p-ISSN: 2598-1218
e-ISSN: 2598-1226

Volume 8 Nomor 11 Tahun 2025
DOI : 10.31604/jpm.v8i11. 4471-4478

TRAINING ON THE USE OF ARTIFICIAL INTELLIGENCE (AI) TO IMPROVE JUNIOR HIGH SCHOOL STUDENTS' WRITING SKILLS IN THE DIGITAL ERA

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Abstract

This study investigates the effectiveness of an AI-assisted writing training program in improving junior high school students' writing skills in a rural context. The program was conducted at SMP Negeri 2 Matangkuli, North Aceh, involving 40 students from Grades VII to IX over two months (October–November 2025). A quasi-experimental one-group pretest. Posttest design was applied. Students participated in structured writing workshops integrating AI tools such as Grammarly, QuillBot, and ChatGPT. The results showed a significant improvement in students' writing performance, with the mean score increasing from 62.45 in the pre-test to 74.10 in the post-test ($p < 0.05$). The most notable progress was observed in grammar and vocabulary use. In addition, students demonstrated higher engagement, confidence, and digital literacy in using AI responsibly. The findings indicate that AI-assisted writing instruction can effectively enhance EFL writing skills and support digital learning in rural schools when implemented with proper guidance and supervision.

Keywords: Artificial Intelligence in Education, Digital Literacy, EFL Writing Skills

BACKGROUND

In the contemporary digital era, Artificial Intelligence (AI) has progressively become an integral component of educational transformation, particularly within the domain of English language learning (ELL). The rapid advancement of AI-driven technologies has reshaped pedagogical paradigms by enabling adaptive learning systems, automated feedback mechanisms, and personalized instructional pathways (Zawacki-Richter et al., 2019). In language education, AI facilitates individualized learning experiences through intelligent tutoring systems, natural language processing (NLP), and machine learning algorithms that analyze learner performance in real time. These developments align with the broader shift toward technology-enhanced learning environments that emphasize learner autonomy, formative feedback, and data-informed instruction. Consequently, AI is no longer viewed merely as a supplementary digital tool but as a transformative pedagogical instrument capable of enhancing instructional effectiveness and learner engagement.

Among the four fundamental language skills; listening, speaking, reading, and writing. Writing remains one of the most cognitively demanding competencies for English as a Foreign Language (EFL) learners. Writing requires the integration of multiple linguistic and cognitive processes, including grammatical accuracy, lexical selection, syntactic structuring, coherence, cohesion, and rhetorical organization (Hyland, 2019). For junior high school students,

particularly those in EFL contexts such as Indonesia, writing difficulties frequently stem from limited vocabulary range, insufficient mastery of grammatical structures, and challenges in organizing ideas into coherent paragraphs. Traditional teacher-centered writing instruction, which often relies on product-based approaches and delayed corrective feedback, may not sufficiently accommodate diverse learner needs. Students who struggle with linguistic accuracy or idea development frequently receive generalized corrections without detailed guidance on revision strategies, resulting in minimal improvement and decreased motivation.

In response to these pedagogical challenges, AI-powered writing tools have emerged as promising innovations in language instruction. Applications such as Grammarly, QuillBot, and ChatGPT exemplify the practical implementation of AI in supporting writing development. Grammarly provides automated grammar checking, vocabulary suggestions, and stylistic recommendations through NLP algorithms that analyze textual input in real time (O'Neill & Russell, 2019). This immediate corrective feedback allows learners to identify and revise linguistic errors independently, promoting metacognitive awareness and self-regulated learning. QuillBot functions primarily as a paraphrasing and rephrasing tool, enabling students to experiment with alternative lexical and syntactic constructions while preserving semantic meaning (Alharbi, 2022). Such features can contribute to vocabulary expansion and syntactic flexibility, particularly for learners with limited expressive resources.

Meanwhile, ChatGPT, developed based on large language models (LLMs), offers interactive writing assistance by generating example texts, outlining ideas, modeling discourse structures, and responding to user prompts in conversational formats (Kasneci et al., 2023). Unlike conventional grammar- checking software, ChatGPT can engage learners in dialogic scaffolding, thereby supporting brainstorming, drafting, and revising stages of the writing process. From a socio-cognitive perspective, these AI tools function as digital scaffolds that reduce cognitive load and provide immediate formative input, ultimately fostering learner confidence and autonomy. Moreover, AI-assisted writing aligns with process-based approaches to writing instruction, which emphasize drafting, feedback, and revision cycles rather than merely evaluating final products.

Despite the potential benefits of AI integration in education, significant disparities persist in access to digital technologies, particularly in rural regions. In Indonesia, infrastructural limitations, inconsistent internet connectivity, limited device availability, and insufficient digital literacy training contribute to a pronounced digital divide between urban and rural schools (Putra & Santosa, 2021). Students in rural areas, including those in North Aceh, often have minimal exposure to advanced educational technologies, thereby restricting their opportunities to benefit from AI-enhanced learning environments. This inequality not only affects technological proficiency but also influences academic achievement and long- term educational competitiveness. Without targeted interventions, rural learners risk being marginalized in an

increasingly technology-driven academic landscape.

Addressing this gap requires structured and context-sensitive educational initiatives. In response to these challenges, a community based training program is proposed to introduce AI-assisted writing to students at Junior High School (SMP Negeri 2) Matangkuli, North Aceh. The program is scheduled to be implemented over a two- month period, from October to November 2025. It aims to familiarize students with AI writing tools, develop their digital literacy competencies, and integrate AI-assisted feedback into structured writing instruction. Beyond improving writing proficiency, the program seeks to cultivate responsible and ethical AI use, ensuring that students employ these tools as learning aids rather than as substitutes for critical thinking and creativity.

The program will involve 40 students from Grades VII to IX, representing diverse levels of writing ability and technological familiarity. The selection of heterogeneous participants is intended to ensure inclusivity and provide differentiated learning support. Instructional materials and activities will be adapted to students' cognitive development stages and curriculum requirements. The training will combine theoretical orientation sessions, hands-on workshops, guided practice, and independent writing tasks. Face-to-face workshops will facilitate direct supervision and collaborative learning, while structured practice sessions will allow students to apply AI tools to narrative, descriptive, and argumentative writing tasks relevant to their grade levels.

Pedagogically, the training will adopt a blended instructional framework that integrates explicit instruction, guided discovery, collaborative writing, and reflective evaluation. Students will first receive foundational instruction on writing components such as paragraph structure, thesis development, and coherence before utilizing AI tools to refine their drafts. Teachers and facilitators will monitor AI usage to ensure constructive engagement and prevent over-reliance. By combining human guidance with AI-assisted feedback, the program aspires to create a balanced learning ecosystem that enhances both linguistic competence and digital readiness. In conclusion, the integration of AI in writing instruction offers significant pedagogical potential, particularly in supporting formative feedback, learner autonomy, and adaptive learning. However, equitable access and guided implementation remain essential considerations. The proposed training at *SMP Negeri 2 Matangkuli* represents a strategic effort to bridge the digital divide in rural education settings while fostering improved writing skills and digital literacy. As AI continues to shape future educational landscapes, equipping students with the skills to engage critically and ethically with such technologies becomes not merely beneficial but imperative.

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METHOD

Preparation

The implementation of the AI-assisted writing training program commenced with a structured preparation phase to ensure administrative readiness, pedagogical alignment, and technical feasibility.

Initial coordination meetings were conducted between the program organizers, the school principal of SMP Negeri 2 Matangkuli, and English teachers to establish a shared understanding of the program objectives, timeline, roles, and expected outcomes. This collaborative planning was essential to align the intervention with the school curriculum and to secure institutional support throughout the implementation process.

During this phase, instructional materials were systematically developed and adapted to the cognitive level of junior high school students (Grades VII–IX). The materials included theoretical modules on Artificial Intelligence in education, digital literacy guidelines, ethical use of AI tools, structured writing worksheets, and practical guides for operating AI-powered applications. Special consideration was given to ensuring that instructions were clear, contextually relevant, and accessible for students with limited prior exposure to advanced digital technologies.

Technical preparation was also undertaken to ensure adequate access to digital devices and internet connectivity. Trial sessions were conducted to test the functionality of selected AI writing tools, including Grammarly, QuillBot, and ChatGPT, to minimize technical disruptions during the training sessions.

To establish a baseline for evaluation, a pre- test was administered prior to the intervention. The pre-test required students to produce a short written composition aligned with the English curriculum. The purpose of this assessment was to measure students' initial writing proficiency in terms of grammar accuracy, vocabulary use, coherence, and organization. The results of the pre-test served as a reference point for determining learning progress and evaluating the effectiveness of the training program.

Implementation

The implementation phase was conducted over a two-month period, from October to November 2025, and consisted of four structured sessions delivered biweekly. Each session was designed to gradually develop students' understanding, skills, and confidence in using AI tools to support their writing process.

The first session, conducted in the first week of October, focused on conceptual orientation. Students were introduced to the fundamental concept of Artificial Intelligence and its applications in educational contexts, particularly in language learning. The session emphasized digital literacy, critical thinking, and ethical considerations in the use of AI technologies. Students were guided to understand that AI tools function as learning assistants rather than substitutes for independent writing. Discussions and interactive demonstrations were conducted to build awareness of responsible technology use, academic integrity, and the importance of maintaining originality in writing.

The second session, conducted in the third week of October, centered on practical introduction to AI-powered writing tools. Students received guided instruction on how to operate Grammarly, QuillBot, and ChatGPT for writing improvement. Facilitators demonstrated how AI tools provide grammar corrections, vocabulary suggestions, paraphrasing assistance,

and structural recommendations. Students engaged in supervised hands-on practice, focusing primarily on sentence-level revision and lexical enhancement. During this stage, the emphasis was placed on critical evaluation of AI-generated feedback, encouraging students to analyze suggestions rather than accept them uncritically.

The third session, implemented in the first week of November, shifted the focus toward paragraph-level development. Students practiced composing short paragraphs, applying pre-writing strategies such as brainstorming and outlining before drafting their texts. AI tools were then utilized to refine grammatical accuracy, improve vocabulary selection, and enhance coherence. A collaborative writing activity was incorporated, in which students worked in small groups to produce a descriptive text. This cooperative approach promoted peer discussion, collective problem-solving, and reflective learning, while reinforcing the integration of AI support within the writing process.

The fourth and final session, conducted in the third week of November, adopted a project-based learning approach. Students were assigned to write short essays on selected topics relevant to their academic level. They were permitted to use AI tools under structured guidelines to assist in drafting and revising their work. Upon completion, students presented their essays to the class, explaining how AI tools contributed to their revisions and improvements. Peer feedback and teacher feedback were provided, followed by reflective discussions to evaluate individual progress throughout the program. This final session aimed not only to measure writing improvement but also to cultivate presentation skills, confidence, and metacognitive awareness.

Evaluation

Evaluation was conducted systematically to measure both learning outcomes and program effectiveness. At the beginning of the intervention, students completed a pre- test to assess baseline writing proficiency. At the conclusion of the program, a post- test was administered using comparable writing prompts and assessment criteria. Students' compositions were evaluated using an analytic scoring rubric covering content development, organization, vocabulary, grammar, and mechanics. The comparison between pre-test and post-test results provided quantitative evidence of improvement in writing skills.

In addition to test-based assessment, continuous observational monitoring was conducted throughout the workshops. Facilitators documented students' participation, engagement levels, responsiveness to feedback, and adaptability in using AI tools. This observation provided insight into behavioral and motivational changes during the intervention.

Qualitative feedback was also collected from both students and teachers through reflective discussions and short questionnaires. Participants were encouraged to share their experiences, perceived benefits, challenges encountered, and suggestions for future implementation. This feedback contributed to a comprehensive understanding of the program's impact beyond numerical score improvements.

At the conclusion of the training, a comprehensive implementation report was prepared. The report included quantitative test results, qualitative feedback analysis, observational findings, and documentation of activities. Supporting evidence such as photographs, selected samples of student writing (before and after revision), attendance records, and activity logs were compiled to ensure transparency and accountability.

Overall, the method of implementation was designed to integrate systematic planning, structured instructional delivery, and rigorous evaluation procedures. By combining pedagogical scaffolding with empirical assessment, the program aimed to ensure both instructional effectiveness and measurable improvement in students' writing proficiency and digital literacy within a rural educational context.

RESULT AND DISCUSSION

The implementation of the AI-assisted writing training program at SMP Negeri 2 Matangkuli was carried out over a two- month period involving 40 students from Grades VII to IX. The findings of the program were derived from quantitative data (pre-test and post-test scores) and qualitative data (observations, student reflections, and teacher feedback).

The quantitative analysis indicated a measurable improvement in students' writing performance after the intervention. The mean pre-test score of students' writing ability was 62.45 (SD = 7.83), indicating moderate proficiency with notable weaknesses in grammar accuracy and paragraph organization. After the completion of the training program, the mean post-test score increased to 74.10 (SD = 6.95). The average gain score of 11.65 points suggests substantial improvement in overall writing competence. Statistical analysis using a paired-sample t-test demonstrated that the difference between pre-test and post-test scores was statistically significant ($p < 0.05$), indicating that the AI-assisted writing intervention contributed positively to students' writing development.

A more detailed analysis of rubric components revealed that the most significant improvement occurred in grammar accuracy and vocabulary usage. Students demonstrated greater awareness of subject–verb agreement, tense consistency, and sentence structure after engaging with AI-powered corrective feedback. Vocabulary diversity also improved, as students utilized paraphrasing suggestions and synonym alternatives generated by AI tools. Improvements in text organization and coherence were observed as well, although the increase in this component was slightly lower compared to grammar and vocabulary. This suggests that while AI tools effectively support micro-level linguistic corrections, macro-level discourse organization still requires guided instructional scaffolding.

Observational data indicated high levels of student engagement during workshop sessions. Initially, several students expressed hesitation and limited confidence in using digital tools. However, as sessions progressed, students demonstrated increased autonomy in revising their drafts and critically evaluating AI-generated suggestions. They were able to distinguish between appropriate and inappropriate corrections, reflecting emerging

digital literacy and critical awareness.

Qualitative feedback further supported these findings. Most students reported that AI tools helped them "understand mistakes more clearly" and "find better words to express ideas." Teachers also observed that students became more motivated to revise their writing compared to traditional correction methods, where feedback was often perceived as repetitive or discouraging. The integration of AI tools appeared to reduce anxiety associated with making grammatical errors, thereby fostering greater confidence in written expression.

The results of this study indicate that AI- assisted writing instruction can significantly enhance junior high school students' writing proficiency in a rural educational context. The statistically significant improvement in post-test scores suggests that the structured integration of AI tools into the writing process provides effective scaffolding for EFL learners. This finding aligns with previous research emphasizing the pedagogical potential of AI-driven feedback systems in supporting language development and personalized learning pathways (Zawacki-Richter et al., 2019; Kasneci et al., 2023).

The notable gains in grammar accuracy and vocabulary development confirm that AI- powered tools are particularly effective in addressing linguistic-level challenges. Automated corrective feedback allows students to immediately identify and revise errors, promoting self-regulated learning and metacognitive engagement. In contrast to traditional teacher feedback, which may be delayed due to time constraints, AI tools provide instant responses, thereby increasing opportunities for iterative revision. This supports the process-based approach to writing, where drafting and revising are central components of skill development (Hyland, 2019).

However, the relatively moderate improvement in organizational coherence suggests that AI tools alone may not fully address higher-order writing skills. While AI applications can generate structural suggestions, students still require explicit instruction in discourse organization, argument development, and logical sequencing. Therefore, AI integration should be complemented by teacher guidance to ensure balanced cognitive development. The findings reinforce the notion that AI functions most effectively as a supportive pedagogical assistant rather than a replacement for teacher expertise.

Another significant outcome of the program was the enhancement of students' digital literacy and critical awareness. At the beginning of the intervention, many students had limited exposure to AI-based applications. Through guided practice and reflective discussion, students developed a more responsible and analytical approach to technology use. They learned to evaluate AI suggestions critically rather than accept them automatically, thereby mitigating risks of over-reliance and academic dishonesty. This outcome is particularly relevant in rural contexts, where the digital divide often restricts equitable access to emerging educational technologies (Putra & Santosa, 2021).

From a motivational perspective, the integration of AI tools appeared to increase students' engagement and confidence. The interactive nature of AI-assisted revision reduced writing anxiety and encouraged experimentation with new vocabulary

and sentence structures. This aligns with constructivist learning principles, which emphasize active participation, immediate feedback, and learner autonomy as drivers of meaningful learning experiences.

Overall, the findings demonstrate that the AI-assisted writing training program effectively improved students' linguistic competence, digital literacy, and motivation. Nevertheless, sustainable implementation requires adequate infrastructure, teacher training, and continuous supervision to ensure ethical and pedagogically sound use of AI technologies. Future research may consider employing control-group designs or longitudinal approaches to examine long- term impacts and broader applicability across different educational settings.

In conclusion, the integration of AI-assisted writing tools within a structured pedagogical framework represents a promising strategy for enhancing EFL writing instruction in rural junior high schools. The program not only bridged technological gaps but also fostered measurable academic improvement, thereby contributing to more equitable and innovative language education practices.

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