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| REVIEW ARTICLE

Generative Artificial Intelligence in English Academic Writing: A Systematic Review

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| ABSTRACT
This systematic review examines the researches on Generative Artificial Intelligence (GenAI) in English academic writing from 2021 to 2026. Following PRISMA guidelines, we analyzed 92 articles from various databases to explore the field's progression, including the effects of GenAI on English academic writing and whether individual differences and psychological variables matter. Besides, Interaction Modes and Reliance Issues are also explored. The findings reveal an unprecedented growth in publications, with a significant shift from exploratory researches to systematic case studies. The analysis identified different opportunities provided in different stages of academic writing: In pre-writing stage, GenAI can help brainstorm ideas and clarify task requirements, and it enables fluent and accurate expression of ideas in while-writing stage. Besides, it improves textual accuracy and revision efficiency when drafting. However, it also posts challenges at the same time. This review provides a clearer understanding of GenAI's role in English academic writing and offers implications for both research and pedagogical practice.

| KEYWORDS
Generative Artificial Intelligence, GenAI, English Academic Writing, L2 Writing, Systematic Review

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1. Research Background and Objectives

In the process of English academic writing, learners may encounter multiple challenges, such as difficulties in constructing the structure, lack of linguistic resources and higher level of anxiety in writing (Kim et al. 2021; Zhou et al. 2022). Previous researches have shown that these difficulties may cause learners to avoid writing tasks, and at the same time, generate negative learning experiences (Yan, 2023), especially for those whose linguistic ability is poor (Wang, 2025).

In recent years, a great number of Generative Artificial Intelligence (GenAI) tools such as Deepseek and ChatGPT have been applied to various educational practices, which has brought profound changes, especially in the field of English Academic writing (Dai et al., 2025). Recent improvements in Large Language Models (LLMs) enable GenAI tools to generate coherent discourse, and offer appropriate feedback immediately on learners' written output (Xu & Gu, 2025). Previous researches have suggested that GenAI tools may offer help in different stages of writing, which includes the pre-writing stage, while-writing stage and revision stage (Meniado et al. 2024; Heydarnejad, 2025). Because of its convenience and versatility, more and more students start applying GenAI tools more frequently in their writing process, and relying on it for suggestions and feedback. As a result, writing, traditionally regarded as one of the most cognitively demanding skills in second language acquisition, is undergoing a fundamental transformation.

Even though a large number of researches have focused on the positive effects of GenAI tools in English academic writing, its negative effect has also gained attention gradually. Previous researches have pointed out that learners may rely too much on the contents and feedback provided by GenAI tools, thus diminishing their ability of thinking independently and critically (Zhang et al., 2024; Huang & Wu, 2025). Besides, relying too much on GenAI tools may decrease the opportunities for students to practise, thus posing negative effect in their development of writing independently (Wang, 2025).

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Owing to these affordances, a rapidly growing body of research has emerged to investigate the effectiveness, pedagogical applications, and broader implications of GenAI in English academic writing. However, despite the increasing volume of empirical studies, research findings remain inconsistent. On the one hand, numerous studies report positive effects of GenAI on writing quality, linguistic accuracy, and learning efficiency (Meniado et al., 2024; Liu & Zhang, 2025; Wang et al., 2025). On the other hand, some scholars caution that excessive reliance on GenAI may weaken learners' independent thinking, reduce originality, and lead to problematic dependency patterns (Wang, 2024; Kim et al., 2025).

Given these mixed findings, there is a clear need for a systematic synthesis of existing research to clarify current trends, unresolved issues, and research gaps. Therefore this literature review examines 92 representative empirical studies on GenAI-assisted English academic writing. The objectives of this review are: (1) to summarize major research themes and key findings, (2) to identify limitations in existing research, and (3) to propose directions for future studies. By doing so, this review aims to provide a clearer understanding of the role of GenAI in English academic writing and offer implications for both research and pedagogical practice. Specifically, we address the following research questions in the review study:

RQ1: How has GenAI been integrated into academic writing, and what does GenAI bring to academic writing?

RQ2: What are the challenges associated with using GenAI in English academic writing?

RQ3: What are the emerging insights and gaps in the literature, and what directions do they suggest for future research in generative AI for language education?

Through investigating these questions, this review aims to provide an in-depth understanding of how empirical research on GenAI-assisted English academic writing has developed since 2021, helping identify both the current state of research and critical gaps requiring further investigation. This review will help researchers and practitioners better understand existing research efforts and guide further directions in integrating GenAI into language teaching and learning.

2. Methodology

2.1 Systematic literature review initiation

This systematic review follows the protocol established by Butler et al. (2016) and adheres to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines as outlined in 2015 (PRISMA, 2015) and 2020 guidelines (Page et al., 2021).

2.1.1. Literature retrieval

Four primary databases, ScienceDirect, Springer, Google Scholar and Web of Science (WoS) were strategically chosen for their extensive collection of peer-reviewed articles. The development of search terms and the construction of the search query were guided by the research questions and informed by an initial systematic review of the field and an examination of key papers in the domains of GenAI and English academic writing. For each conceptual cluster, we identified a range of terms to capture the breadth of relevant literature. The final search query was constructed using Boolean operators to combine terms within and across the conceptual clusters below:

("Generative Artificial Intelligence" OR "GenAI" OR "GAI" OR "Large Language Model" OR "LLM" OR "ChatGPT" OR "GPT" OR "Gemini" OR "AI chatbot" OR "AI-assisted writing" OR "AI-supported writing: OR "AI writing tool" OR "Conversational AI") AND ("L2 writing" OR "second language writing" OR "EFL writing" OR "ESL writing" OR "foreign language writing" OR "English academic writing" OR "academic writing"OR "English writing" OR "writing performance" OR "writing feedback" OR "writing revision" OR "essay writing")

We employed a two-round systematic search strategy (Li et al., 2024). The initial research was conducted on June 22, 2026, following established systematic review protocols (Page et al., 2021; PRISMA, 2015). The first round served multiple methodological purposes: it enabled preliminary screening and analysis of the existing literature, facilitated the development of evaluation criteria, and informed the refinement of our research questions. Furthermore, this initial phase was instrumental in the development of our coding framework, which emerged through iterative analysis of the identified literature.

Following the preliminary analysis phase, during which we systematically evaluated the collected articles and refined our inclusion and exclusion criteria, we conducted a second round of researches on July 8, 2026. Due to the publication lag, database indexing practices, and the availability of early-access research, this approach captured articles beyond the search date. To maintain clear temporal boundaries, we excluded articles with publication dates extending into 2026. This dual-phase search strategy offered several methodological advantages. First, it allowed for the systematic development and validation of our

analytical framework through iterative refinement. Second, it enabled us to capture emerging literature that might have been missed in a single-point search. Third, it provided sufficient time for the thorough development and validation of our codebook, which was essential for ensuring coding reliability and analytical rigor.

2.1.2 Literature Screening

The initial search yielded 984 articles. The screening of identified articles was conducted in July 8, 2026, using Rayyan, a web-based application designed for systematic reviews. It was only used during the screening process, while the inclusion and exclusion decisions (Table 1) are all made by the author himself. The decisions are made based on predefined criteria from Li et al. (2025), without autonomous influence from Rayyan. The key features we used from Rayyan are (1) tagging and organization of articles, (2) independent review capabilities, (3) decision comparison tools, and (4) screening record maintenance.

Table 1

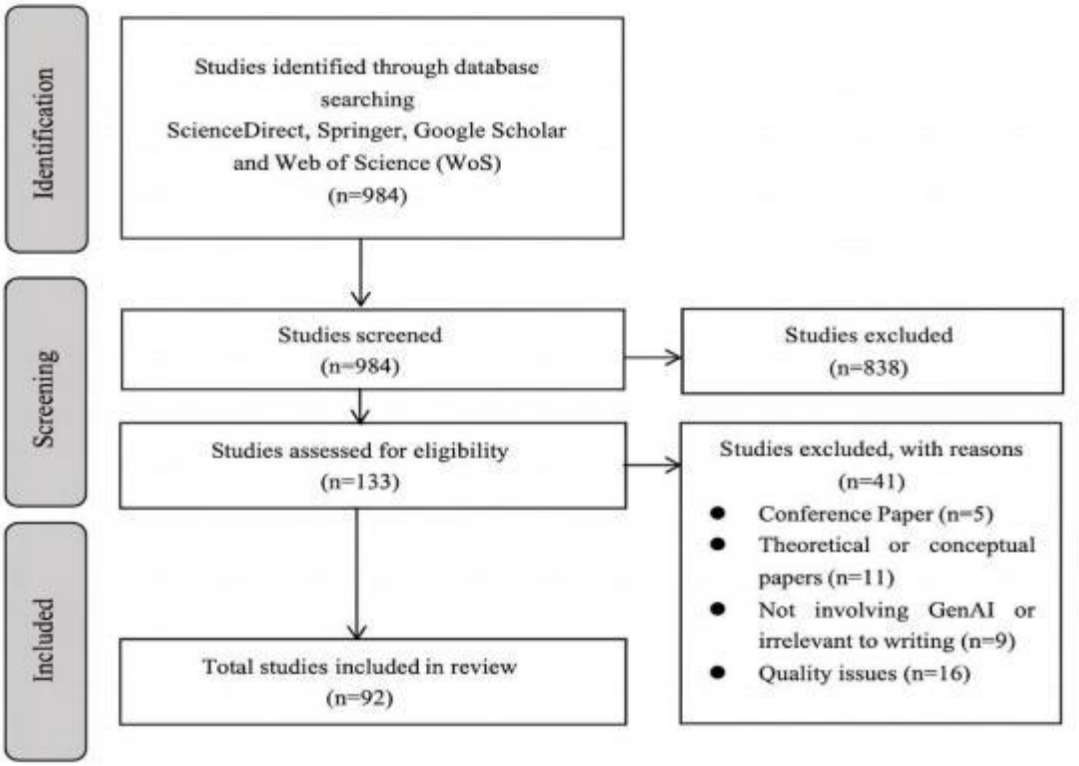
Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Research employing traditional empirical studies (quantitative, qualitative, and mixed methods) or innovative methodological approaches that may be particularly suited to GenAI and English academic writing.	Theoretical papers, literature reviews, or commentaries without original empirical data.
Studies examining use of GenAI in English academic writing that provide substantial and evidence-based insights are also included.	Studies fail to provide sufficient information about the study context and participants, or the methods of data collection are unclear or inadequately justified.
Studies focus on the use of GenAI in English academic writing and reliance on GenAI tools.	Studies not specifically focused on English academic writing (e.g., general education or other subject areas).
Studies published in peer-reviewed journals between 2021 and 2026 in English.	Studies published in languages other than English.
Studies that explore the use, impact, or potential of GenAI in English academic writing, including but not limited to general language proficiency, learner engagement, or pedagogical applications.	Studies that only propose the development or review of GenAI tool without completing empirical testing of the model they reviewed or created.
Research investigating students' perceptions, attitudes, or experiences with GenAI in English academic writing context.	Research published in non-peer-reviewed sources (e.g., conferences, proceedings, preprints).

The author himself independently performed the screening process. During the screening phase, 838 records were excluded based on abstract reading, for reasons such as irrelevance to the topic, lack of focus on GenAI or writing process, or being published before 2021. This left 146 reports for retrieval, of which 13 could not be retrieved. Out of the 133 reports assessed for eligibility, 41 were excluded for reasons such as being theoretical or conceptual papers, not involving GenAI, or having quality issues. Ultimately, 92 studies were included in the final review.

Figure 1

PRISMA Flow Diagram



3. Data Analysis Process

The data analysis process was guided by our research questions and is conducted around three domains. Firstly, we analyzed the quality of papers, which included the journal metrics (SSCI/ESCI indexing, Impact Factors), research methodologies (qualitative research, quantitative research, mixed methods), and theoretical frameworks (identified and categorized theoretical foundations). This is to ensure the articles or papers we analyze in this research has high academic rigor and comparability. Eventually 92 articles out of 984 articles were chosen for this research.

Second, thematic analysis was conducted to systematically code and categorize the 92 articles we've chosen in the research. The framework of coding was constructed iteratively: initial coding was formed according to a preliminary reading of the articles, and were subsequently refined and improved in light of the research questions. Coding mainly focused on the following dimensions: (1) the specific ways of use of GenAI in English academic writing and main stages (including pre-writing, during-writing and revision stages); (2) the effects of GenAI on writing performance, cognitive processes and psychological factors; (3) over-reliance on GenAI and its underlying mechanisms; (4) individual difference, ethical concerns and equity issues; (5) existing limitations and gaps for future research.

Third, focusing on our three research questions, we conducted narrative synthesis individually. For RQ1, we mainly sorted out the functions and effects of GenAI on different stages of English academic writing; while we focused on challenges such as reliance issues, the diminishing of critical thinking and the risk of academic dishonesty; and for RQ3 we summarized the current findings, identified research gap and put out the future research directions. The author himself conducted the whole process of analyzing, and the result of coding is checked multiple times for consistency and accuracy, which may formulate the systematic identification of current research status of GenAI-assists English academic writing.

4. Findings

4.1 RQ1: application of GenAI in English academic writing

Previously there are a variety of researcher conducted surveys about the application of GenAI in English academic writing, and also expressed deeply about its availability and effect on learners. "GenAI-assists English academic writing" has always been a hotly-debated topic, no matter in China or foreign countries. Over these years, a large number of empirical or experimental researches has been conducted to examine the effect of GenAI on English academic writing, and the common finding of these researches is that GenAI tools may help improve learners' writing performance, no matter in grammar accuracy, lexical variety,

syntactic complexity, and passage coherence (Joel C. Meniado et al. 2024 ; Liu & Zhang, 2025 ; Wang et al. 2025). These improvements are often attributed to GenAI's ability to provide immediate and explicit feedback, which allows learners to notice and correct language errors more efficiently than just themselves alone. Such findings are consistent with form-focused instruction perspectives, which emphasize the importance of timely feedback for language development.

4.1.1 The usage of GenAI in different stages of writing

Researches have shown that GenAI may assist English academic writing in different stages of writing.

Pre-writing stage is the basis of whole writing process, and it's regarded as the critical stage that determines the quality of subsequent writing outcomes. The pre-writing phase mainly includes sessions like brainstorming, idea generation, information search and assessment, mind mapping, and outlining. These sessions may help the writer clarify their writing purposes, explore potential arguments, build up logical frameworks, and accumulate rich contents for formal drafting (Gabay et al., 2026).

For those learners whose mother tongue isn't English, pre-writing usually challenges them the most because of the limitation in expressing, differences in cultural backgrounds and heavy cognitive load, which will easily lead to limited thinking, chaotic organizations and writing anxiety (Xiao et al., 2026). The application of GenAI in pre-writing stage has provided sufficient support for learners.

In the pre-writing stage, previous researches have indicated that GenAI may help learners by generating ideas, texts or outlines (Wang & Guo, 2025), and also improve the efficiency of idea generation, which may help the learners spread and generalize their ideas, improve the confidence in sharing, thus improving their writing performance (Kim et al., 2025; Alpar, 2025). In addition, GenAI may also help learners brainstorm a lot in their writing, which may lessen their burden in writing and also build up their confidence in writing (Ali et al., 2025). For example, in EFL classrooms, the GenAI-assisted collaborative pre-writing (GACP) approach not only enhances the content richness of outline, but also strengthens learners' critical evaluation of GenAI output through peer discussion, therefore reducing the risk of blind reliance. This support has been shown to reduce writing anxiety and increase learners' confidence, particularly among lower-proficiency learners who may otherwise struggle to begin writing tasks. Reduced anxiety, in turn, may contribute to more sustained engagement and greater willingness to revise texts.

During-writing stage is the core of whole writing process. In this stage, the writer should turn the idea and outline they generate in pre-writing stage into coherent passage, which may concern the construction of sentences and paragraphs, the elaboration of arguments, and the maintenance of overall logical accuracy (Chen & Pi, 2026). Unlike as the planning nature of pre-writing, during-writing focus more on dynamic cognitive processing and language production, therefore doubles up the stress on learners, who may need to handle both the generation of contents and formal expression (Connell et al., 2025). For those EFL and ESL learners, the challenges are more obvious in this stage, since they should not only handle the limitation of English vocabulary and grammar, but also monitor the consistency quite often in the writing. This may usually lead to situations like "writer's block" or unstable writing qualities (Sanz-Tejeda et al., 2025).

In the during-writing stage, previous researches have shown that GenAI can be worked as a "writing assistant", which is different from the "idea bank" role in the pre-writing stage (Hardy et al., 2026). It can provide students with support from different points such as vocabulary, grammar, and language, which may help the learners better express themselves (Wang et al. 2024; Heydarnejad, 2025). Besides, it may also help the students write the subsequent paragraphs, rewrite the sentences, give suggestions on transition words or provide alternative expressions, thus reducing language anxiety and speeding up the process of drafting (Shabir, 2025). Latest researches have shown that using GenAI appropriately may help improve the richness of vocabulary and complexity of syntax, and at the same time, leave learners more time to focus on the depth of argumentation rather than basic language expression (Albadarin et al., 2024; van Wyk, 2025). For example, Moorhouse et al. (2025) has examined 21 postgraduate students through in-depth focus group interviews and a preference selection task, in order to explore the role of GenAI in English academic writing. Researches have shown that students applied GenAI widely in during-writing stage, which includes generating the structure, polishing the language, changing the expressions, and real-time support for continuing paragraphs, which may help them overcome the expression burdens, improve the complexity of texts, and focus more on the depth of argumentation. This "human-AI collaboration" model gave L2 writers a significant sense of empowerment, while also reminding them of the need to develop critical digital literacies to avoid false empowerment and over-reliance (Moorhouse et al., 2025).

The revision stage, which is also known as the editing or polishing stage, is the refinement and improvement phase of the writing process. In this phase, learners may check their draft systematically, which mainly includes checking the content accuracy, optimizing the logical coherence, adjusting the language style, correcting the grammatical errors, and also integrating the feedback of learners into the passage. Unlike the planning nature of pre-writing stage, or the generating nature of during-

writing stage, revision stage focuses more on critical reflection and iterative improvement, which is a critical step in determining the final quality of their text. For those EFL and ESL learners, this stage usually posts significant challenges, since they should not only recognize their own language errors, but also improve metacognitive skills to evaluate the persuasiveness and whole structure of their passages. As a result, they may usually ignore deeper content issues due to limitations in language proficiency.

In the revision stage, previous researches have shown that GenAI can play a significant role in this stage. Studies show that learners who use GenAI for revision may produce texts with fewer surface-level errors and improved linguistic accuracy (Tahereh Heydarnejad, 2025). Besides, students may focus more on higher-level thinking rather than basic language correction, since GenAI tools may help the learners by improving the accuracy, clarity and academic appropriateness of texts (Michel et al., 2025; Li et al., 2026). For example, Michel et al. (2025) examined how students learning German as a foreign language engaged in collaborative writing and revision by using GenAI tools. By using methods like screen-recording, text quality assessment, and analysis of dialogues, the study found that AI-generated model texts serving as "coping models"effectively triggered critical comparison and negotiations during the revision stage. This promoted language-related episodes (LREs) and task-related episodes (TREs), leading to significant improvements in content, coherence, and comprehensibility of the texts — especially in highly collaborative pairs. This research has shown that in the revision stage, GenAI can not only provide appropriate feedback and iterative optimization, but also can act as "writing assistant" to help learners deepen arguments, refine the structures, and at the same time, develop the ability to evaluate the output of GenAI critically.

4.1.2 The affective and motivational outcomes of GenAI in academic writing

Apart from the application of GenAI in different stages of academic writing, researches also focus on the affective and motivational impacts of GenAI, including changes in learners' engagement, self-efficacy, writing anxiety and intrinsic motivation. Previous researches have shown that GenAI can not only improve obviously on learners' emotional engagement, self-efficacy and intrinsic motivation, but also reduce writing anxiety, and at the same time, create a more creative and supportive environment for learners.

Multiple researches have shown that GenAI may strengthen learners' emotional engagement and provide more positive affective experiences. Nguyen et al. (2024) found in their experiment with Vietnamese EFL learners at the pre-writing stage that compared with traditional writing with paper and pens, learners who used ChatGPT reported higher level of affective engagement, including willingness to participate, interest, motivation. This kind of increase in emotional engagement is not only reflected in immediate usage but also showed a positive correlation with final writing performance, which indicate that positive emotion may transfer into the improvement in writing outcomes. Besides, Apriani et al. (2024) revealed further in their mixed-methods study that students who used AI-powered chatbot to assist their writing improved greatly in their self-efficacy, with the experimental group showing a markedly greater improvement from pre-test to post-test compared with the control group. At the same time, students also reported that they had more motivation to complete the writing tasks more flexibly, since the AI-powered chatbot may help them break the limit of time and space. Students from the experimental group also revealed that they could overcome anxiety in writing more effectively. Bai et al. (2024), in their study on Scenario-Based Learning, also observed that carefully selected and verified AI-generated instructional scenarios significantly enhanced students' intrinsic motivation and positive learning attitudes, leading learners to demonstrate greater enthusiasm and engagement in authentic or simulated task contexts.

While GenAI works more effectively in self-efficacy and writing confidence. Wang et al. (2024), in their mixed-methods study, found that students in the experimental group who used GenAI tools reported a significant increase in writing confidence. Students not only approved GenAI's actual value in improving writing efficiency and quality, but also felt the strengthening of their sense of control and competence when facing writing tasks. Liu and Zhang (2025) further revealed the complexity and positive nature of this phenomenon through latent profile analysis. They identified four types of GenAI-assisted writing learner profiles, among which the "highly confident all-rounders" accounted for the highest proportion (about 47%). Learners in this group not only shown higher confidence in their ability to use GenAI to assist their academic writing, but also significant higher levels of self-regulating in academic writing. This indicated that that positive self-efficacy can form a mutually reinforcing virtuous cycle with strategy engagement. The findings of Meniado et al. (2024) among EFL learners in Thailand and Vietnam also verified these results. Students held overall positive attitudes toward ChatGPT-assisted writing (MEAN = 3.85), especially recognizing its support in the stages of idea generation and information gathering. Such recognition further consolidated their confidence in their own writing abilities.

Overall, the existing researches consistently indicates that GenAI can effectively enhance learners' affective engagement, self-efficacy, and intrinsic motivation in academic writing, and reduce writing anxiety. These positive affective and motivational outcomes not only improve learners' immediate writing experiences but also provide important psychological support for sustained writing engagement and strategy development. By creating a learning atmosphere characterized by lower anxiety and

greater confidence, GenAI constructs a more supportive writing environment for L2 learners, thereby fostering their positive development in the affective and motivational domains.

4.1.3 Theoretical Perspectives on GenAI assists English academic writing

The analysis identified several recurring theoretical perspectives across the reviewed studies, among which Self-Determination Theory (SDT), the Technology Acceptance Model (TAM), and Sociocultural Theory (SCT) emerged as particularly relevant frameworks for explaining learners' interactions with GenAI in English academic writing.

From theoretical perspective, the positive effects of GenAI on English academic writing performance can be explained through various theories such as Self-Determination Theory (SDT), Technology Acceptance Model (TAM), and Sociocultural Theory (SCT), since these theoretical perspectives may echo well with current empirical researches.

4.1.3.1 Self-Determination Theory

Self-Determination Theory emphasizes that when the learning environment satisfies learners' three basic psychological needs-autonomy, competence and relatedness, their intrinsic motivation is more likely to be inspired and sustained (Deci & Ryan, 2000). By providing real-time and personalized support, GenAI lowers down the cognitive and emotional barriers to writing tasks, which makes it easier for students to feel the sense of control and success.

The satisfaction of the need for autonomy is reflected in learners' sense of control over the writing process and their use of GenAI tools. Based on SDT and Complex Dynamic System Theory, Liu (2025) found in his research that adaptive learning pathways in AI-based gamified learning environment significantly increased learners' intrinsic motivation by allowing them to automatically choose the level of challenges. However, in conversational-agent contexts, learners' long-term motivation tended to decline as the novelty effect wore off when structured guidance was lacking, suggesting that autonomy support needs to be balanced with an appropriate degree of external regulation. This finding echoes Kim et al. (2024), who reported that Chinese postgraduates students expected GenAI tools to function as a "digital peer" that provides collaborative support rather than one-way instructions. Such perception of GenAI as an equal partner may itself contribute to learners' experience of autonomy.

The satisfaction of competence needs constitutes the core mechanism driving the affective effects of GenAI. By integrating AI tools with structured self-assessment, Heydarnejad (2025) observed a remarkable increase in self-perceived competence among participants in the experimental groups (with 23 of 30 attaining higher competence levels in post-intervention), yielding a synergistic effect size of Phi Cramer's V = 0.471–0.567. Cen and Shakibaei (2026) demonstrated further that intensive AI scaffolding mitigates cognitive load by offloading relatively low-level tasks. Consequently, learners are empowered to reallocate cognitive capacity toward higher-order conceptualization and creative ideas, thereby catalyzing an identity transition from "student" to "writer"—a shift that fundamentally signifies the internalization of writing competence into the self-concept. Offering cross-cultural validation, a mixed-methods investigation by Apriania et al. (2024) indicated that exposure to AI chatbots substantially enhanced both writing self-efficacy and self-regulatory capacity among Indonesian EFL learners, with qualitative findings highlighting that learners conceptualized immediate AI feedback as "tangible evidence of competence growth."

The satisfaction of relatedness in technological contexts seems complex. Teng (2026) found that GenAI feedback significantly outperformed peer feedback in terms of learners' sense of belonging, with its "safe harbor" effect prevents learners from the fear of social evaluation. However, such relatedness is "depersonalized" and may not fully replace the emotional bond afforded by authentic social interaction. A study by Fang et al. (2025) focusing on elementary school students showed that learners initially perceived GenAI merely as a tool, but after four weeks of interaction, they gradually constructed a relational perception of GenAI as a "creative partner," suggesting that the experience of relatedness may require a specific process of cognitive restructuring.

Overall, the SDT perspective reveals the underlying structure of GenAI's motivational effects: technology does not directly "provide" motivation; rather, it regulates the quality of motivation by supporting or threatening the satisfaction of basic psychological needs.

4.1.3.2 Technology Acceptance Model

Learners' affective and motivational responses may also be explained from traditional Technology Acceptance Model (TAM). Technology Acceptance Model, and its extended versions, UTAUT/UTAUT2, emphasize the decisive role of perceived usefulness, perceived ease of use and trust in shaping users' attitudes toward technology and behavioral intentions. Based on UTAUT model, Wang and Peng (2025) conducted a mixed-methods study with 154 Chinese postgraduate students majoring in foreign languages. They found that effort expectancy was a core predictor of attitudes, accounting for 44.5% of the keyword occurrences, while perceptions of AI's ease of use and continued use reinforced each other. Based on a two-dimensional matrix of "professional knowledge integration ability × technological application ability," they further identified four types of users:

collaborative innovators, technology-oriented users, professionally guided users, and novice explorers, revealing the heterogeneous structure of learners' affective attitudes toward GenAI.

Khoso et al. (2026) extended TAM by distinguishing trust into two dimensions: functionality trust and human-like trust. Based on a two-round survey of 1, 100 EFL students, they found that functionality trust had a stronger effect on behavioral intentions, whereas human-like trust played a more important role in shaping affective attitudes. Trust thus served as a "bridge" through which technology acceptance was transformed into creative learning outcomes. This finding has direct implications for GenAI assists English academic writing: if learners lack "human-like trust" in AI as a simulated reader, they may engage with it only superficially; if "functionality trust" is absent, they may not adopt AI-generated suggestions in the first place.

Qiu and Zhu (2026) applied the UTAUT2 model to predict postgraduate students' use of AI chatbots for academic writing. Their findings showed that behavioral intention (β = 0.577), facilitating conditions (β = 0.221), and habit (β = 0. 132) jointly explained 68.0% of the variance in actual usage behavior. However, performance expectancy and hedonic motivation, two classic TAM-related variables, did not significantly predict behavioral intention. This finding suggests that, in the high-stakes context of academic writing, affective and habitual drivers may go over purely rational cost–benefit calculations. Further, Falebita and Kok (2024), using a TAM-based structural equation modeling approach, demonstrated that technological readiness indirectly influenced AI tool use through the sequential mediation of self-efficacy and perceived ease of use, with attitude emerging as the primary determinant (β = 0.285). This pathway provides a more fine-grained model for understanding the mechanisms through which GenAI generates affective effects.

4.1.3.3 Sociocultural Theory

From the perspective of Sociocultural Theory (SCT), the affective and motivational effects of GenAI in English academic writing can be reconceptualized as a contemporary form of "mediated learning" . Vygotsky's concepts of the Zone of Proximal Development (ZPD) and scaffolding provide a classical framework for understanding the cognitive and affective functions of GenAI tools. Nguyen et al. (2024) explicitly drew on sociocultural theory and conceptualized ChatGPT as a "mediating tool" . They found that its scaffolded assistance during the pre-writing stage significantly enhanced learners' emotional engagement and writing performance, with emotional engagement positively correlated with writing achievement (rs = .301). The main contribution of this research is that it reveals the affective effect of GenAI is not only solely "emotional response", but rather mediated phenomena deeply embedded in the sociocultural reconstruction of writing activities: the process of expressing their needs to GenAI tools itself may deepen learners' metacognitive reflection on the writing process.

Yijen Wang (2024) further extended this analysis by integrating SCT with self-regulated learning theory and tracing the AI-use patterns of 79 Japanese EFL learners across four stages of academic writing: task defining, goal setting, execution, and adaptation. The study found that students who engaged in "dialogic interaction" with AI demonstrated stronger self-regulatory abilities, while their affective experiences gradually shifted from initial tool dependence toward critical regulation. Classroom environments and peer interaction, as sociocultural contextual factors, significantly moderated the extent to which AI scaffolding was internalized. Ghimire et al. (2024), although based on a small exploratory sample of three teachers, provided an important complementary perspective from teachers. Their findings suggest that GenAI can function as an alternative form of scaffolding provided by a "more knowledgeable other," supporting personalized learning and increasing the participation of shy students; however, its effectiveness is contingent upon teachers' guidance strategies and institutional frameworks.

Overall, existing research suggests that the effects of GenAI on L2 writing are not attributable to a single factor, but rather arise through multiple psychological and sociocognitive mechanisms. From the perspective of Self-Determination Theory (SDT), GenAI can support learners' basic psychological needs by providing personalized feedback, reducing writing anxiety, and enhancing perceived competence and autonomy, thereby promoting higher-quality motivation. From the perspective of the Technology Acceptance Model (TAM) and UTAUT/UTAUT2, perceived usefulness, ease of use, trust, behavioral intention, and habit jointly shape learners' acceptance and continued use of GenAI, which in turn influences their writing behaviors. From the perspective of Sociocultural Theory (SCT), GenAI functions as a mediating tool that participates in learners' writing activities by providing immediate and dynamic scaffolding, potentially facilitating metacognitive reflection and self-regulation. Accordingly, the studies by Nguyen et al. (2024), Yijen Wang (2024), Meniado et al. (2024), and Kim et al. (2025) provide empirical support for these theoretical mechanisms from different perspectives. However, these theoretical perspectives also suggest that the positive effects of GenAI do not necessarily translate into sustained development of learners' independent writing abilities. When the need support, convenience, and external scaffolding provided by the technology gradually develop into over-reliance, learners' autonomy, self-regulation, and capacity for independent problem solving may instead be undermined.

4.2 RQ2: challenges of implementing GenAI in English academic writing

Just as an old saying goes: every coin has two sides. GenAI has shown great potential in English academic writing, and work effectively in improving writing efficiency, optimizing expressions, brainstorming ideas and providing real-time feedback. However, even though GenAI has been applied widely in education, and a great number of researches have focused on its positive effects, its negative effects can never be neglected. With the wide application of GenAI into English academic writing, more and more researches have also started focusing on the potential challenges associated with its use.

4.2.1 GenAI reliance issues

GenAI reliance refers to situations in which individuals rely excessively on GenAI tools for decision-making or task completion while neglecting their own judgment and autonomy (Zhang et al., 2024). Previous studies suggest that such reliance may arise from individuals' difficulty in evaluating the reliability of GenAI outputs and determining appropriate levels of trust in these tools (Klingbeil et al., 2024; Abubakar et al, 2025). As a result, GenAI-generated content may be treated as an authoritative source, potentially eroding users' cognitive autonomy and independent problem-solving abilities (Zhai et al., 2024).

Previous researches have shown that relying excessively on GenAI may affect their writing abilities negatively. Hou et al. (2025) found that trust in GenAI in anyway may predict thoughtless use positively, thus accepting GenAI-generated contents while lacking of critical assessment, which may directly lead to this kind of blind reliance, therefore undermining effective human-AI collaboration and shallowing their studies. Complementing this, Liu & Liu (2026) reported a significant positive association between perceived usefulness of GenAI for learning and GenAI dependency (total effect $\beta = 0.303$, $p < 0.001$), which was mediated by reduced metacognitive self-regulation and increased academic procrastination, with both indirect effects being statistically significant. If students rely excessively on GenAI to assist their learning, it may weaken their ability of self-monitoring, thus they'll delay completing the task and forming a reliance cycle, therefore affect negatively on their autonomous learning abilities and academic performance (Choudhuri, 2026; Hou et al., 2025).

Relying excessively on GenAI may also diminish learners' critical thinking abilities. This reliance may cause learners gradually reduce deep cognitive processing such as independent analysis, reflection and information assessment (Kyumana et al., 2025; Zafar et al., 2025), instead, they'll turn to the passive acceptance of GenAI-generated outputs, thus forming a kind of shallow learning mode (Toma & Yánez-Pérez, 2024; Gonzales et al., 2025). This kind of diminishing in critical thinking not only influence negatively on learners' problem-solving abilities, but also increases the risk of academic dishonesty, which may put learners in a more serious dilemma between GenAI assists writing and self-writing (Wang & Fan, 2025; Taufikin et al., 2025). In long run, this kind of cognitive reliance cycle may lead learners to gradually lose their active engagement with language or writing policies, thus influencing their self-writing abilities and long-term language development (Chen et al., 2025).

4.2.2 Academic Integrity and Authorial Identity Issues

Even though GenAI acts as an extremely powerful "writing assistant", previous researches have shown that relying excessively on the contents generated by GenAI may weaken students' ability of independent constructing, critical thinking and problem solving, thus transforming the writing process from active knowledge construction into the acceptance and integration of GenAI-generated outcomes (Warschauer et al., 2023). On the other hand, learners may gradually reduce their active use of language and writing strategies, thereby undermining their writing skills and long-term language development (Aljuaid, 2024). Moreover, relying excessively on GenAI may trigger a series of ethical problems such as academic integrity issues, learner identity crisis and responsibility attribution (Mhlanga, 2024; ,Olaseinde & Azeez, 2022; Nguyen, 2025), thus presenting the learner in a dilemma between GenAI assists writing and self-writing(Rasul et al., 2024).

Firstly, relying excessively on GenAI may make learners' authorial identity blurry. Traditional academic writing focuses more on the writer's original thinking and contributions (Elbow, 1998). However, they may find it difficult to delineate their own role in the text when they rely excessively on the contents generated by GenAI, since their fluency and professionalism may create an illusion among learners that "this is my own work", while neglecting the dominant role GenAI plays in knowledge constructing (Al-Sofi, 2024). This kind of academic blurry not only weakens learners' sense of authorship, but also lead to academic integrity issues (Darvin, 2025).

Besides, relying excessively on GenAI may directly trigger academic integrity issues. For example, students may submit GenAI-generated outputs as their own work while neglecting modification or critical review (Weber-Wulff et al., 2023; Dalalah & Dalalah, 2023), or fail to clearly point out the source when citing GenAI outputs, thus significantly increasing the risk of plagiarism or improper attribution (Maktabdar et al., 2025). Giray et al. (2025) pointed out that current GenAI writing detection tools suffer from high false-positive and false-negative rates, and shows bias against non-native English speakers, which makes it difficult to maintain academic integrity through detection tools barely, and instead, foster an atmosphere of distrust. Similarly, Perkins (2023) also pointed out that coherent text generated by GenAI often evades traditional text-matching software or human

scrutiny. If students don't transparently state their usage of GenAI in their texts, it may contribute to academic dishonesty or the violation of institutional honesty policies. These have shown that relying excessively on GenAI tools not only make learners' authorial identity blurry, but also challenged seriously to the traditional academic integrity.

4.2.3 Affective and Motivational Paradoxes

Taking a broader view from social and psychological perspective, relying more on GenAI tools may result in more serious negative effects, such as diminished learning motivation, limited creativity and heightened psychological reliance (Salah et al., 2024; Chen et al., 2026; Richmond & Nicholls, 2025). Self-efficacy has been identified as a key psychological factor which shapes learners' engagement with GenAI. Previous studies have indicated that learners with higher writing self-efficacy tend to use GenAI as "writing assistant" rather than relying on it directly (Fang et al., 2025; Kim et al., 2025). These learners are more likely to evaluate, modify, and integrate GenAI-generated suggestions into their own writing. However, learners with lower self-efficacy are more likely to directly adopt GenAI-generated content, which increases the risk of superficial learning and reliance (Hwang et al., 2025). This pattern suggests that self-efficacy may function as a protective factor against over-reliance.

Self-regulated learning ability is another important factor that influence learners' usage of GenAI in writing. Learners with strong metacognitive skills are better at planning, monitoring, and evaluating their writing processes, including their interactions with GenAI tools (Wu et al., 2026; Francis et al., 2025). These learners tend to critically assess the quality of GenAI outputs and revise the passage more often, which may directly lead to improved writing outcomes (Trinovita et al., 2025; Wu et al., 2025). Conversely, learners with weaker self-regulation may lack the ability to evaluate GenAI-generated content critically, which may result in over-reliance and limited learning gains Mahapatra, 2024; Liang et al., 2023).

4.2.4 Individual Vulnerability: The Moderating Role of AI Literacy

Besides, previous researches also have shown that relying excessively on GenAI may affect negatively on learners' general writing literacy and educational fairness (Amyatun & .Kholis, 2023). As students rely more on GenAI tools to generate the structure, argument and expression of their passage, they experience a significant decrease in opportunities to practise traditional writing skills (Lee et al., 2025), which may directly lead to the degradation of lexical flexibility, logical coherence in argumentation and textual originality (Suciati et al., 2026; Qazi et al., 2025; Gao et al., 2025). This kind of skill degradation not only limit their ability of expressing their opinions in their writing, but also give a sense of uncertainty and maladaptation when GenAI tools are removed (Xu et al., 2026; Lademann et al., 2025). At the same time, since students may vary in access to GenAI tools, levels of digital literacy, and availability of instructional support may widen the educational inequalities (Deep et al., 2025; Hawanti et al., 2023), which may make the learners who are at lower level of writing rely more on GenAI tools, thus making it hard to improve their skills.

In addition, technological readiness and AI literacy have also been identified to influence learners' interaction with GenAI. Students with higher levels of AI literacy are more likely to engage in multi-round interactions, using GenAI strategically to refine their ideas and language (Bozkurt, 2024; Liu et al., 2025). In contrast, learners with lower AI literacy tend to adopt a "direct substitution" mode, treating GAI as a replacement for their own writing efforts (O'Dea et al., 2026). These findings indicate that AI literacy plays a crucial role in shaping the quality of learner–GenAI interaction.

4.3 RQ3: emerging gaps and insights for future research

Even though there's a rapid growth of research concerning the usage of GenAI in English academic writing, several research gaps still remain. Current researches mainly focus on short-term effects, the perception of students and real-time writing outcomes (Yan, 2023; Meniado et al., 2024; Wang, 2025), while longitudinal researches examined how GenAI reliance may reshape critical thinking, self-regulate learning strategies and long-term language development are still limited (Zhai et al., 2024; Choudhuri et al., 2026). Most empirical researches only remain cross-sectional or exploratory, which may limit our understanding of cumulative cognitive and motivational consequences of routine GenAI use.

Secondly, the measurement and conceptualization of GenAI reliance itself is still limited. Though recent researches started focusing on academic self-efficacy, the trust on GenAI or GenAI reliance (Zhang et al., 2024; Hou et al., 2025; Liu & Liu, 2026), instruments such as scales or questionnaires that are specifically designed for English academic writing are still limited (Liu & Zhang, 2025; Zhang et al., 2024). Future researches should develop and justify the specific scales for this era, in order to capture different kinds of reliance such as reflective reliance, cautious reliance or brainless reliance. At the same time, future researches should also capture the relationship between GenAI reliance and writing processes and products.

Thirdly, a pervasive methodological limitation in extant GenAI assists English academic writing research lies in the short-term nature of intervention designs, which constrains our understanding of how technology-mediated effects become internalized. Scrutiny of the literature reveals that the vast majority of quasi-experimental studies cluster within a 2- to 10-week intervention

(Wang et al., 2024; Nguyen et al., 2024; Heydarnejad, 2025). While such designs effectively capture immediate treatment effects, they fail to address a fundamental developmental question: When does AI-assisted writing strategy become internalized, and does autonomous deployment of such strategies persist after internalization? Mahapatra (2024) attempted to overcome this limitation by incorporating a delayed post-test approximately two months following a six-hour instructional intervention, finding that the experimental group maintained significantly superior writing performance (delayed post-test M = 20.419 vs. control M = 15.400). However, this delayed assessment still operated under conditions of continued AI availability, lacking examination of performance maintenance after "AI withdrawal." Consequently, the study could not disentangle genuine skill internalization from psychological dependence on persistent tool accessibility.

Fourthly, fairness and contextual diversity also deserve more attention. Currently most researches draw from evidence from specific institutions or national settings. Besides, the researches often focus on relatively homogeneous groups of university students in particular regions. Therefore, we still know little about how rely excessively on GenAI and its cognitive, linguistic and ethical consequences may vary across different education systems, socioeconomic backgrounds and cultural contexts. Access to GenAI tools, levels of digital literacy, quality of educational support and institutional policies may all vary, therefore contribute more seriously to current inequality in education. Learners from resource-limited areas or at lower level of digital literacy may become more vulnerable to uncritically excessive reliance on GenAI, while more privileged students may develop more sophisticated, reflective strategies of GenAI usage strategies. Therefore, comparative studies across different different education systems, socioeconomic backgrounds and cultural contexts are urgently needed to understand deeply about how these moderating factors may contribute to excessive GenAI reliance or education inequality (Meniado et al., 2024; Wang, 2025; Xiao et al., 2026). This kind of research may provide a more detailed and rosy foundation for developing equitable pedagogical and policy responses.

5 Conclusion

This review examined the applications, challenges, and research gaps associated with GenAI in English academic writing. The literature suggests that GenAI can support planning, drafting, and revision through idea generation, language assistance, and feedback. Some studies also report favorable learner perceptions and motivational outcomes. However, these benefits should be interpreted in relation to research design, writing context, and assessment conditions.

A central implication is that improvements in AI-assisted texts should be distinguished from the development of independent writing skills. Instruction should encourage learners to evaluate and revise AI-generated suggestions while retaining responsibility for their arguments and textual decisions. Future research should assess both assisted and unaided writing performance over time and examine how learner characteristics and instructional guidance shape productive use and problematic reliance.

6 Limitations

This review has several limitations. First, study selection and coding were conducted by a single reviewer, which may have introduced selection and interpretation bias. Second, the search covered four literature sources and applied English-language eligibility criteria, potentially excluding relevant evidence. Third, differences in participant characteristics, writing tasks, GenAI tools, and research designs limit direct comparisons across studies and the generalizability of the synthesis. Besides, evidence based on self-reported perceptions, short-term interventions, or AI-assisted writing products cannot, by itself, demonstrate sustained gains in independent writing ability. These limitations should be considered when interpreting the findings and their pedagogical implications.

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