

Impact of AI-Enhanced Reflective Journals on Metacognitive Awareness in Writing Skills

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In the present era of education 4.0, the inclusion of technology, particularly artificial intelligence (AI), has brought about a significant advancement in ESL teaching-learning processes. It facilitates the enhancement of productive skills of learners like speaking and writing through self-regulated learning. Thus, this study investigates the effectiveness of AI-assisted reflective journals in promoting metacognitive L2 writing skills of second-year Arts students in a state university in Sri Lanka. Metacognitive skills in writing are cognitive processes that involve planning, monitoring, evaluating, revising and reflecting on one's work while reflective journals are the personal records of analyses and reflections of their thoughts, experiences and learning processes. Thirty students were instructed to save their writing samples of reflective journals before and after employing AI-assisted grammar checks, with corresponding dates in a Google document. They utilized ChatGPT, Gemini and QuillBot for six weeks to self-evaluate their reflective journals. These tools provided corrective feedback, facilitating the students to improve their writing skills. This approach allowed the researcher to assess their progress in writing abilities. Data were collected through pretests and posttests to quantitatively evaluate the improvement in writing skills, and semi-structured interviews to gain the participants' qualitative insights into their experience and perceptions. Informed consent was obtained from all the participants before the commencement of the study. The findings indicate that AI-enhanced reflective writing shows promise in developing metacognitive writing skills of L2 learners. Posttest scores revealed significant improvements in vocabulary, grammar and overall writing proficiency compared to pretest results. A t-test result of $t(29) = -6.074$, $p < 0.001$ proved this. The detailed feedback provided by AI tools motivated autonomous learning, assisting students with identifying their errors and mistakes and correcting them effectively. Thematic analysis of the semi-structured interview highlighted that the confidence level, reflective practices and writing strategies of the students were remarkably improved. They further reported that the constructive feedback of the AI tools and the reflective writing deepened their engagement with the writing process. They stated that they could observe advancement in their writing strategies in organizing ideas and revising which contributed to their overall proficiency. Therefore, the integration of AI into reflective writing practices serves as an innovative approach to promoting metacognitive writing skills. This study adds to the growing body of literature on the role of AI in education, especially on the development of L2 writing skills. The findings have important implications for ELT practitioners, instructional designers and policymakers seeking to incorporate AI applications to foster metacognitive skills and improve writing instruction. This research also spotlights the evolving potential of AI in education, facilitating academic and professional success in a digital era.

Keywords: *artificial intelligence, L2 writing skills, metacognitive awareness, personalized feedback, reflective journals*

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