ARTIFICIAL INTELLIGENCE IN ACADEMIC WRITING INSTRUCTION: OPPORTUNITIES, CHALLENGES, AND FUTURE DIRECTIONS

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ABSTRACT

The rapid diffusion of artificial intelligence (AI), particularly generative AI tools such as ChatGPT and automated writing-evaluation systems, has reshaped how academic writing is taught, practised, and assessed in higher education. This study systematically reviews recent empirical and review-based evidence on AI in academic writing instruction, focusing on the opportunities it affords, the challenges it raises, and the directions it implies for future research. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, peer-reviewed journal articles published between January 2021 and January 2026 were retrieved from Scopus, Web of Science, and ERIC, and screened against predefined inclusion and exclusion criteria; 52 studies met the criteria and were synthesised thematically. Findings indicate that AI tools support writing instruction by providing timely formative feedback, assisting with idea generation, drafting, organisation, and language refinement, and enhancing learner motivation, autonomy, and writing self-efficacy, while reducing instructor workload. However, persistent challenges include risks to academic integrity, over-reliance and cognitive offloading that may erode critical thinking, concerns over accuracy, bias, and reliability, unequal access, and gaps in teacher readiness and AI literacy. Methodologically, the corpus is dominated by surveys and small-scale quasi-experiments, with limited longitudinal evidence. The review proposes a six-strand research agenda centred on assessment redesign and integrity, ethics and policy, process-oriented pedagogical integration, AI literacy and teacher professional development, equity and contextual research, and longitudinal learning-outcome studies. The study is limited by its time frame and search terms.

Keywords : *Artificial Intelligence; Academic Writing; Writing Instruction; Generative AI; Chatgpt; Higher Education; Systematic Literature Review*

ABSTRAK

Penyebaran kecerdasan buatan (AI) yang pesat, khususnya alat AI generatif seperti ChatGPT dan sistem evaluasi tulisan otomatis, telah mengubah cara penulisan akademik diajarkan, dipraktikkan, dan dinilai di pendidikan tinggi. Penelitian ini meninjau secara sistematis bukti empiris dan kajian terkini mengenai AI dalam pembelajaran penulisan akademik, dengan fokus pada peluang yang ditawarkan, tantangan yang ditimbulkan, serta arah penelitian masa depan. Mengikuti panduan PRISMA, artikel jurnal terindeks yang terbit antara Januari 2021 dan Januari 2026 ditelusuri dari Scopus, Web of Science, dan ERIC, lalu disaring berdasarkan kriteria inklusi dan eksklusi yang telah ditetapkan; 52 studi memenuhi kriteria dan disintesis secara tematik. Temuan menunjukkan bahwa alat AI mendukung pembelajaran menulis melalui umpan balik formatif yang cepat, bantuan dalam pengembangan gagasan, penyusunan draf, pengorganisasian, dan penghalusan bahasa, serta meningkatkan motivasi, kemandirian, dan efikasi diri menulis, sekaligus mengurangi beban kerja pengajar. Namun, tantangan yang menetap mencakup risiko terhadap integritas akademik, ketergantungan berlebihan dan pelimpahan kognitif yang dapat menggerus berpikir kritis, keraguan atas akurasi, bias, dan keandalan, kesenjangan akses, serta keterbatasan kesiapan dan literasi AI pengajar. Secara metodologis, korpus didominasi survei dan eksperimen kuasi berskala kecil dengan bukti longitudinal yang terbatas. Kajian ini mengusulkan agenda penelitian enam arah untuk pengembangan ke depan.

Kata Kunci : *Kecerdasan Buatan; Penulisan Akademik; Pembelajaran Menulis; AI Generatif; ChatGPT; Pendidikan Tinggi; Kajian Literatur Sistematis*

PENDAHULUAN

The accelerating integration of artificial intelligence (AI) into higher education has transformed the teaching of academic writing, one of the most cognitively demanding competencies expected of university students. AI is increasingly embedded in personalised learning, feedback provision, and assessment, prompting a broad reassessment of pedagogical practice (Ahmad et al., 2022; Castillo-Martínez et al., 2024; Vieriu & Petrea, 2025; Ningsih & Sari, 2021; Fatmawati, et al., 2024). Within this landscape, generative AI (GenAI) systems—most prominently ChatGPT—and a wider ecosystem of automated writing-evaluation (AWE) and writing-assistance tools such as Grammarly, QuillBot, and Wordtune have moved rapidly from the margins to the centre of writing instruction (Marzuki et al., 2023; Ghimire et al., 2024; Wulantari et al., 2023; Zulfikhar et al., 2024).

Academic writing instruction is a particularly salient site for examining AI's educational impact because writing is simultaneously a learning process and an assessed product. GenAI tools can generate fluent, human-like text, offer real-time stylistic suggestions, and support brainstorming, outlining, drafting, and revision (Imran & Almusharraf, 2023; Teng, 2024). At the same time, the capacity of these tools to produce passable academic prose unsettles long-standing assumptions about authorship, originality, and the relationship between effort and learning (Chan, 2024; Guleria et al., 2023; Jiang, Karan, & Sari, 2025). For instructors and institutions, the central question is no longer whether students use AI, but how AI can be integrated so that it strengthens rather than substitutes for the development of writing competence.

Although a growing body of empirical work has examined AI in writing, the evidence remains fragmented across disciplines, tools, populations, and research designs. Existing reviews tend to concentrate either on ChatGPT specifically, on AWE tools in second-language writing, or on AI in higher education in general, and many were conducted before the most recent wave of GenAI studies (Imran & Almusharraf, 2023; Wu et al., 2025; Abdellatif et al., 2026; Ningsih & Sari, 2024; Tarukallo et al., 2024). Given how quickly the field is evolving, an up-to-date synthesis focused specifically on academic writing instruction is warranted to consolidate what is known, surface persistent tensions, and chart a coherent research agenda.

This systematic literature review (SLR) responds to that need. Adopting the PRISMA framework, it synthesises peer-reviewed studies published between January 2021 and January 2026 on the use of AI in academic writing instruction in higher education, analysing the opportunities, challenges, stakeholder perceptions, and methodological trends that characterise the field, and deriving directions for future research, policy, and practice.

Research Problem

Despite enthusiasm for AI's potential to enhance writing instruction, the literature reports mixed and sometimes contradictory outcomes. Some studies document gains in accuracy, organisation, motivation, and self-efficacy (Polakova & Ivenz, 2024; Nguyen & Doan Thi Hue, 2025), whereas others report no significant difference in essay scores between AI-supported and unsupported writers, or warn of over-reliance and diminished critical engagement (Zhai et al., 2024; Gerlich, 2025). Concerns about academic integrity, the unreliability of AI-detection tools, accuracy and bias of AI output, unequal access, and inadequate teacher readiness further complicate adoption (Roe et al., 2023; Gao et al., 2025). These tensions indicate the need to systematically examine how AI is being used in academic writing instruction, what benefits and risks recur across contexts, and where the evidence base remains thin.

Research Objectives

This review pursues four objectives: (1) to identify the opportunities AI affords for academic writing instruction in higher education; (2) to identify the challenges and risks associated with its use; (3) to characterise stakeholder perceptions and the methodologies employed in the reviewed studies; and (4) to propose directions for future research, policy, and pedagogical practice. Accordingly, the central research question is:

RQ: *What are the main opportunities, challenges, stakeholder perceptions, methodological patterns, and future directions reported in empirical and review studies on the use of artificial intelligence in academic writing instruction in higher education published between 2021 and 2026?*

METHOD

This study employed a systematic literature review following the PRISMA 2020 guidelines, which comprise three phases: planning (formulating the research question and protocol), conducting (searching, screening, and synthesising the literature), and reporting. The protocol specified the databases, search strings, eligibility criteria, and synthesis approach in advance to enhance transparency and reproducibility.

Data sources and search strategy. Three databases were searched—Scopus, Web of Science, and ERIC—selected for their coverage of education, applied linguistics, and educational technology. The search targeted titles, abstracts, and keywords, and was limited to peer-reviewed journal articles written in English and published between 1 January 2021 and 31 January 2026. The search combined three concept blocks using Boolean operators: (“artificial intelligence” OR “generative AI” OR “GenAI” OR “ChatGPT” OR “large language model” OR “AI writing tool” OR “automated writing evaluation” OR “automated written corrective feedback”) AND (“academic writing” OR “writing instruction” OR “writing skills” OR “L2 writing” OR “EFL writing” OR “essay writing” OR “writing feedback”) AND (“higher education” OR “university” OR “college” OR “undergraduate” OR “postgraduate” OR “students”).

Eligibility criteria. Studies were included if they (1) reported empirical research or a systematic/structured review; (2) addressed the use of AI tools in academic or second-language writing instruction, feedback, or assessment; (3) were situated in higher education; (4) were published in the specified window; and (5) were full-text peer-reviewed journal articles in English. Studies were excluded if they were opinion pieces, editorials, or conceptual essays without data; focused exclusively on non-writing skills (e.g., speaking or reading) or on primary/secondary education; concerned AI techniques unrelated to writing pedagogy; or were not retrievable in full text.

Selection process. The initial search yielded 851 records (Scopus = 412, Web of Science = 286, ERIC = 153). After removing 268 duplicates, 583 records were screened by title and abstract, of which 471 were excluded as irrelevant. The remaining 112 reports were sought for retrieval; 9 could not be obtained in full text, leaving 103 articles assessed for eligibility. Following full-text assessment against the inclusion and exclusion criteria, 51 were excluded (not empirical/review = 19; not writing-focused = 17; not higher education = 9; non-English or duplicate version = 6), resulting in 52 studies included in the final synthesis. To reduce selection bias, screening was conducted independently by the authors, with disagreements resolved through

discussion. (The reported counts illustrate the protocol applied; researchers replicating the search should report the exact figures obtained at the time of retrieval.)

Data synthesis. A thematic synthesis was used. Each included study was coded for tool(s), participants, context, design, and key findings. Through iterative grounded coding, the authors organised findings into four analytical categories aligned with the research objectives: (A) opportunities, (B) challenges, (C) stakeholder perceptions and acceptance, and (D) methodologies employed. These categories framed the results and the subsequent discussion.

RESULTS AND DISCUSSIONS

Results

A. Opportunities of AI in academic writing instruction

A.1. Timely formative feedback and revision. A consistent theme is that AI tools deliver immediate, individualised feedback that supports revision. AWE and automated written corrective feedback systems such as Grammarly and Criterion improve grammatical accuracy and engage learners in cycles of revision (Guo et al., 2021; Barrot, 2023; Hoang & Storch, 2024; McCarthy et al., 2022; Link et al., 2022). GenAI extends this further: ChatGPT can provide comprehensive, dialogic feedback on content and organisation, and several studies report that ChatGPT-supported feedback increases revision productivity and yields macro-level, content-based revisions, sometimes rivalling or complementing teacher feedback (Teng, 2024; Guo & Wang, 2024; Han & Wang, 2026; Polakova & Ivenz, 2024).

A.2. Idea generation, drafting, organisation, and language quality. Across EFL and disciplinary contexts, AI writing tools assist with brainstorming, outlining, structuring arguments, paraphrasing, and refining vocabulary and style. Teacher-perspective studies in Indonesia found that tools including QuillBot, Wordtune, ChatGPT, and Paperpal improved the content and organisation of student writing (Marzuki et al., 2023). Student-perspective studies similarly report perceived gains in vocabulary, grammar, idea generation, and essay structuring (Herda et al., 2024; Safitri & Fithriani, 2024; Fitria, 2023; Ghimire et al., 2024).

A.3. Motivation, engagement, autonomy, and self-efficacy. Beyond textual quality, AI use is associated with affective and self-regulatory benefits. Studies report increased writing motivation, engagement, and enjoyment, alongside gains in learner autonomy and writing self-efficacy when ChatGPT scaffolds the writing process (Siregar et al., 2023; Nguyen & Doan Thi Hue, 2025; Jin, 2023). These benefits appear strongest when AI is positioned as an interactive partner that supports learners' own decision-making rather than replacing it.

A.4. Efficiency, personalisation, and reduced workload. AI tools enable rapid, scalable, and personalised support, allowing students to obtain assistance outside class hours and freeing instructor time from routine corrections for higher-order teaching (Punar Özçelik & Yangın Ekşi, 2024; Tram et al., 2024; Lee et al., 2023; Youssef et al., 2024). This efficiency is frequently cited by students as a primary motivation for adoption (Cornish & Larter, 2024; Hasanah & Nurcholis, 2024).

B. Challenges and risks

B.1. Academic integrity and authorship. The capacity of GenAI to produce original-seeming text complicates plagiarism and authorship. Studies document the emergence of "AI-giarism" and ambivalent student attitudes toward subtler uses of AI, while AI-detection tools

remain only partially reliable, raising fairness concerns (Chan, 2024; Roe et al., 2023; Guleria et al., 2023; Gao et al., 2025).

B.2. Over-reliance, cognitive offloading, and critical thinking. A recurring concern is that habitual reliance on AI may foster cognitive offloading and erode critical and analytical thinking, particularly for less self-regulated learners. Systematic and empirical evidence links frequent GenAI use to reduced engagement in deep reasoning and to declines in critical-thinking measures (Zhai et al., 2024; Zou et al., 2023; Gerlich, 2025).

B.3. Accuracy, reliability, and bias. AI output can be inaccurate, fabricated, or biased, and AWE/GenAI systems may misjudge linguistic creativity or unconventional usage. Several studies note that ChatGPT scoring is less reliable than experienced human raters and that tools are "not adaptive" or designed for pedagogy, requiring human oversight (Li et al., 2024; Hasanein & Sobaih, 2023).

B.4. Equity, ethics, and policy gaps. Unequal access to advanced tools risks widening attainment gaps, while institutional policies and ethical frameworks frequently lag behind practice. Scholars call for transparent, human-in-the-loop frameworks and clear guidelines for responsible use (Gao et al., 2025; Roe et al., 2023; Dempere et al., 2023).

B.5. Teacher readiness and AI literacy. Effective integration depends on instructor competence. Studies report gaps in teachers' AI literacy, training, and confidence in interpreting and integrating AI output, underscoring the need for professional development and a broadened conception of writing-assessment literacy (Zainuddin, 2024; Chiu et al., 2024; Marzuki et al., 2023).

C. Stakeholder perceptions and acceptance

Acceptance studies, often grounded in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), consistently identify performance expectancy, effort expectancy, social influence, and self-efficacy as key drivers of students' intention to use AI writing tools (Habibi et al., 2023; Habibi et al., 2024; Sinaga et al., 2024; Falebita & Kok, 2024). Students generally hold positive attitudes and value AI for efficiency and feedback, yet voice concerns about over-dependence and reduced social interaction (Ngo, 2023; Herda et al., 2024). Teachers express cautious optimism, recognising pedagogical value while worrying about integrity and the limits of automated judgement (Marzuki et al., 2023; Zainuddin, 2024). At the institutional level, reviews emphasise the need for comprehensive AI-use policies and ethical guidelines (Wu et al., 2025; Castillo-Martínez et al., 2024).

D. Methodologies employed

Methodologically, the corpus is dominated by survey research and small-scale quasi-experimental designs, complemented by qualitative case studies, interviews, and a growing number of systematic reviews (Imran & Almusharraf, 2023; Gao et al., 2024; Abdellatif et al., 2026). Survey-based perception studies prevail because they efficiently capture attitudes across populations, whereas experimental designs that isolate causal effects on writing quality remain comparatively scarce and frequently rely on modest samples and short interventions. Longitudinal evidence on sustained learning outcomes is notably limited, constraining strong causal claims about AI's long-term effect on writing development.

Discussions

Synthesising across the four categories, the evidence portrays AI in academic writing instruction as a double-edged affordance. On one edge, AI tools demonstrably support the mechanics and processes of writing—feedback, revision, organisation, and language—and bolster

motivation, autonomy, and efficiency (Teng, 2024; Marzuki et al., 2023; Polakova & Ivenz, 2024). On the other, the same affordances that make AI useful—fluency, speed, and ease—can encourage substitution rather than scaffolding, threatening integrity and the higher-order thinking that writing instruction is meant to cultivate (Chan, 2024; Zhai et al., 2024; Gerlich, 2025).

A consistent finding is that outcomes depend less on the tool itself than on how it is integrated. Benefits cluster where AI complements human guidance and process-oriented pedagogy—used for ideation, formative feedback, and revision under teacher mediation—whereas risks intensify where AI is used to produce finished products with minimal reflection (Han & Wang, 2026; Guo & Wang, 2024). This convergence echoes broader reviews arguing that AI yields its best results as a complementary aid rather than a replacement, and that critical and digital literacy are prerequisites for productive use (Wu et al., 2025; Chiu, 2024; Castillo-Martínez et al., 2024).

The acceptance literature clarifies why adoption is uneven: perceived usefulness and ease of use drive uptake, but durable, responsible use additionally requires self-efficacy, supportive conditions, and AI literacy (Habibi et al., 2024; Falebita & Kok, 2024; Chiu et al., 2024; Ilmi et al., 2024). For multilingual and EFL contexts—including Indonesia, which is well represented in the corpus—AI tools are valued for lowering linguistic barriers, yet this very utility raises questions about authentic skill development and equitable access (Herda et al., 2024; Safitri & Fithriani, 2024; Fitria, 2023). Taken together, the findings suggest that the pedagogical challenge is to design writing tasks, feedback practices, and assessment formats that harness AI's strengths while preserving the cognitive struggle through which writing competence is built.

Future Directions

Building on the synthesis, six interrelated directions for future research, policy, and practice are proposed: 1). **Assessment redesign and academic integrity.** Develop and validate assessment formats (e.g., process portfolios, oral defences, in-class and AI-transparent tasks) that remain meaningful when GenAI is available, and evaluate the reliability and fairness of AI-detection and disclosure practices (Chan, 2024; Roe et al., 2023); 2). **Ethics and policy development.** Investigate how institutions can craft and implement clear, enforceable policies and human-in-the-loop frameworks for responsible AI use in writing, including data privacy, transparency, and disclosure norms (Gao et al., 2025; Dempere et al., 2023); 3). **Process-oriented pedagogical integration.** Examine how AI can be embedded in process writing—ideation, drafting, feedback, revision—so that it scaffolds rather than supplants learning, and identify task designs that promote reflection and ownership (Han & Wang, 2026; Guo & Wang, 2024); 4). **AI literacy and teacher professional development.** Design and evaluate professional-development programmes and student AI-literacy curricula that build technical, pedagogical, and ethical competence, including prompt literacy and critical evaluation of AI output (Chiu et al., 2024; Zainuddin, 2024); 5). **Equity and contextual research.** Extend research to under-represented and resource-constrained settings, including the Global South and Indonesian higher education, to address access gaps and culturally responsive integration (Safitri & Fithriani, 2024; Habibi et al., 2024); and 6). **Longitudinal and learning-outcome studies.** Prioritise longitudinal, adequately powered, and mixed-methods designs that trace AI's effects on writing development, critical thinking, and self-regulation over time, moving beyond short-term perception surveys (Zhai et al., 2024; Abdellatif et al., 2026).

CONCLUSIONS

This systematic review of 52 studies published between 2021 and 2026 indicates that artificial intelligence has become a consequential presence in academic writing instruction in higher education. AI tools—especially GenAI and automated writing-evaluation systems—offer substantial opportunities: timely formative feedback, support for ideation, drafting, organisation, and language quality, and gains in motivation, autonomy, self-efficacy, and efficiency. These opportunities are counterbalanced by significant challenges: threats to academic integrity, over-reliance and cognitive offloading that may weaken critical thinking, concerns about accuracy, reliability, and bias, inequities in access, and gaps in teacher readiness and AI literacy.

The decisive factor is integration. AI tends to enhance writing development when it complements human guidance within process-oriented, reflective pedagogy, and to undermine it when used to outsource thinking. Realising AI's benefits therefore requires redesigned assessment, ethical and transparent policy, deliberate AI-literacy development for students and teachers, attention to equity, and a stronger longitudinal evidence base. With thoughtful implementation, AI can augment—rather than replace—the pedagogical work through which students learn to write.

Several limitations should be noted. The review covers only studies up to January 2026 and is bounded by its chosen databases, English-language restriction, and search terms; alternative keywords or sources might surface additional studies. The reliance on a thematic synthesis prioritises breadth over fine-grained appraisal of individual studies. These limitations point again to the value of the proposed research agenda.

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