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How Machine Translation Affects Students' Ability in Writing English Texts

Andi Nuzul Hikmah Buana[1], Puji Rahmah[2], Ahmad Akbar[2]
[1,2,3]Universitas Lamappapoleonro
*Correspondence: andinuzul@unipol.ac.id

Abstract: This study investigates the impact of machine translation (MT) on the English writing ability of fourth-semester Informatics Engineering students at Universitas Lamappapoleonro (UNIPOL). The study addresses the growing concern over students' reliance on MT tools in academic writing and aims to determine whether these technologies support or hinder language development. A mixed-method approach was employed, combining quantitative analysis through pre-tests and post-tests with qualitative insights from semi-structured interviews. The findings indicate that MT can improve students' grammatical accuracy, vocabulary range, and writing fluency by providing linguistic scaffolding and examples of correct language use. However, excessive dependence on MT may limit learners' creativity and ability to apply grammatical rules independently. The results suggest that MT is most effective when used as a supplementary aid under proper instructional guidance. The study concludes that integrating MT into English learning for non-language majors can enhance both linguistic competence and digital literacy, provided that students are trained to use the technology critically and responsibly.

Keywords: Machine Translation; English Writing; Digital Literacy

A. Introduction

The integration of technology into language education has transformed how students learn and communicate in English as a foreign language (EFL). Among the most widely used tools is machine translation (MT), such as Google Translate and DeepL, which provide quick and accessible translation across languages. These tools have become essential aids for many EFL learners, especially when completing writing assignments or understanding complex texts (Garcia & Pena, 2011; Groves & Mundt, 2015). However, while MT tools can help students improve lexical and grammatical accuracy, their influence on learners' actual writing competence remains controversial.

Writing in a second language requires cognitive and linguistic skills, including vocabulary mastery, grammar awareness, and the ability to organize ideas coherently. Excessive dependence on MT may reduce students' engagement in these processes, resulting in limited development of independent writing ability (Bahri & Mahadi, 2016). Conversely, when used critically, MT can

serve as a supportive learning tool, enabling students to analyze linguistic patterns, gain new vocabulary, and refine their written output (Nurminen & Koponen, 2020).

Previous research by Buana, Dalle, and Baso (2019) highlighted that translation activities play a crucial role in enhancing students' linguistic awareness and understanding of language structures. Their findings suggest that translation—whether human or machine-assisted—can bridge the gap between comprehension and production in English learning. Therefore, understanding how students utilize machine translation in their writing process becomes essential in determining whether it supports or hinders their linguistic development.

This study aims to investigate how the use of machine translation affects students' ability to write English texts. It seeks to explore whether MT assists or hinders the writing process, and to what extent it impacts students' language accuracy, fluency, and overall composition quality. The findings are expected to provide valuable insights for teachers and curriculum developers regarding the pedagogical integration of MT in EFL writing instruction.

B. Materials and Methods

Research Design

This study employed a quantitative descriptive design with a quasi-experimental approach to examine the impact of machine translation (MT) use on students' English writing ability. Two groups of students were involved: one using MT tools during writing tasks (experimental group) and another writing without MT assistance (control group). Both groups were given pre-tests and post-tests to measure improvement in writing performance.

Participants

The participants of this study were 40 fourth-semester students from the Informatics Engineering Department, Universitas Lamappapoleonro (UNIPOL), Indonesia. The participants were selected through purposive sampling, ensuring that they had completed at least one English course related to writing or communication. All participants voluntarily took part in the study and provided informed consent prior to data collection.

Instruments and Materials

The instruments and materials used in this research included the following:

1. Writing Test – Students were asked to write a 250-word descriptive text in English based on a given topic.
2. Machine Translation Tools – The experimental group was permitted to use Google Translate and DeepL Translator during the writing activity.
3. Writing Rubric – An analytic scoring rubric adapted from Jacobs et al. (1981) was used to assess five aspects: content, organization, vocabulary, language use, and mechanics.
4. Questionnaire – A five-point Likert-scale questionnaire was administered to gather data about students' perceptions, frequency of MT use, and attitudes toward MT in writing.
5. Interview Guide – Semi-structured interviews were conducted with selected participants to gain deeper insights into their experiences and perspectives on using MT in English writing.

All research materials, including the questionnaire, rubric, and interview guide, are available from the corresponding author upon reasonable request.

Procedures

The research was conducted over four weeks during the second semester of the 2024–2025 academic year. The steps were as follows:

1. Week 1: Pre-test administered to all participants without the use of MT tools.
2. Weeks 2–3: Writing instruction and practice sessions. The experimental group received guidance on how to use MT critically and responsibly, while the control group practiced writing without MT support.
3. Week 4: Post-test conducted, with the experimental group allowed to use MT tools during the task.

All essays were evaluated by two independent raters to ensure inter-rater reliability (Cohen's Kappa = 0.84). Quantitative data were analyzed statistically to compare the writing performance between groups.

Data Analysis

Data were analyzed using SPSS version 25. Descriptive statistics (mean and standard deviation) were used to summarize the data. An independent samples t-test was applied to identify any significant differences between the control and experimental groups' writing scores. In addition, qualitative data from the interviews were analyzed thematically to complement the quantitative findings.

Data Availability

All datasets generated and analyzed during this study are available from the corresponding author upon reasonable request. There are no restrictions on the availability of anonymized data or related research materials.

C. Result and Discussion

1. Improvement in Students' Writing Performance

The quantitative analysis showed that the use of machine translation (MT) tools had a noticeable impact on the students' English writing performance. Based on the pre-test and post-test results, the experimental group (who used Google Translate and DeepL) demonstrated an average improvement of 15.6 points**,** while the control group (who did not use MT) improved by 8.2 points. Statistical analysis using an independent samples *t*-test revealed a significant difference between the two groups ($p < 0.05$), indicating that MT use contributed positively to writing improvement in terms of grammar accuracy and vocabulary richness.

These findings align with previous research by Garcia and Pena (2011) and Bahri and Mahadi (2016), which also found that MT can function as an effective language learning aid when used critically. In this study, students reported that MT helped them verify sentence structures, correct grammatical errors, and enhance their lexical choices during the writing process.

2. Students' Perceptions of Machine Translation

Data from the questionnaire and interviews indicated that most students viewed MT tools as useful and efficient resources for English writing. Approximately 80% of respondents agreed that MT made the writing process easier and faster, while 65% stated that it helped them learn new vocabulary. However, several participants expressed concerns about overreliance on MT and inaccuracy in meaning, especially in translating idiomatic or technical expressions.

These perceptions are consistent with the findings of Groves and Mundt (2015**)**, who emphasized that while MT facilitates writing, it may also limit learners' independent language construction. Similarly, Buana, Dalle, and Baso (2019) observed that translation activities—whether human or automated—can improve linguistic awareness but should be balanced with active language production to strengthen comprehension and writing skills.

3. Qualitative Observations

Qualitative analysis from interviews supported the quantitative results. Students who used MT effectively tended to cross-check and revise the translated text rather than copying it directly. These students demonstrated better cohesion, organization, and vocabulary accuracy in their essays compared to those who used MT passively. On the contrary, students who relied too heavily on MT showed limited progress in syntactic variety and critical language awareness.

This suggests that the effectiveness of MT in writing improvement depends largely on how strategically it is used**.** When learners engage in self-correction, reflection, and comparison between MT output and their own writing, they gain deeper linguistic insight. This finding supports Nurminen and Koponen (2020), who argued that MT use in education is most effective when guided by pedagogical frameworks that encourage critical engagement.

4. Implications of the Findings

The results of this study indicate that machine translation (MT) can be a supportive learning tool in developing English writing ability, especially for non-English major students such as those in Informatics Engineering. The tools provide scaffolding that helps students overcome linguistic barriers while writing technical or descriptive texts. However, educators should guide students in using MT responsibly and selectively, ensuring that the tool complements rather than replaces language learning.

From a broader perspective, integrating MT into the classroom can enhance digital literacy and language awareness, two competencies essential in higher education and the global workforce. This integration also aligns with the growing influence of Artificial Intelligence (AI) in educational settings, which calls for a redefinition of teacher roles and pedagogical practices in the digital era (Asnawan, Buana, & Hignasari, 2025). As AI-driven tools become more embedded in academic environments, educators are encouraged to adapt their teaching strategies to balance technological assistance with critical human engagement in language learning

5. Future Research Directions

Future studies could expand this research by including larger samples, different academic disciplines, and longitudinal designs to observe how MT use influences writing skills over time. Researchers may also analyze specific linguistic aspects—such as coherence, fluency, and critical thinking—to determine which areas benefit most from MT integration. Furthermore, exploring the use of AI-based grammar checkers and context-aware MT tools could provide new insights into how advanced technologies shape language learning.

D. Conclusion

This study investigated the impact of machine translation (MT) tools on the English writing ability of fourth-semester Informatics Engineering students at Universitas Lamappapoleonro (UNIPOL). The results revealed that MT can serve as a supportive tool in enhancing students' grammatical accuracy, vocabulary use, and confidence in writing. However, its effectiveness depends largely on how critically and responsibly it is used.

While MT provides linguistic scaffolding that helps non-English major students

overcome language barriers, excessive reliance may hinder the development of independent writing competence. Therefore, educators should provide explicit guidance to ensure that MT functions as a complement to, rather than a substitute for, language learning.

Furthermore, the integration of MT and other AI-based language technologies reflects a broader pedagogical transformation in higher education. As highlighted by Asnawan, Buana, and Hignasari (2025), teachers must adapt their competencies and instructional approaches to align with the ethical and pedagogical challenges of the generative AI era. Future research may expand this study by exploring long-term effects of MT use and by comparing its impact across different academic disciplines

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