

Effect of GenAI on EFL Learners' Engagement and Motivation: A Systematic Review

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How To Cite: Liu, Y., & Sun, Y. (2026). Effect of GenAI on EFL Learners' Engagement and Motivation: A Systematic Review. *Studies of Applied Linguistics in Asia*, 1(1), 147–159. <https://doi.org/10.53941/sala.2026.100013>

Received: 6 March 2026

Revised: 17 August 2026

Accepted: 19 August 2026

Published: 18 September 2026

Abstract: The integration of generative artificial intelligence (GenAI) in English as a foreign language (EFL) learning and teaching has attracted considerable research attention. However, few reviews focused on the impact of GenAI on learners' engagement and motivation, a crucial aspect of language learning. Therefore, this systematic review addresses this gap by examining 21 empirical studies published between January 2023 and July 2025, focusing on research design, research focus, and the roles and affecting factors of GenAI in EFL learning. Findings show an unbalanced distribution in research setting, educational level, intervention duration, GenAI tools, research method, data source and learning subjects. Tertiary education in China is the dominant setting. Most studies employed ChatGPT with short-term and intermediate-term intervention. Research data mainly came from questionnaires and interviews, and a mixed method design was adopted in most studies. The primary focus of the reviewed studies is writing skills, with a few examining other skills such as speaking and reading. GenAI played four roles in enhancing students' engagement and motivation, namely, evaluator, resource provider, feedback provider, and conversation partner. The review suggests that future research can extend to secondary education, diversify the research tools and focus, and employ longitudinal studies.

Keywords: GenAI; English as a foreign language; learner engagement; motivation

1. Introduction

Over the past few years, the emergence of generative artificial intelligence (GenAI) has spurred attempts to integrate these GenAI tools in English as a foreign language (EFL) learning and teaching, marking a significant shift in language education. Both motivation and engagement have been proved to have salient impacts on learners' academic achievements in EFL context (Ryan & Deci, 2000; Fredricks et al., 2004). With proper application, GenAI can improve EFL learners' engagement and motivation by providing personalized language learning experiences (Bai et al., 2024; Guan et al., 2024). Recent reviews have explored the affordances and application of GenAI in language education (Law, 2024; Lee et al., 2025; Li et al., 2024; Liang et al., 2023). However, there is a lack of reviews focusing on EFL

learners and their experiences, which limits our understanding of GenAI's pedagogical impact. This systematic review addresses this gap by focusing on application of GenAI in EFL teaching and learning, aiming to clarify how the usage of GenAI impact learners' engagement and motivation.

GenAI has generated substantial interest in the field of language education regarding its pedagogical affordances, especially in the EFL context (Chiu, 2024; Karataş et al., 2024; Lee et al., 2025). With its advanced capabilities for human-like interaction beyond previous AI chatbots, LLM-based GenAI enables learners to generate coherent and contextually appropriate interactions to their queries, providing them with an effective resource for their learning experiences (Chiu, 2024; Huang et al., 2022; Abbas et al., 2024; Zhang, Q., et al., 2025). GenAI has shown the potential to support



language acquisition through immediate feedback and personalized instruction across different levels (Pan et al., 2025; Tai & Chen, 2024; Behforouz & Al Ghaithi, 2024). When integrated into language learning activities, GenAI tools can improve multiple language skills, such as writing (Guo & Li, 2024; Song & Song, 2023), speaking (Chen et al., 2025), reading (Pan et al., 2025) and listening (Liu & Reinders, 2025).

In addition to its potential for improving language skills, the application of GenAI in language education has attracted considerable attention for its multifaceted benefits, including reducing anxiety, enhancing learners' engagement, and optimizing assessment practices (Tan et al., 2025). Unlike traditional AI tools, GenAI tools provide personalized and interactive learning environments that foster active interaction and proactive learning, ultimately promoting learner engagement in EFL education (Khoso et al., 2025; Yuan & Liu, 2025). Drawing on the multidimensional framework of learner engagement proposed by Fredricks et al. (2004), researchers have explored the impact of GenAI on various aspects of EFL learning, including vocabulary acquisition, writing, and speaking (Nguyen et al., 2025; Khoso et al., 2025; Guo & Li, 2024). Interactions with GenAI elicit EFL learners' engagement in multiple dimensions, thereby positively influencing their learning outcomes. Given the advantages of GenAI feedback in enhancing emotional and behavioral engagement, scholars have developed scales to assess GenAI-mediated learner engagement (Teng & Huang, 2026; Yao et al., 2026). Other researchers have examined the roles of self-regulated learning, teacher scaffolding, and peer collaboration in shaping engagement during interactions with GenAI (Liu et al., 2026; Shi & Sun, 2026). These studies represent a shift from merely validating the effectiveness of GenAI to conducting multidimensional analyses of learners' behavioral, emotional, and cognitive engagement, while also accounting for the interplay of diverse influencing factors.

In research on GenAI-facilitated language acquisition, learning motivation has been identified as both a key outcome and a critical variable influencing learners' academic achievements (Wu & Yu, 2024; Huang et al., 2023). Studies have demonstrated that GenAI enhances EFL learners' motivation by providing instantaneous feedback, automated evaluation, and personalized learning experiences (Abdelhalim & Alsehibany, 2025; Chen et al., 2025; Song & Song, 2023; Chiu, 2024). More recent scholarship has shifted its focus toward the efficacy of GenAI on motivation in different language activities, including listening (Guan et al., 2024), speaking (Chen et al., 2025), and writing (Huang & Mizumoto, 2025). While existing research underscores GenAI's potential to stimulate writing interest and intrinsic motivation, it also highlights certain limitations, such as its varying impact on self-efficacy and the potential psychological risk of "upward comparison" with the AI (Aydemir Arslan et al.,

2026; Lu et al., 2026; Zhang, P., et al., 2026). These findings suggest that the impact of GenAI on motivation is not uniform but is mediated by individual learner characteristics, such as self-regulation abilities and motivation types.

Given the increasing application of GenAI in EFL education, reviews have been conducted on the effectiveness of GenAI in language learning and teaching. Existing reviews on the effects of GenAI mainly focus on GenAI-supported instruction and ethical implications for improving language learning and teaching. For instance, Lee et al. (2025) reviewed the application of GenAI in language classroom context in 49 empirical studies. Similarly, Teng (2024) addressed effectiveness of ChatGPT in EFL writing instruction, and ethical concerns in 20 empirical studies. In Feng et al.'s (2025) review, 112 studies on AI-integrated L2 writing published between 2014 and 2024 were examined. The review not only revealed the current situation of applying GenAI in EFL education but also some technological challenges, such as content quality and querying issues and concerns regarding academic integrity (Lee et al., 2025). While existing reviews have revealed the pedagogical applications and ethical concerns of GenAI in EFL education, critical dimensions such as learner psychology and behavior have been potentially overlooked. Considering the increasing research interest in the impact of GenAI on EFL learners' engagement and motivation, a lack of systematic reviews in this emerging field still remains.

To this end, the present study aims to systematically review the published research on the effects of GenAI on learners' engagement and motivation in EFL education. The review attempts to address the following questions:

RQ1: What are the research design and research focus of the studies on GenAI on EFL learners' engagement and motivation?

RQ2: What role does GenAI play in EFL learning, especially in affecting learners' engagement and motivation?

RQ3: How effective is GenAI on EFL learners' engagement and motivation?

RQ4: What factors may affect the impacts of GenAI on EFL learners' engagement and motivation?

2. Method

2.1. Searching and Selecting Articles

To conduct this systematic review, we followed the PRISMA framework (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) put forward by Page et al. (2021), as shown in Figure 1. The literature search was conducted on Web of Science focusing solely on journal articles on the effects of GenAI on learners' engagement and motivation in EFL education. Based on highly cited peer-reviewed research articles published in

this field, the following keyword string was used in the database: (((((((TS = (GenAI)) OR TS = ("generative artificial intelligence")) OR TS = ("generative AI")) OR TS = (ChatGPT)) AND TS = (motivation)) OR TS = (engagement)) AND TS = (EFL)) OR TS = ("English as a Foreign Language"). Considering that ChatGPT was first

released in November 2022 by OpenAI, the review covers journal articles published from 1 January 2023 to 1 July 2025, using "all field" as filtering criteria to search as many sources as possible. The search was undertaken on 20 July 2025, yielding 732 articles in total.

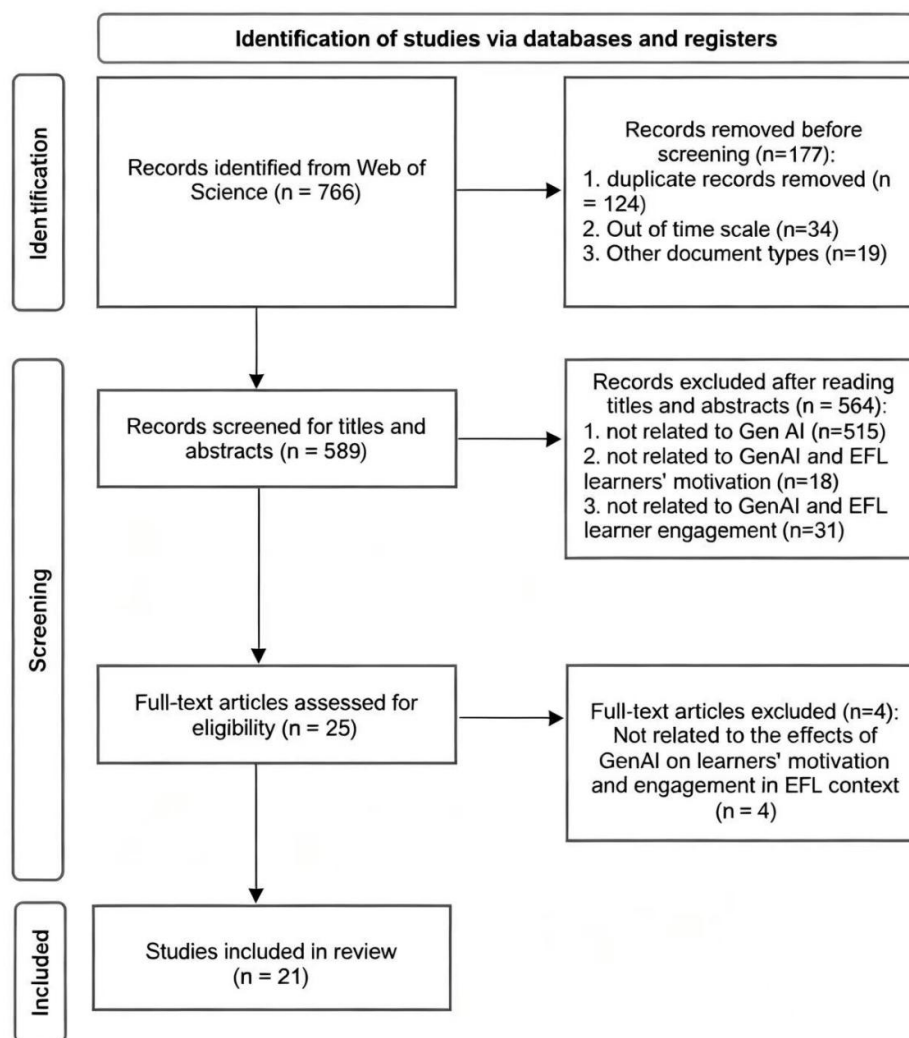


Figure 1. The PRISMA flow chart for literature search and selection.

Certain inclusion and exclusion criteria were then applied to ensure the relevance of the selected studies. In the initial identification stage, the search was limited to empirical studies published in English language in peer-reviewed journals. Theoretical analysis, literature reviews, publications in other languages, as well as other types of articles, such as conference papers and book chapters, were excluded. Consequently, 143 articles were removed, leaving 589 articles for further screening. In the next stage, the titles and abstracts of the articles were screened. Records were excluded if they were (1) not taking GenAI as independent variable ($n = 515$); (2) not taking EFL learners' motivation as dependent variable ($n = 18$); (3) not taking EFL learners' engagement as dependent variable ($n = 31$). This process resulted in the exclusion of 564 records and 25 articles remained. In the

final stage, the full texts of the 25 articles were assessed for their eligibility, and four additional articles were excluded due to the weak relevance to the topic (such as lack of empirical data and or focus on teacher education rather than student outcome). Ultimately, a sample of 21 articles were included in the final analysis. All the articles were published in SSCI-indexed journals, ensuring a high standard of methodological quality of the studies.

2.2. Coding Scheme

To analyze the selected studies and ensure the reliability of the findings, a coding scheme was developed with several categories and subcategories based on our research questions and previous reviews of GenAI and language education (shown in Table 1).

Table 1. Coding scheme.

Category	Subcategory	Reference
Research Setting	Countries	N/A
Education level	Elementary education Secondary education Tertiary education Adults	Lee et al. (2025)
Sample size	Small (S): ≤10 Medium (M): 11–30 Large (L): 31–100 Extra-large (XL): ≥101	Liang et al. (2023)
Method	Quantitative Qualitative Mixed-methods	Hung et al. (2018)
Intervention duration	One session Short-term: ≤10 weeks Intermediate-term: 11–16 weeks Long-term: >16 weeks Not specified	Liang et al. (2023)
Data source	Questionnaire Interview Observation Reflection paper Study log Learning artifacts	Law (2024)
GenAI tools	ChatGPT Duolingo Others Not specified	N/A
Learning subjects	Reading Writing Listening Speaking Grammar Vocabulary	Liu et al. (2024)
GenAI roles	Evaluator Interviewer Resource provider Feedback provider Conversation partner	Lee et al. (2025) Liu et al. (2024)
Learning outcomes	Enhancing learners' engagement and motivation in EFL context	N/A
Factors	Learner-oriented Teacher-oriented	N/A

N/A indicates that these subcategories were developed by the authors based on the 21 studies reviewed in this paper.

To address RQ1, this review firstly summarized the general characteristics of each study, including research setting, educational level (Lee et al., 2025), sample size (Liang et al., 2023), research method (Hung et al., 2018), data source (Law, 2024), intervention duration (Liang et al., 2023), and different types of GenAI tools, learning subjects (Liu et al., 2024). To answer RQ2, the roles of GenAI on learners' engagement and motivation in the EFL education context reported in each study have been identified, including evaluator, interviewer, resource provider, feedback provider and conversation partner (Lee et al., 2025; Liu et al., 2024). For RQ3, the learning outcomes were synthesized focusing on the effects of

GenAI on EFL learners' engagement and motivation. The establishment of this category and its subcategories is based entirely on the 21 articles reviewed in the present study. To address RQ4, factors that may influence the effects of GenAI on learners' engagement and motivation were identified. This category has two subcategories: learner-oriented and teacher-oriented. The subcategories were adjusted to better align with the content of the 21 reviewed articles. For example, "preschool or kindergarten" (Lee et al., 2025) was removed from the present study, while "reading" was added to the coding scheme.

All the 21 articles were coded by the two authors independently and the results showed a high level of agreement (0.95 calculated by Cohen's kappa). The discrepancies were solved by discussion between the two authors.

3. Results

3.1. Research Design

As illustrated in Figure 2, all the studies were conducted in Asia with most of the studies were conducted in China ($n = 16$). The remaining studies were conducted with EFL learners in Saudi Arabia, Iran, Japan, Turkey and Vietnam ($n = 5$). Moreover, tertiary education contexts were the most common educational level of the included studies ($n = 19$), with both undergraduates and postgraduates, as depicted in Figure 3. Only two extended their focus on non-tertiary settings. One targeted elementary education (Tai & Chen, 2024) and the other focused on secondary education (Woo et al., 2024). No studies have been conducted in the context of adult education.

As shown in Figure 4, the distribution of sample sizes across the included studies reveals a clear preference for larger samples. Ten studies include large samples (31–100 samples), seven studies use extra-large samples (101 or more), three studies employ medium-size samples (11–30), and one study includes small sample (less than 10). Most studies were conducted with more than 30 samples, which validates the statistical outcomes of empirical analyses and strengthens the reliability of the experiments. Figure 5 shows the distribution of intervention duration. Most studies were conducted over a short-term duration ($n = 8$), followed by one session and intermediate-term ($n = 6$ for each). In addition, one study did not report a specific intervention duration. Critically, no included study adopted a long-term intervention in their experiments.

Among the 21 studies, three research methods (i.e., quantitative method, qualitative method and mixed-method) have been adopted. As shown in Figure 6, 12 studies adopted mixed-method design, seven adopted quantitative methods and two studies adopted qualitative methods. Figure 7 shows the data sources in the 21 studies. Among quantitative investigations, questionnaires were the predominant data collection tool ($n = 16$), supplemented by various learning artifacts ($n = 10$). Interviews were often

used in mix-method and qualitative studies ($n = 10$). Two articles used reflection paper and two used study log and only one study used observation as the data source.

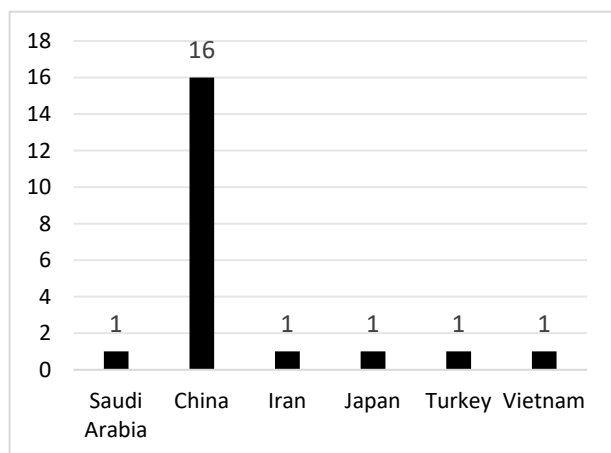


Figure 2. Research settings.

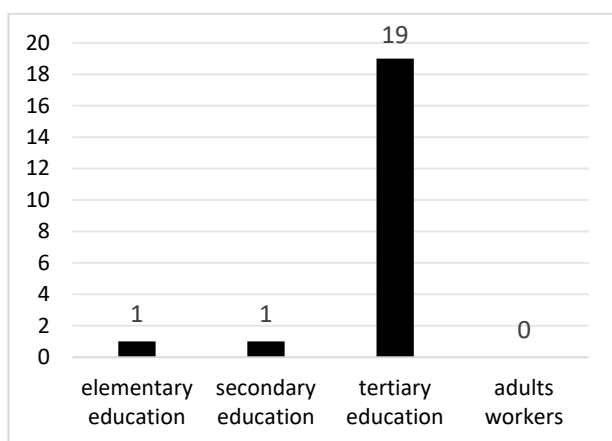


Figure 3. Education levels.

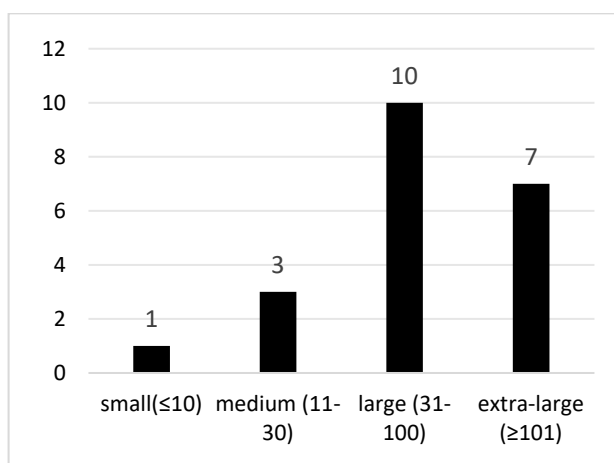


Figure 4. Sample size.

Figure 8 shows that most of the studies ($n = 13$) adopted ChatGPT as GenAI tool. By contrast, two studies incorporated Duolingo, a popular language learning platform. Four studies used other GenAI tools, such as Reade (Pan et al., 2025), self-made chatbots (Guo & Li, 2024), CoolE Bot (Tai & Chen, 2024), and TalkAI, SpeakG,

WenxinYiyan, XunfeiXinghuo in Wang and Xue's study (2024). In terms of target language skill, thirteen studies specify the skill (see Figure 9). Most of the included studies focused on writing skills ($n = 8$) and others focused on speaking ($n = 2$), listening ($n = 1$), vocabulary ($n = 1$) and reading ($n = 1$). Notably, no studies focused on grammar. One study addressed multiple language skills (Xu & Liu, 2025). However, eight articles did not specify language skills, for they examined the impact of GenAI in general English courses.

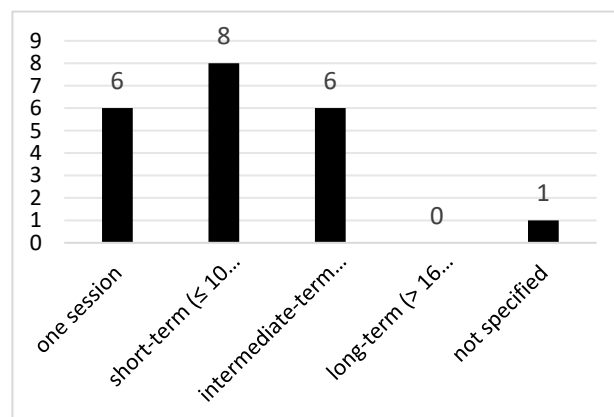


Figure 5. Intervention duration.

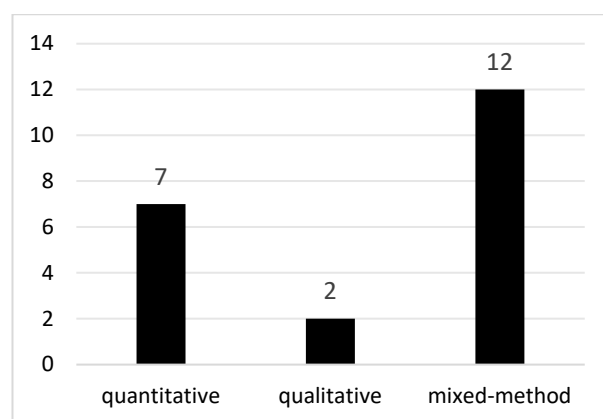


Figure 6. Research methods.

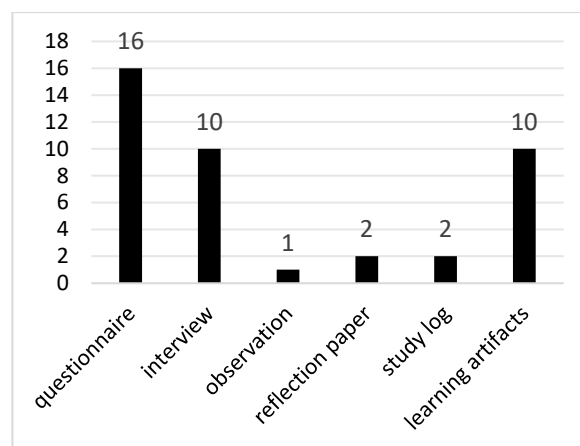


Figure 7. Data sources.

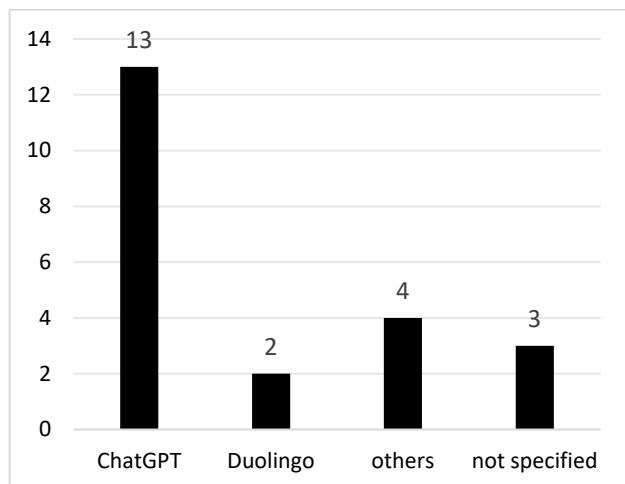


Figure 8. GenAI tools.

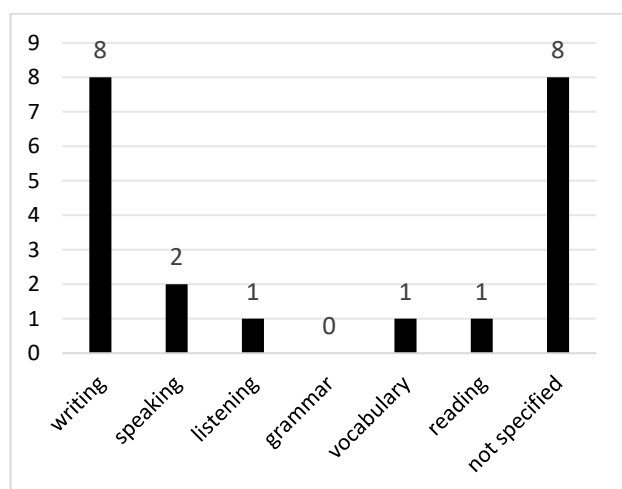


Figure 9. Language skill.

3.2. The Roles of GenAI

The roles of GenAI in the included studies have been reported, as they reflect its affordances to effect EFL learners' engagement and motivation. According to Lee et al. (2025) and Liu et al. (2024), GenAI plays five roles in language education, including evaluator, interviewer, resource provider, feedback provider, and conversation partner. As shown in Figure 10, the roles of evaluator ($n = 2$), resource provider ($n = 8$), feedback provider ($n = 7$) and conversation partner ($n = 5$) have been identified in the studies. Notably, some studies reported multiple roles of GenAI (e.g., Abdelhalim & Alsehibany, 2025). However, no studies have identified GenAI as an interviewer, and six studies did not specify the roles of GenAI. Therefore, four roles of GenAI tools in 15 studies are discussed here.

3.2.1. Resource Provider

Resource provider has been noted as the most common role in the included studies due to GenAI's

technical strength in human-like content generation ($n = 8$). As a resource provider, GenAI assisted EFL learners in providing various and contextual examples (Abdelhalim & Alsehibany, 2025; Chen et al. 2025), facilitating the generation and enrichment of ideas for writing and critical thinking tasks (Guo & Li, 2024; Nguyen et al., 2025), delivering targeted learning strategies and supplementary informational resources to address individual knowledge gaps (Pan et al., 2025; Wang & Xue, 2024; Woo et al., 2024), and providing specific learning materials individually (Xu & Liu, 2025).

3.2.2. Feedback Provider

As shown in Figure 10, feedback provider is the second common role of GenAI, with seven included studies identified this role. GenAI can provides personalized and real-time feedback or instruction when used in EFL teaching and learning, respectively in vocabulary, reading and writing courses. For vocabulary learning, integrated GenAI tools leverage real-time corrections and adaptive feedback when students interact with it (Abdelhalim & Alsehibany, 2025). In writing instruction, ChatGPT-supported teacher feedback can identify different errors and provide reasonable evaluations of the overall rhetorical structure (Han & Li, 2024). Similarly, in reading class, Pan et al. (2025) applied Reade, a GenAI-powered platform, to deliver personalized feedback and guidance on self-regulated learning.

3.2.3. Conversation Partner

Five studies have noted GenAI as a conversation partner, enabling human-like conversation with learners mainly in listening and speaking activities (Liu & Reinders, 2025; Tai & Chen, 2024). In addition, three studies examined GenAI as a conversation partner to provide additional and personalized learning information through voice interaction, mainly in vocabulary and writing practice (Abdelhalim & Alsehibany, 2025; Wang & Xue, 2024) and general English classes (Derakhshan, 2025).

3.2.4. Evaluator

Two studies were identified as applying GenAI tools as evaluators in speaking (Chen et al., 2025), and writing (Guo & Li, 2024). To assess the speaking performance affected by GenAI-mediated role-play activity, Chen et al. (2025) used GenAI to self-evaluate the similarity of the sentences generated by another GenAI tool to the original texts. In Guo and Li's (2024) study, a self-made GenAI tool was used as a personalized writing assistance tool to evaluate argumentative writing when learners made requests for assistance during the writing process.

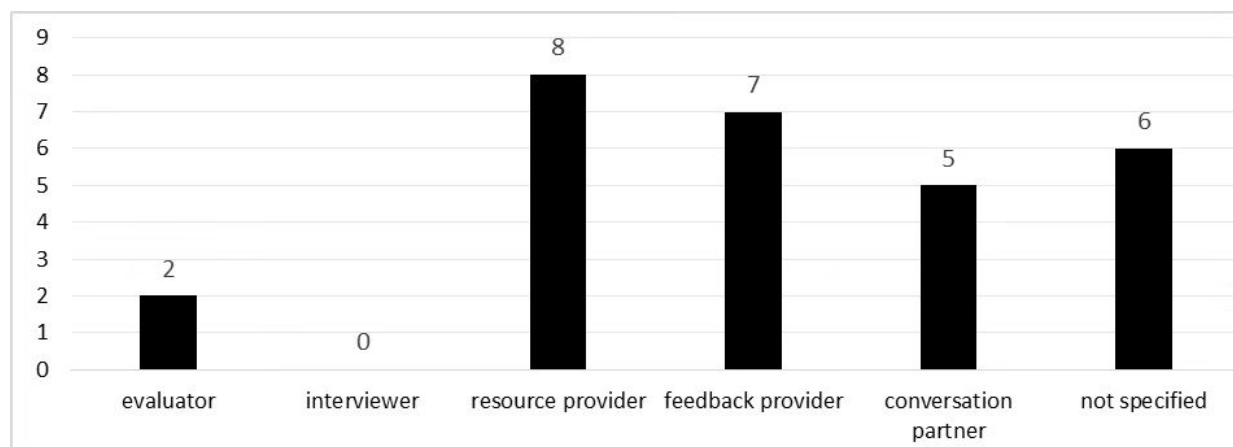


Figure 10. Roles of GenAI.

3.3. Learning Outcomes

In terms of the learning outcomes, all the selected articles showed that GenAI positively affects EFL learners' engagement and motivation through its advanced affordances. Among these 21 articles, eight studies found that GenAI could enhance EFL learners' engagement and its sub-dimensions. For example, the use of GenAI can enhance teacher-student relationships and fostering learners' emotional engagement (Derakhshan, 2025). It can also positively influence EFL learners' academic engagement by enabling interaction with AI models and offering authentic content, as well as personalized and immediate feedback (Khoso et al., 2025; Wang & Xue, 2024).

In terms of motivation, seven studies found that GenAI could improve EFL learners' motivation in different aspects, including writing (Guo & Li, 2024; Huang & Mizumoto, 2025; Song & Song, 2023; Woo et al., 2024), listening (Liu & Reinders, 2025), speaking (Chen et al., 2025) and general English learning (Xu & Liu, 2025). These studies revealed that EFL learners' motivation could be enhanced by personalized learning experiences and receiving immediate feedback, and by promoting autonomy and a sense of digital self-authenticity (Song & Song, 2023; Xu & Liu, 2025; Chen et al., 2025).

Six studies reported that GenAI could enhance both EFL learners' engagement and motivation with its human-like characters (Tai & Chen, 2024), and versatility and accessibility (Karataş et al., 2024). With these affordances, GenAI provides personalized learning experiences (Abdelhalim & Alsehibany, 2025), improving learners' autonomy and interaction with real-time feedback (Teng, 2024; Yuan & Liu, 2025), and boosting students' confidence and promoting a deeper flow experience during their learning activities (Yuan & Liu, 2025; Zhang, R., et al., 2025).

3.4. Affecting Factors

In addition to exploring the effect of GenAI on learners' engagement and motivation in the EFL context, this review also examined factors that may affect this

impact, which were reported in five studies. The factors can be divided into two categories: learner-oriented factors and teacher-oriented factors.

For learner-oriented factors, AI literacy and individual learners' needs have been found as the main factors (Huang & Mizumoto, 2025; Khoso et al., 2025; Liu & Reinders, 2025). AI literacy encompasses the competencies of using AI tools in an effective, meaningful, and contextually appropriate manner (Su et al., 2023). Lack of adequate knowledge of the potentials and limitations of GenAI may reduce the efficiency of GenAI-supported learning (Huang & Mizumoto, 2025). Khoso et al. (2025) further observed that students with limited AI literacy may lack proficiency in using ChatGPT, leading to less favorable effects on motivation and engagement than expected. In addition, Liu and Reinders (2025) highlights individual learners' initial motivation and needs constitute a critical learner-oriented factor influencing GenAI's effectiveness in EFL contexts.

As for the teacher-oriented factors, teacher mediation, AI literacy instruction, and scaffolding instruction have been identified as salient variables in supporting the effective integration and impact of GenAI in EFL teaching and learning (Abdelhalim & Alsehibany, 2025; Woo et al., 2024). These factors further align with Vygotsky's (1978) view on mediation and scaffolding from the sociocultural perspective, which emphasizes the role of external guidance in facilitating learning. GenAI tools should be complemented by structured external guidance from human teachers to ensure that technology is leveraged purposefully and critically (Abdelhalim & Alsehibany, 2025; Arifin et al., 2025).

4. Discussion

This review examined the application of GenAI on learners' engagement and motivation in the EFL context across 21 included studies, mainly focusing on the characteristics of research design and the roles of GenAI, the effectiveness of GenAI on learners' engagement and motivation, and the influenced factors.

Regarding the characteristics of research design and research focus, the geographic distribution of the reviewed studies aligns with previous findings that studies of AI in language education are mostly conducted in China (Liu et al., 2024; Lee et al., 2025). This is consistent with the rising of GenAI-assisted education and the higher demand for EFL learning and teaching in Asia and China (Liu et al., 2024). In particular, this concentration can be largely accounted by the policy support in China. Starting in 2024, the Ministry of Education (MOE) in China announced the implementation of the “AI-Empowered Education Action Plan”, which aims to promote the integration of AI in teaching and learning, and to enhance the digital literacy of the entire population. MOE further issued the “AI+Education” Action Plan in 2026. With the policy support from the government, it is foreseeable that this line of research will continue to grow in China. The imbalanced geographical distribution highlights a notable gap in global research attention toward GenAI applications in EFL teaching and learning. For example, empirical research in some Middle Eastern and Southern European countries is limited by obstacles such as teachers’ lack of readiness for GenAI, economic constraints, and weak infrastructure in these areas (Ghiasvand et al., 2024; Ghiasvand et al., 2026).

Regarding the educational level, most studies were conducted in the setting of tertiary education, with only two studies set in elementary and secondary education. This is consistent with the review by Law (2024) and Lai & Lee (2024). Three reasons can account for the limitation. Firstly, compared with college students, elementary and secondary students have limited access to smart phones and computers. The second reason is the convenience of data collection as most researchers are affiliated to universities and colleges and they often collect samples from their own institutions. Thirdly, as elementary and middle school education emphasized more on developing foundational language skills, interpersonal interaction, and hands-on experiences, integrating GenAI safely and effectively into classrooms at this stage requires far more careful consideration.

Furthermore, the intervention duration is predominantly short-term or limited to a single session, with no long-term studies. As none of the reviewed studies was conducted beyond a period of 16 weeks, critical gaps persist in our understanding of two key dimensions: long-term impacts of GenAI on learners’ engagement and motivation, and shifts in learners’ usage patterns (Lee et al., 2025). As noted by Fryer et al. (2017), learners’ interest in tasks involving interactions with Chatbot declined significantly after the first interaction. Pedagogical novelty was also the primary predictor of GenAI adoption behavior and habit formation (Zou et al., 2026). Zhang, D. W., et al. (2026) further demonstrated that the benefits of using ChatGPT are not immediately observable; instead, they tend to manifest later in an

extended learning process. Therefore, the lack of attention on the novelty effect has led to a gap in research regarding changes in learners’ engagement and motivation during the long-term use of GenAI tools.

This review indicates the need for more diverse research methods and data sources. The limited use of qualitative methods and the self-reported data sources also restrict knowledge of authentic practices with pedagogical application of GenAI tools in EFL education. Moreover, the analysis of the GenAI tools employed in the reviewed studies reveals that ChatGPT dominates the research landscape, yet a substantial proportion of these studies failed to specify the model version. This may impede the replicability of empirical findings and complicates systematic cross-study comparisons, considering the significant affordances discrepancy among different versions of ChatGPT. Obaidoon & Wei (2024) have compared the effectiveness of various GenAI tools (e.g., ChatGPT, Bart, Bing Chat and Claude) in Chinese as a Foreign Language (CFL) education and found that these tools play different roles due to the variations in their performance. The over-reliance on ChatGPT and overlook of other GenAI tools could negatively influence the application of GenAI in EFL language teaching and learning (Li et al., 2024). From the perspective of learning subjects, writing is the primary focus in most of these studies, which aligns with Lee et al.’s (2025) review. Different aspects in writing instruction were examined, involving logic learning (Zhang, R., et al., 2025), feedback provision (Huang & Mizumoto, 2025), revision and uptake (Boudouaia et al., 2024), and writing assistance (Guo & Li, 2024). This echoes the growing interests in using GenAI to complement the learning of writing due to its text-based nature and methodological convenience associated with assessing writing outcomes through automated textual analysis (Li et al., 2024; Liu et al., 2024). The results also suggest a research gap in understanding the effectiveness of GenAI on other learning subjects, such as speaking, listening, and reading skills.

Four roles of GenAI in the selected studies have been identified, including resource provider, evaluator, feedback provider and conversation partner. Among them, GenAI was most widely used as a resource provider to support language learning. This result aligns with Liu et al. (2024), who highlighted the crucial role of AI-based conversational chatbots in EFL learning. As a feedback provider, GenAI tools were mostly adopted in writing activities to explore its effects on learners’ writing performance and learners’ engagement and motivation (Han & Li, 2024; Huang & Mizumoto, 2025; Song & Song, 2023; Teng, 2024). In addition, GenAI also functions as a conversational partner, drawing on its natural language processing capability to answer questions, provide suggestions and generate ideas (Ghafouri, 2024). When adopted as an evaluator, GenAI was mainly used to assess its self-generated material (Chen et al., 2025) and

students' learning artifacts (Guo & Li, 2024), which validates the quality of learning materials and learning outcomes. These roles highlight the potential of GenAI in EFL education to improve engagement and motivation.

In terms of learning outcomes, all the reviewed studies reported a positive impact of GenAI on EFL learners' engagement and motivation, both of which are widely acknowledged as critical determinants of language learning. According to Self-Determination Theory (SDT), humans are born with three universal, innate psychological needs, including competence, relatedness, and autonomy (Ryan & Deci, 2000). Competence refers to the feeling that one can interact effectively with one's environment and achieve desired outcomes. Relatedness refers to the feeling of meaningful connection and care from others. Autonomy refers to the feeling that one's actions are voluntary and self-directed. In EFL education, GenAI tools usually act as resource provider and feedback provider. The human-like interaction style and instant feedback provided by GenAI help learners experience frequent success in their tasks, thereby enhancing their competence and relatedness. At the same time, learners can choose for themselves how to use GenAI, thereby increasing their autonomy. The effectiveness of GenAI in EFL education has been influenced by two main categories of factors: learner-oriented and teacher-oriented. However, further research is needed to examine additional contributing factors to help educators to select and combine GenAI tools to maximize potential benefits. For example, factors such as gender, multimodal texts, and voice can have different impact on the effectiveness of GenAI on EFL learners' engagement and motivation (Xiong & Teo, 2025; Huang et al., 2025).

5. Directions for Future Research

Based on the review, a few future research directions can be identified. Firstly, future research should adopt more diverse designs and expand geographical and contextual coverage to enhance the generalizability of findings, as EFL contexts vary across regions. Both quantitative and qualitative approaches should be balanced, incorporating multimodal data such as digital portfolios, discussion transcripts, and classroom observations to capture dynamic learner interaction. Efforts can be made to explore how GenAI interacts with different cultural and educational backgrounds, including its impact on younger learners at primary and secondary levels, who differ in digital literacy and proficiency. Longitudinal research beyond 16 weeks is necessary to assess GenAI's long-term effects on learner engagement and motivation. While most current studies focus on ChatGPT, other GenAI tools warrant investigation to understand their affordances. Comparative studies on ChatGPT versions are also needed. Finally, future research should explore GenAI's application in less-studied areas of

language learning, such as listening and speaking, to enhance holistic language development.

Secondly, our findings have identified four roles of GenAI in the EFL context, namely, evaluator, resource provider, feedback provider and conversation partner. More multifaceted roles of GenAI can be explored to fully understand the affordances of GenAI, such as synthesizer and trainer (Irwin & Muller, 2026). One limitation is that the short-term intervention duration limited the longitudinal evaluation of these roles, failing to capture how these roles evolve alongside learners' engagement and motivation. Another limitation is that studies often examine GenAI's roles in isolation, overlooking potential interactions, such as tensions between GenAI's feedback and assessment functions. In addition, when GenAI tools are adopted as conversation partners, the interactions are often structured around pre-specified tasks, leaving more spontaneous or open-ended communication largely underexplored. Lastly, the feedback provided by GenAI tools is often limited to error identification and correction. It is necessary to understand how feedback can foster engagement and motivation by prompting learners to reflect on their errors, rather than merely correcting them.

Thirdly, attempts can be made to explore the dynamic and reciprocal relationship between engagement and motivation with the application of GenAI tools. It is necessary to draw on theoretical frameworks such as SDT (Ryan & Deci, 2000) to explain how GenAI satisfies learners' basic psychological needs as a crucial mechanism to link motivation and engagement. The affecting factors summarized in this review were all related to human. Other factors can be explored to improve the efficiency of GenAI usage in EFL learning and teaching. For example, Feng et al. (2025) revealed textual factors and contextual factors in the use of AI, including the accuracy and explicitness of GenAI-generated content and institutional culture. Lee et al. (2025) reported factors related to ethical issues might give educators a more comprehensive guidance in EFL teaching and learning. These factors may interact with individual factors and further influence learners' perception of GenAI, which is a key factor for effective GenAI use (Abdelhalim, 2024).

6. Conclusions

This article presents a systematic review on the effects of GenAI on EFL learners' engagement and motivation with 21 selected articles published between 1 January 2023 and 1 July 2025. This review illuminates the characteristics of existing research from multiple aspects, including research design and research focus, GenAI roles, the effectiveness of GenAI on learners' engagement and motivation, and the influenced factors. These insights offer implications for optimizing the integration of GenAI to enhance EFL educational practices and provide suggestions for future research.

This review offers several pedagogical implications for teachers and policymakers. Firstly, teachers should cultivate students' AI literacy, particularly their ability to critically evaluate GenAI outputs, to help students transition from passive recipients to active collaborators. Secondly, a blended learning approach is recommended to help students leverage GenAI's advantages, while maintaining the irreplaceable role of teachers in students' cognitive and emotional development. Thirdly, the integration of GenAI should allow personalized teaching methods to address individual differences in motivation and engagement. For policymakers, priority should be given to professional development programs that equip educators with the technical skills and pedagogical knowledge necessary for effective GenAI integration. Furthermore, clear institutional guidelines are needed to formally incorporate AI literacy and critical thinking into the curriculum.

Despite these important findings and implications, several limitations of this systematic review should be acknowledged. Firstly, only articles within Web of Science database were included in this review; relevant studies published in other sources and databases may have been excluded. Secondly, the exclusion of other types of articles, including conference proceedings and book chapters, may restrict the scope of this review and potentially undermine the findings. Thirdly, this review focus on EFL learners, which may limit the generalizability to broader educational context in second language acquisition (SLA). These limitations should be considered when analysing the results of this systematic review. They emphasized the need for future reviews to incorporate a more diverse range of sources and contexts to ensure a more holistic understanding of the topic.

Author Contributions

Y.L.: writing—reviewing and editing, methodology, supervision, validation; Y.S.: writing—original draft preparation, visualization, methodology, data curation. All authors have read and agreed to the published version of the manuscript.

Funding

This research received no external funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Data and materials collected in this study are available upon reasonable request.

Conflicts of Interest

The authors declare no conflict of interest.

Use of AI and AI-Assisted Technologies

No AI tools were utilized for this paper.

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