Shifting Roles: Employing AI-driven Translation Engines to Enhance the Writing Proficiency of EFL Learners

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Received: January 12, 2025 Accepted: March 19, 2025 Online Published: April 25, 2025

doi:10.5430/wjel.v15n6p11 URL: https://doi.org/10.5430/wjel.v15n6p11

Abstract

The simulation of human intelligence processes by computer software and internet MT engines has become apparent in education recently. Neural MT engines manipulate artificial intelligence to produce comprehensive results in translation. Thus, the regular role of such MT engines is prominent in translation among languages. Differently, the present study shifts the regular role of neural MT engines from translation to developing writing proficiency among EFL learners. A sample of EFL learners at Qassim University used neural MT engines that manipulate artificial intelligence to develop their writing proficiency during the academic year 2024. EFL learners' writings were evaluated through electronic proofreading software. Gains in writing skills like spelling, construction, concordance, and meaning are documented in the present study. The pre-post comparison of the writings of the study group had significant differences in favor of implementing artificial intelligence-based MT engines. The present study recommends implementing neural MT engines in writing classrooms to develop EFL learners' writing proficiency.

Keywords: Artificial Intelligence AI, Neural MT engines, proofreading software, writing proficiency

1. Introduction

Artificial intelligence has revolutionized various aspects of our lives, and one area where it has shown great potential is in the development of writing skills. According to Sharples (2022), AI technology is a powerful language model that becomes embedded through translators, summarizers, and chatbots. Artificial intelligence writing tools and assessors have emerged as new solutions to the challenges students face in improving their academic writing skills. This research paper aims to explore the practical implementation of AI-based translation engines in the teaching of academic writing in higher education, focusing on the teaching process, assessment, and the overall impact on students' writing skills.

Recent studies have investigated the impact of AI translation engines on international students in higher education. These tools have the potential to help students navigate academic writing tasks, offering personalized guidance and feedback that can help address common issues such as grammar, vocabulary, and organizational structure. Specifically, the use of AI-based instruction and feedback can have a profound impact on students' writing skills, as these technologies can identify and provide targeted recommendations to improve aspects such as coherence, clarity, and overall writing quality (Wang et al., 2023).

The integration of artificial intelligence into the teaching of academic writing is a growing area of interest as it promises to improve teaching and learning. AI writing tools can provide real-time feedback, personalized guidance, and intelligent assessment, allowing students to improve their writing skills more effectively. The use of artificial intelligence in the pedagogy of academic writing has the potential to change the way approach teaching and learning and presents both opportunities and challenges that require careful exploration.

In an increasingly globalized world, the ability to communicate effectively across languages is increasingly important. As the application of AI technologies in education continues to evolve, the potential of using AI-powered translation engines to improve writing skills is receiving considerable attention (Wang, 2023). One of the key benefits of using AI translation tools is their ability to provide real-time feedback and suggestions, allowing language learners to improve their writing and improve their overall proficiency. (Song & Song, 2023). Additionally, AI-powered translation engines have the potential to assist international students in higher education(Wang et al., 2023), helping them navigate academic writing tasks and offering personalized guidance to address common challenges such as grammar, vocabulary, and organizational structure. Studies have shown that AI-based translation engines can be effective tools for developing writing skills. Researchers have found that these technologies can provide language learners with real-time feedback and suggestions, enabling them to refine their writing and improve their overall proficiency (Jia et al., 2022; Pereira et al., 2023; Dong, 2023; Song & Song, 2023; BaHammam et al., 2023).

AI-based translation engines can be effective tools for developing writing skills. Researchers have found that these technologies can

provide language learners with real-time feedback and suggestions, enabling them to refine their writing and improve their overall proficiency (Smith, 2020; Godwin-Jones, 2022). Additionally, AI-powered translation engines have the potential to assist international students in higher education, helping them navigate academic writing tasks and offering personalized guidance to address common challenges such as grammar, vocabulary, and organizational structure. The integration of AI-based writing instruction and feedback can have a significant impact on students' writing skills, as these technologies are capable of identifying and providing targeted recommendations for improving coherence, clarity, and overall writing quality.

Existing literature has explored the theoretical underpinnings and potential benefits of incorporating artificial intelligence into writing instruction. However, more empirical research is needed to delve into the practical implementation and evaluation of AI-based pedagogy in academic writing classrooms.

2. Related Work

2.1 AI-Based Writing

Shidiq (2023) investigated the Chat GPT software and its impact on students' lack of creativity in writing competencies. Chat GPT, with its capability to offer solutions in keeping with the keywords entered by the user, can affect the arena of education and learning. But it's also essential to understand that not all of those facilities have a good impact on developing several student skills in learning, which include innovative writing skills. So, it is important to develop a method for instructors to use more than simply internet-based learning, which students can misuse in doing assignments. Concentrating on productivity, Noy and Zhang (2023) studied the influence of generative AI Chat GPT on writing. The experimental study indicated that Chat GPT substantially raised the writing productivity average. Also, there was a great decrease in writing time and a decrease in inequality among learners because of high productivity.

Most AI digital writing tools focus on the revision and modifying stages and few digital tools are developed to help users during the writing process, together with assisting users in formulating or translating their thoughts into writing. Consequently, Zhao (2023) studied Worddtune software. Wordtune is an AI-powered writing assistant that knows the author’s thoughts and suggests alternatives for rewriting them using different tones (informal & formal) and lengths (shorten & expand). Zhao (2023) concluded that this tool can help EFL writers keep a continuous flow and learn useful ways to express their ideas in written English.

AI has the potential to significantly enhance English language novices' communication competencies with the aid of supplying personalized and interactive learning experiences. However further research is wanted to explore the long-term effects and most effective integration of AI in language learning environments. In the end, (Rusmiyanto, et al., 2023) study highlights the transformative role of AI in English language education and its capability to deal with the diverse needs of language learners.

Chenchen Liu et al. (2023) investigated an AI-supported English writing approach through a quasi-experiment. The results indicated that the proposed AI writing approach has improved the sample group students’ English writing performance. Furthermore, the proposed AI approach improved the sample group students’ self-regulated learning and self-efficacy and there was a noticeable decrease in cognitive load.

Kim and Kim (2022) investigated the STEM education teachers’ perception of AI in scientific writing. Results showed that most teachers positively experienced AI in scientific writing. Furthermore, the study confirmed the need to change teachers’ roles in AI-based classrooms and the decision which become more transparent. Also, Chen (2023) used ChatGPT software in his study to develop scientific writing and overcome writer’s block. Chen (2023) mentioned that learners need to know how to exploit AI tools without having to understand the underlying algorithms.

Gayed et al. (2022) had a different vision for employing AI software in developing EFL learners’ writing skills. Instead of deploying AI software for revising and correcting writing, they developed an AI-based application for higher writing tasks that helped EFL learners reduce cognitive barriers. The AI- software was more structured and helpful than the traditional AI programs.

Huang et al. (2023) followed the bibliometric analysis to investigate 516 AI-based language teaching papers. According to this analysis, AI-based studies increased respectively from 2000 to 2019 and AI was followed to develop different language skills, Furthermore, AI was followed to develop automated writing evaluation and personalizing language learning. Schmidt and Strasser (2022) confirmed the self-directed manner of AI software. Digital media contributed to heterogenous EFL writing classrooms.

AlAfnan et al. (2023) examined Chat GPT as an educational tool for developing business writing. The study found that ChatGPT provided opportunities for learners to develop their English writing. However, the study revealed that ChatGPT may lead to unintelligence and unlearning since instructors may be unable to measure the students’ responses correctly and can’t differentiate between meticulous and automation-based learners.

Imran and Almusharaf (2023) investigated the previous AI-based studies to check the importance of the chatbot ChatGPT. Imran and Almusharaf concluded that ChatGPT has opportunities as well as challenges. For opportunities, it facilitates, and supports the academic writing process, while assessment tools should be revised for integrity and originality, like plagiarism criteria. Hence, Xu et al. (2023) developed a personalized AI-based feedback system. For Xu et al AI-based writing needs new feedback methods to enhance the writing process.

Kuniati and Fithriani (2022) studied the implementation of the AI Quillbot in the post-graduate academic writing classroom. Results

showed that Quillbot had three benefits: enhancing learners' attitudes toward writing, aiding learners in a friendly way, and developing learners' language.

2.2 AI-Driven Translation Engines for Developing Writing

Chung and Ahn (2022) studied the effect of manipulating MT for developing L2 writing proficiency. The study concentrated on developing the linguistic features where MT proved efficient. Chang and Ahn concluded their study with the need for more studies to investigate the effect of MT on other aspects of L2 writing. Lee (2020) investigated the usage of machine translation MT as a CALL tool in EFL writing classrooms. The study used MT translation to correct the samples' L2 writings. Thus, text analysis revealed that MT helped the sample students to decrease lexico-grammatical errors and had a positive effect on writing strategies.

Lee's (2023) metanalysis study on the studies conducted between 2000 and 2019 on machine translation engines, reported the enhancement and the importance of MT in developing FL writing. Lee's study showed that MT engines were used mainly in translating written texts and still MT engines have colloquial and discourse mistakes. Furthermore, the study showed that Google Translate has become the most widely used MT engine.

Tsai (2022) used Google Translate with a sample of EFL Chinese students. Tsai compared the samples' self-written English essays with the ones that are written in Chinese and translated by Google Translate. Results showed that the translated essays were significantly better and rich in vocabulary with fewer errors.

Deng and Yu (2022) conducted a metanalysis study of 26 MT-assisted language learning reviews. The study concentrated on the processes of integrating MT in language learning which are introduction, demonstration, assignment, and finally reflection. The study concluded with the need to update the integration of MT in language learning. Also, Dorst et al. (2022) mentioned that multilingual students use MT engines to look up new words in writing and they asserted the need for more MT literacy.

Kilimova et al. (2023) made s systematic review of foreign learning studies that were based on Neural Machine Translation (NMT). The review indicated that NMT tools are efficient in productive and receptive language skills as well as mediation skills that are relevant to translation. Moreover, the review showed that NMT tools are more helpful to advanced language learners than beginners or lower-intermediate learners.

Chon et al. (2021) conducted a study on 66 Korean EFL learners, that revealed MT narrowed the difference in writing ability between learners who are skilled and those less skilled. Also, there was a grammatical error reduction. As for Productivity Lglesias, O'Brien, and Cowan (2023) compared the traditional post-editing (TPE) with interactive post-editing (IPE) that are conducted by MT tools. The results were in Favor of IPE concerning productivity.

Hillmich (2021) tracked the real practices of novice language learners of MT in writing. Hillmich realized that MT may support or hinder foreign language writing i.e. awareness of MT tool limitations and appropriate use are supportive while inappropriate input and lack of analysis hinder foreign language writing.

Chon and Shin (2020) asked a sample of Korean EFL university students to write in three modes; direct writing, translated writing, and machine-translated writing. The results of the study showed that MT writing improved the samples' cohesion, and fluency and let the samples produce complex sentences with concrete words.

Tsai (2022) investigated using Google Translate as a CALL tool with EFL Chinese university students in writing Classes. The study compared the samples' self-written English essays to the ones written (SW) in Chinese and submitted to Google Translate (GT). Results showed that GT texts were better regarding advanced vocabulary, spelling and grammatical errors, and enriched content.

Ryu et al. (2022) examined the Korean perceptions of the guided use of the machine translation model and its impact on foreign language writing. The pre-post surveys and the samples' reflections indicated that the MT model is effective in developing the samples' confidence and fluency in foreign language writing.

3. Method

3.1 Experimental Setting

The research was carried out at Qassim University in Saudi Arabia and spanned four months, occurring in the first semester of the 2024 academic year. The study sample comprised thirty English as a Foreign Language (EFL) students who actively participated in the research.

3.2 Study Purposes

The present study seeks to fulfill the following objectives:

-Investigating the artificial intelligence-based written texts (AIWT) by EFL students in comparison with their self-written texts (SWT).

-Exploring the potential effectiveness of artificial intelligence-based written texts (AIWT) in developing EFL students' writing performance.

3.3 Participants

Thirty English major students from the Department of English Language and Translation at Uglat Asugour headquarters, Qassim

University were assigned to undertake the experiment. All the sample students were studying an advanced writing course in level three during the treatment. They studied the course for 10 weeks (3 hrs. per week) with artificial intelligence-based translation engines.

3.4 Data Collection Tools

3.4.1 Writing Proficiency Test

Test Description

For assessing the sample students' writing proficiency, the researcher used the electronic writing assessor Virtual Writing Tutor (https://virtualwritingtutor.com). The Virtual Writing Tutor is a free online essay checker and grammar check website. Following the Virtual Writing Tutor, the researcher assessed: (1) error density and (2) vocabulary proficiency.

Error density

The system checks common punctuation errors, common grammar mistakes and ESL grammar errors, false cognates, contextual spelling errors, and word choice errors. The system counts the number of different grammatical errors and gives a percentage of the grammatical errors.

Vocabulary Proficiency

The system analyzes vocabulary using a range of vocabulary checker tools. The system follows the CEFR (Common European Framework of Reference) to check the vocabulary level and proficiency. The system follows the CEFR levels that are: A1 (Beginner), A2 (Elementary), B1 (Intermediate), B2 (Upper-Intermediate), C1 (Advanced) and C2 (Proficient)

3.5 Design and Procedure

Paired-samples t-test was followed in the present study. Pre-post writing scores of the sample group students are compared. To assess the effect of the writing technique (artificial intelligence-based writing), the sample students sat for writing testing before and after the experiment during the academic year 2024. The pretest's main objective is to check the equality of entry-level for the sample students. After four months the sample students conducted the posttests.

3.6 Hypotheses

There is a statistically significant difference between the sample students' pre-post error density testing in favor of the post-testing.

There is a statistically significant difference between the sample students' pre-post vocabulary proficiency testing in favor of the post-testing.

4. Results

4.1 Hypothesis One

There is a statistically significant difference between the sample students' pre-post error density testing in favor of the post-testing.

To verify the validity of the first hypothesis a paired-sample t-test was used. Table (1) shows the significance of the difference between the mean scores of the participants in the pre-post error density testing.

Table 1. Significance of difference between the mean scores of the participants in the pre-post error density testing

Testing	Mean	Std. Deviation	df	t	Sig.
Pre-testing	6.9000	3.32545	29	6.753	0.001
Post-testing	2.8000				

The data presented in Table (1) reveals that "t" value is (6.753) and significant at 0.001, and "df" equals 29. This means managing neural MT engines in writing is effective in decreasing EFL students' errors. Through the proposals introduced by AI built-in such engines and the auto-error corrections, the sample students' writings contain limited structural, spelling, and contextual errors.

4.2 Hypothesis two

There is a statistically significant difference between the sample students' pre-post vocabulary proficiency testing in favor of the post-testing.

To verify the validity of this hypothesis a paired-sample t-test was used. Table (2) shows the significance of the difference between the mean scores of the participants in the pre-post vocabulary proficiency testing.

Table 2. Significance of difference between the mean scores of the participants in the pre-post vocabulary proficiency testing

Testing	Mean	Std. Deviation	df	t	Sig.
Pre-testing	2.4667	.80230	29	9.103	0.001
Post-testing	3.8000				

Table (2) reveals that "t" value is (9.103) and is significant at 0.001, and "df" equals 29. artificial intelligence-based written texts (AIWT) have more vocabulary proficiency. The sample students' AIWT were richer in vocabulary i.e. the students used more vocabulary related to higher CEFR (Common European Framework of Reference for Languages) levels. AIWT vocabulary ranged from B to C levels as reflected by Virtual Writing Tutor.

5. Discussion

The integration of AI translation engines into language learning and writing development has the potential to significantly enhance learners' writing skills and overall academic performance (Kong, 2022) (Wang, 2023) (Dong, 2023). As these technologies continue to evolve, it will be important for educators and researchers to explore the most effective ways to leverage AI-powered tools to support students' language learning and writing proficiency. (Song & Song, 2023; Rusmiyanto et al., 2023; Fontenelle-Tereshchuk, 2024).

Most AI-based writing studies used AI like Chat GPT to facilitate the EFL writing process i.e. to produce lengthy extracts (Shidiq, 2023; Noy & Zhang,2023). Others involved AI tools to produce error-free writings (Chenchen Liu et al. 2023; AlAfnan et al., 2023; Imran & Almusharaf,2023). Although AI-based writing proved to be efficient, researchers mention that a clear model is still needed to employ AI in EFL writing classrooms (Shidiq, 2023; Rumiyanto et al., 2023; Chen, 2023).

The studies that implement AI-based translation Engines in developing EFL writing concentrated mainly on linguistic features (Chung & Ahn, 2022; Lee, 2020; Lee,2023, Tsai, 2022). Other studies concentrated on translating first-language written texts into English to produce lengthy, comprehensive English writings (Tsai, 2022; Chon & Shin, 2020; Chon, et al., 2021).

The present study presents a different model for implementing AI-based machine translation for developing English writing among EFL learners. The sample of the present study was taught to use AI-based MT in the different writing stages. During the outlining stage, learners used MT to translate their ideas into English. While writing the first draft, learners followed MT to translate and complete their utterances. Finally, during the editing stage, learners revise their writings and get MT proposals.

AI-driven machine translation proved to be effective in the present study, regarding error density and vocabulary proficiency. Writing with the help of neural (AI) MT engines helped the sample students to remarkably decrease their linguistic errors. Furthermore, the sample students managed to use more proficient vocabulary i.e. their English writings became lengthier, and more vocabulary rated by CEFR.

6. Conclusion

In conclusion, the use of AI translation engines for developing writing skills holds significant promise. AI-driven MT engines helped the sample of the present study to decrease error density in their writings. Furthermore, AI-driven MT engines helped the sample students raise their vocabulary levels. Shifting AI-based MT engines from translation to writing helped EFL learners overcome writing barriers like vocabulary, construction, and creativity. By providing personalized feedback and guidance, these technologies can help language learners and international students improve their writing proficiency, ultimately enhancing their academic and professional success.

7. Recommendations

Based on the results of the study, the researcher proposes the following recommendations to improve EFL learners' writing proficiency:

- Manipulating MT neural engines in EFL writing classroom

  Teachers can employ MT neural engines in writing classrooms to help students write lengthy, rich, and correct English writings.

- Enhancing writing attitudes

  Modeling AI-driven translation engines to produce personalized, creative writing will develop language learners' attitudes toward writing.

- Implementing AI assessors

  Teachers can implement AI assessors in writing classrooms since they produce immediate feedback and develop language learners' vocabulary.

8. Limitations and Future Scope

The present study is limited to university-stage EFL majors. Furthermore, only a sample of thirty English language and translation students participated in the study. As for study duration, the study lasted for one academic semester (3 months). Finally, the present study was limited to shifting MT neural engines to develop writing proficiency, hence other AI-based software can be examined to develop writing proficiency.

Acknowledgments

The Researcher would like to thank the Deanship of Graduate Studies and Scientific Research at Qassim University for financial support (QU-APC-2025).

Authors' contributions

Assoc. Prof. Ayman Mohamed El-Esery was responsible for the entire study.

Funding

Not applicable.

Competing interests

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Sciedu Press.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

Open access

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