for the other skills, suggesting that this aspect requires linguistic, contextual, and specialized knowledge that goes beyond relying solely on the tool's suggestions.

6-The educational value of ChatGPT largely depends on how it is employed. It is more effective when used as a supporting tool for translation thinking rather than as a substitute for students' own performance or as a means of obtaining ready-made translations.

7-The superior performance of the experimental group in the post-test, which was administered without the use of ChatGPT or machine translation tools, indicates the potential transfer of the training effect to students' independent written translation performance, although delayed follow-up assessments are needed to verify the sustainability of this effect.

8-The findings support the systematic integration of ChatGPT into written translation instruction in English

language departments, provided that students' critical role in analyzing and evaluating artificial intelligence outputs and making final translation decisions is maintained.

*** Recommendations**

In light of the findings and conclusions of the study, the following recommendations are proposed: -

1-Integrate ChatGPT systematically into written translation courses in English language departments through clearly defined educational activities that focus on developing students' skills rather than producing translations on their behalf.

2-Design translation activities in which students first produce an initial translation and then compare it with ChatGPT's suggestions, analyze the differences between them, and justify their choice of the final formulation, thereby enhancing critical thinking and translation decision-making.

3-Train students in English language departments to critically evaluate ChatGPT outputs and verify the semantic, linguistic, and stylistic accuracy of its suggestions before incorporating them into translated texts.

4-Develop training programs for faculty members and translation instructors on effective pedagogical approaches to integrating ChatGPT

and generative artificial intelligence tools into translation education.

5-Give greater attention to developing skills related to the use of terminology and structures when designing ChatGPT-based activities, given that this aspect requires contextual and specialized knowledge as well as a greater ability to evaluate the alternatives generated by the tool.

6-Develop clear academic policies and guidelines regulating the use of generative artificial intelligence tools in translation courses and defining acceptable educational uses in a manner that preserves students' independence and the integrity of the assessment process.

7-Conduct future studies comparing the effect of ChatGPT with other artificial intelligence and machine translation tools on the development of translation skills, while examining the effects of variables such as English language proficiency, text type, and prior experience with artificial intelligence tools.

8-Conduct longitudinal studies to examine the sustainability of the effects of ChatGPT-based training, the extent to which students retain the acquired translation skills, and their ability to apply these skills independently after the intervention period.

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