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Research Article

Emotional Dimensions of AI-Assisted ESL/EFL Learning: A Systematic Review of Evidence, Research Trends, and Educational Implications

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Abstract:

Background: Artificial intelligence (AI) has rapidly transformed English language education, yet systematic evidence concerning its influence on learners' emotional experiences remains fragmented. Existing reviews have primarily emphasized language achievement, specific AI applications, or individual affective constructs.
Aims: This systematic review synthesizes empirical evidence on learner emotions in AI-assisted English as a Second Language (ESL) and English as Foreign Language (EFL) learning, focusing on research characteristics, emotional constructs, and reported affective outcomes.
Methods: Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, systematic searches were conducted in Scopus, Web of Science, OpenGrey, and Google Scholar. After applying predefined eligibility and quality-assessment criteria, 39 empirical studies, including 35 peer-reviewed publications and four grey-literature sources, were included in the qualitative synthesis.
Results: The findings indicate that AI-assisted ESL/EFL learning has been implemented across diverse educational settings, language skills, and AI applications across more than ten non-English-speaking countries. The evidence addressed a range of emotional and affective constructs, including foreign language enjoyment, anxiety, boredom, interest, engagement, confidence, well-being, and emotion regulation. Overall, AI-assisted learning was generally associated with more positive emotional experiences and reduced anxiety, although concerns regarding AI-related anxiety, dependence, reliability, and ethical issues were also reported.
Conclusion: The findings indicate that AI-assisted ESL/EFL learning has important affective as well as pedagogical dimensions. Future research should adopt more rigorous and diverse designs to clarify the conditions under which AI can support learners' emotional well-being alongside language development.

Keywords: Artificial Intelligence, ESL/EFL Learners, English Language Instruction, Systematic Review

1. INTRODUCTION

Emotions play a central role in second language acquisition because they shape learners' motivation, engagement, confidence, participation, and academic performance (Dewaele et al., 2019; Yang et al., 2025). Language learning is therefore not exclusively a cognitive or linguistic process; it is also an affective experience in which learners' emotional states can facilitate or constrain their engagement with instructional activities (Isaee & Barjesteh, 2025).

Positive emotions such as enjoyment, interest, confidence, and well-being may encourage learners to participate actively and persist in learning, whereas negative emotions such as anxiety and boredom can interfere with communication, engagement, and language development. Understanding learner emotions is consequently essential for evaluating contemporary approaches to English as a Second Language (ESL) and English as a Foreign Language (EFL) education.

At the same time, artificial intelligence (AI) has become increasingly integrated into language education (Isaee & Barjesteh, 2026b). AI-powered applications, including intelligent tutoring systems, conversational chatbots, automated writing-feedback tools, AI-supported assessment systems, and generative AI applications such as ChatGPT, provide learners with opportunities for personalized practice, immediate feedback, interactive communication, and flexible access to learning support. Recent research and reviews have reported potential benefits of these technologies for language achievement, engagement, motivation, and learner autonomy, while also identifying concerns related to privacy, ethical use, information accuracy,

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and excessive dependence on AI (Derakhshan, 2025; Li et al., 2024; Luo & Zou, 2024; C. Wang, Wang, et al., 2025; Xin & Derakhshan, 2025; S. Zhang & Liu, 2025). These developments suggest that the educational significance of AI cannot be adequately evaluated through language achievement alone. The emotional experiences generated within AI-assisted learning environments also require systematic attention.

The growing importance of this issue is reflected in the expanding review literature on AI in language education. Previous reviews have examined ChatGPT integration, AI chatbots, writing instruction, vocabulary learning, language achievement, learner motivation, and broader patterns of AI adoption in language education. Collectively, these reviews provide important evidence that AI can support language learning through personalization, interaction, feedback, and increased learner engagement. However, their primary emphasis has generally been on instructional applications or learning outcomes, with emotional variables receiving comparatively less systematic attention. Even reviews that consider affective dimensions have tended to concentrate on selected constructs, particularly foreign language enjoyment and anxiety, rather than examining the broader range of emotional and psychological experiences emerging in AI-assisted ESL/EFL learning.

Several gaps therefore remain in the existing evidence base. First, research on learner emotions is dispersed across different AI technologies, language skills, educational settings, and methodological designs, making it difficult to determine broader patterns across the field. Second, the emotional literature extends beyond enjoyment and anxiety to include constructs such as emotion regulation, resilience, well-being, engagement, learner confidence, and AI-related anxiety, but these dimensions have not yet been synthesized comprehensively. Third, the existing evidence does not consistently point in a single direction. Although many studies report reduced anxiety and enhanced positive emotional experiences, other findings raise concerns about AI-related anxiety, excessive dependence, reliability, and possible negative consequences of particular forms of AI use. This variation indicates that the relationship between AI-assisted learning and learner emotions should not be characterized simply as uniformly beneficial.

A further issue concerns the methodological development of this emerging research area. The available studies vary considerably in research design, educational context, participant characteristics, language skills, AI applications, and emotional measures. Such heterogeneity makes it difficult to compare findings and identify which emotional outcomes are most consistently associated with AI-assisted ESL/EFL learning. A systematic synthesis is therefore needed not only to determine what emotional constructs have been investigated, but also to examine how the existing evidence has been generated and where important methodological and contextual gaps remain.

The present systematic review addresses these gaps by synthesizing empirical research specifically concerned with learner emotions in AI-assisted ESL/EFL learning. Unlike reviews organized primarily around a particular AI application, language skill, or instructional outcome, this review brings together evidence across AI applications, educational settings, language-learning domains, emotional constructs, and research methodologies. The review includes 39 empirical studies and examines their methodological and contextual characteristics, the emotional and affective constructs investigated, and the empirical evidence concerning learners' emotional experiences. This broader scope enables the review to move beyond the question of whether AI is educationally effective and instead examine how learners emotionally experience AI-assisted language learning and what patterns can be identified across the emerging evidence.

Accordingly, the study has four related contributions. First, it provides an updated synthesis of the emotional dimensions of AI-assisted ESL/EFL learning. Second, it identifies methodological, contextual, and educational trends characterizing the existing empirical literature. Third, it synthesizes both positive and negative emotional outcomes, thereby avoiding an exclusively benefit-oriented interpretation of AI-assisted learning. Finally, it identifies unresolved issues and research priorities that can inform future empirical work and support educators, curriculum developers, researchers, and policymakers in designing AI-assisted learning environments that attend to both language development and learner well-being.

Based on these aims, the review addresses the following research questions:

RQ1. What methodological, contextual, and educational characteristics define the existing empirical literature on learner emotions in AI-assisted ESL/EFL learning?

RQ2. Which emotional and affective constructs have been investigated within AI-assisted ESL/EFL learning environments?

RQ3. What empirical evidence exists regarding the influence of AI-assisted ESL/EFL learning on learners' emotional experiences?

2. MATERIAL AND METHOD

2.1 Research Design

The present study adopted a systematic review approach to comprehensively synthesize empirical

evidence concerning learner emotions in AI-assisted ESL and EFL learning. A systematic review is recognized as a rigorous and transparent research method that identifies, evaluates, synthesizes, and critically appraises all available evidence relevant to clearly defined research questions. Unlike narrative reviews, systematic reviews primarily emphasize empirical investigations that provide research-based evidence rather than theoretical discussions or conceptual analyses.

For the purposes of this review, *AI-assisted language learning (AIALL)* refers to the use of AI technologies as instructional, interactive, adaptive, or learning-support tools within ESL and EFL learning environments. The term encompasses AI applications that provide functions such as personalized learning, conversational interaction, automated feedback, language assessment, speaking and writing practice, content generation, adaptive instruction, and support for learners' cognitive and affective processes. Accordingly, the present review includes a broad range of AI technologies represented in the empirical literature, including generative artificial intelligence (GenAI) systems, conversational chatbots, intelligent tutoring systems, automated writing-feedback tools, AI-assisted assessment systems, AI speaking assistants, and adaptive learning environments. This operational definition is used as the overarching terminology throughout the review because the included studies employ different labels for technologically mediated learning environments. Terms such as *AI-supported learning* and *AI-enhanced learning* are therefore treated as related descriptors rather than interchangeable constructs. Similarly, *generative AI* refers to a specific category of AI technology capable of generating content or responses and is considered a component of the broader AI-assisted learning landscape rather than a synonym for AI-assisted language learning.

Because the empirical studies included in this review employ diverse labels for AI-mediated learning environments, the review adopts the following terminology policy to distinguish the overarching construct from specific technological categories and study-specific descriptors. To ensure terminological consistency and conceptual clarity, the key terms used throughout the review are distinguished according to their specific functions and meanings, as presented in Table 1.

Table 1. Terminological distinctions used in the review

Term	Terminological function in this review
AI-assisted language learning (AIALL)	Primary umbrella term used throughout the review. It refers to the use of artificial-intelligence technologies as instructional, interactive, adaptive, or learning-support tools in ESL/EFL learning environments.
AI-assisted learning	Shortened form of *AI-assisted language learning*, used when the English-language learning context is already established.
AI-supported learning	Used primarily when describing terminology adopted by a particular study or source, or when the emphasis is specifically on AI as a support mechanism. It is not treated as interchangeable with the review's umbrella term.
AI-enhanced learning	Used primarily when referring to terminology adopted by a particular study or source that conceptualizes AI as enhancing an existing learning environment. It is not used as a synonym for AI-assisted language learning.
Generative AI (GenAI)	A specific category of artificial intelligence capable of generating content or responses, including text, dialogue, feedback, or other learning materials. It represents one technological form within the broader AI-assisted language-learning landscape.
ChatGPT	A specific generative-AI application. The term is used only when referring specifically to the ChatGPT system and is not treated as synonymous with AI or generative AI.
AI tools/applications/systems	General terms used when referring to specific technological components or applications employed in AI-assisted language learning.
AI-assisted assessment/writing/speaking	Domain-specific expressions used to describe particular applications of AI within assessment, writing instruction, speaking practice, or related language-learning activities.

This terminology policy is applied consistently in the synthesis and discussion, while study-specific terminology is retained when necessary to accurately represent the conceptualization or intervention reported in the original research. Following this methodological framework, the present review systematically examined empirical journal publications addressing learner emotions within AI-assisted ESL/EFL learning environments. The selected studies were analyzed based on the three research questions formulated for this review. To ensure methodological rigor, transparency, and reproducibility, the review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. In addition to the PRISMA screening procedure, the methodological quality of eligible studies was assessed before data extraction, and a structured coding protocol was applied throughout the analysis to enhance consistency and reliability. The PRISMA framework provides evidence-based standards for conducting and reporting systematic reviews and meta-analyses, thereby improving the transparency, completeness, and

credibility of the review process. The overall screening and selection procedure adopted in this study is illustrated in Figure 1.

2.1.1 Study Screening and Quality Assessment

Following the initial database search and duplicate removal, the retrieved records were independently screened by two reviewers in accordance with the PRISMA framework. The screening process was conducted in successive stages. First, the two reviewers independently examined the titles, abstracts, and author-supplied keywords of the retrieved records to identify studies that were clearly outside the scope of the review. Second, the full texts of potentially eligible studies were independently assessed against the predefined inclusion and exclusion criteria. Disagreements between the reviewers at either stage were discussed and resolved through consensus. Where necessary, the reviewers re-examined the relevant publication and the eligibility criteria before reaching a final decision.

Inter-rater agreement was assessed to provide an objective estimate of consistency between the two reviewers. Because the screening and quality-assessment decisions involved categorical judgments made independently by two reviewers, Cohen's kappa (κ) was used to quantify inter-rater agreement while accounting for agreement expected by chance. The coefficient was calculated based on the reviewers' independent screening judgments. The resulting inter-rater agreement was $\kappa = 0.81$**,** indicating almost perfect agreement between the two reviewers. Any disagreements that remained after the independent assessment were resolved through discussion and consensus.

Following eligibility screening, the included studies underwent a structured methodological quality appraisal designed to assess the methodological robustness and potential sources of bias relevant to the qualitative synthesis. The appraisal focused on four predefined criteria:

a) Clarity of the research objectives,

b) Appropriateness of the research design for the stated objectives,

c) Transparency of data collection and analysis procedures, and

d) Direct relevance of the study to learner emotions in AI-assisted ESL/EFL learning.

These criteria were selected to evaluate whether the included studies provided sufficiently clear, appropriate, and transparent methodological evidence to support interpretation of their findings. Each criterion was assessed independently by the two reviewers. The appraisal was conducted before data extraction and synthesis so that methodological limitations could be considered when interpreting the evidence.

Rather than assigning a single numerical quality score that could obscure differences among methodological dimensions, the reviewers considered each criterion separately and recorded the resulting judgments in the study-level coding file. Studies were retained when they met the predefined minimum methodological and relevance requirements. Reviewers resolved disagreements in quality judgments through discussion and consensus. This criterion-based approach enabled methodological weaknesses and potential sources of bias to be identified without reducing the overall methodological profile of each study to a single numerical value. The procedure was intended to enhance the transparency, consistency, and credibility of the evidence included in the review.

The quality-assessment criteria are presented in Table 2. Following the screening and quality-appraisal procedures, a total of 39 empirical studies (comprising 35 peer-reviewed publications and four grey-literature sources) were retained for qualitative synthesis.

Table 2. Quality Assessment Criteria

Criterion	Assessment focus
Clarity of research objectives	Whether the study clearly states its research objectives or questions.
Appropriateness of research design	Whether the selected research design is appropriate for addressing the stated objectives.
Transparency of data collection and analysis	Whether data collection procedures and analytical methods are sufficiently described and transparent.
Relevance to learner emotions in AI-assisted ESL/EFL learning	Whether the study directly addresses emotional or affective dimensions of AI-assisted ESL/EFL learning.

All 39 included studies met these quality criteria and were therefore retained for the final qualitative synthesis. The quality assessment was intended to ensure the credibility, transparency, and relevance of the evidence rather than to rank studies according to methodological quality.

2.2 Data Collection

Relevant studies were identified through systematic searches of four sources: Scopus, Web of Science, OpenGrey, and Google Scholar. These sources were selected to provide broad coverage of peer-reviewed scholarly publications as well as relevant gray literature

concerning learner emotions in AI-assisted English language learning. The searches were conducted between January 1, 2026, and January 31, 2026. No publication-date restriction was initially imposed, allowing both earlier and recently published empirical studies to be considered.

The search strategy was developed around three complementary conceptual domains: artificial intelligence technologies, English language learning, and learner emotions. Within each domain, related keywords and synonyms were combined using the Boolean operator OR, while the three conceptual domains were connected using AND. The generic search strategy was as follows:

("artificial intelligence" OR AI OR "generative AI" OR GenAI OR ChatGPT OR "large language model" OR chatbot OR "AI-assisted" OR "AI-supported" OR "AI-enhanced") AND (ESL OR EFL OR English OR "second language" OR "foreign language" OR "language learning" OR "L2 learning") AND (emotion OR affect OR anxiety OR enjoyment OR engagement OR motivation OR well-being OR "well-being" OR resilience OR "positive psychology").

Because Scopus, Web of Science, OpenGrey, and Google Scholar differ in their indexing systems, search interfaces, and search functionalities, the generic search strategy was adapted to the technical requirements of each source while maintaining the same three conceptual domains and substantive search terms. In Scopus, the search was conducted using the database's advanced search functionality to identify records containing terms related to artificial intelligence, English language learning, and learner emotions. In Web of Science, the equivalent conceptual groups were searched using the database's advanced search interface and relevant topic fields. OpenGrey was searched using combinations of the principal concepts and keywords to identify potentially relevant gray literature. Google Scholar was searched using combinations of the same core concepts and keywords, with particular attention to empirical studies addressing learner emotions in AI-assisted ESL/EFL learning. The searches were conducted on the following dates: Scopus— January 15, 2026; Web of Science—January 16, 2026; OpenGrey—January 17, 2026; Google Scholar—January 18, 2026.

The database searches produced 624 records from Web of Science, 782 from Scopus, and 56 from OpenGrey. Records identified through Google Scholar were incorporated into the overall identification process. All retrieved records were consolidated in a reference-management system, and duplicate records were removed before screening. The numbers of records identified, duplicates removed, records screened, full texts assessed, and studies ultimately included are presented in the PRISMA flow diagram (Figure 1).

Following duplicate removal, the remaining records were independently screened by two reviewers in successive stages consistent with the PRISMA framework. First, titles, abstracts, and author-supplied keywords were examined to identify studies that were clearly outside the scope of the review. Second, the full texts of potentially eligible publications were assessed against the predefined inclusion and exclusion criteria. Disagreements between the two reviewers were discussed and resolved through consensus. Inter-rater agreement for the screening process was assessed using Cohen's kappa (κ), with the resulting coefficient reported in Section 2.1.1.

To broaden the evidence base and help mitigate potential publication bias, both peer-reviewed publications and eligible gray literature were considered. Gray literature was primarily identified through OpenGrey and Google Scholar. Studies were eligible when they reported original empirical findings, focused on ESL or EFL learning, were published in English, and examined learner emotions or affective variables within an AI-assisted language-learning environment. Preference was given to peer-reviewed journal articles; however, eligible grey-literature publications, including conference proceedings, unpublished theses, book chapters, preprints, and secondary data analyses, were also considered when they met the predefined eligibility requirements.

Application of these criteria resulted in the inclusion of 35 peer-reviewed journal articles and four grey-literature publications, yielding a final corpus of 39 empirical studies for qualitative synthesis.

2.3 Data Analysis

Following the study selection process, the included publications were examined using the Technology-Based Learning Review (TLR) framework developed by Hsu et al. (2012). The TLR framework provides a comprehensive approach for synthesizing technology-enhanced learning research by considering multiple analytical perspectives, including research purposes, instructional applications, participant characteristics, and methodological features. It also emphasizes the relationships among learning environments, technological interventions, research topics, and research designs, thereby offering an appropriate structure for organizing evidence from AI-assisted language learning studies.

To increase the robustness of the analytical procedure, the present review further integrated coding principles adapted from the systematic review frameworks proposed by Chang and Hwang (2019). Combining these complementary frameworks allowed the analysis to capture both the educational and methodological characteristics of the selected studies while ensuring consistency throughout the coding process.

For analytical purposes, data extracted from each eligible publication were organized into four interrelated dimensions. The publication profile included information on the authors, publication source, and geographical location of the research. The educational context comprised the educational level, English language skill or learning content, and the AI technology or application employed. The

methodological profile documented the research methodology, study design (experimental or non-experimental), and data collection procedures. Finally, the research outcomes summarized the emotional constructs investigated together with the principal findings and their educational implications. To improve coding consistency, a structured coding protocol was developed before data extraction. The coding categories were derived from the review objectives and the TLR framework. During the coding process, previously coded studies were repeatedly revisited to ensure that similar evidence was categorized consistently across all publications. Any uncertainties regarding study classification were resolved through repeated examination of the original articles and comparison with the predefined coding framework. This iterative validation process enhanced the reliability and consistency of the synthesized findings.

Organizing the evidence within these four dimensions facilitated a systematic comparison across studies and provided a coherent basis for synthesizing the literature. Moreover, this analytical structure ensured that the extracted data directly addressed the objectives and research questions of the present systematic review (Figure 1).

Beyond descriptive classification, the synthesis involved a comparative and interpretive examination of patterns across the included studies. The reviewers compared findings across AI application types, educational contexts, language-learning domains, methodological designs, and emotional constructs to identify areas of convergence and divergence. Particular attention was given to whether similar emotional outcomes were reported across different technological and instructional conditions and whether contrasting findings could be associated with differences in study design, learner population, AI application, or learning context. Methodological characteristics were considered when interpreting the strength and consistency of reported emotional effects, especially where findings were based predominantly on cross-sectional, short-term, or self-reported data. The synthesis also examined relationships among positive emotions, negative emotions, and broader psychological constructs to determine whether the evidence supported a multidimensional rather than a single-directional account of learner affect. Finally, recurring limitations, underrepresented populations, insufficiently studied emotional constructs, and unresolved relationships between emotional and language-learning outcomes were identified as research gaps. This analytical procedure enabled the review to move beyond a descriptive summary of individual studies and to develop an integrated interpretation of consistencies, inconsistencies, methodological limitations, and unresolved questions within the evidence base.

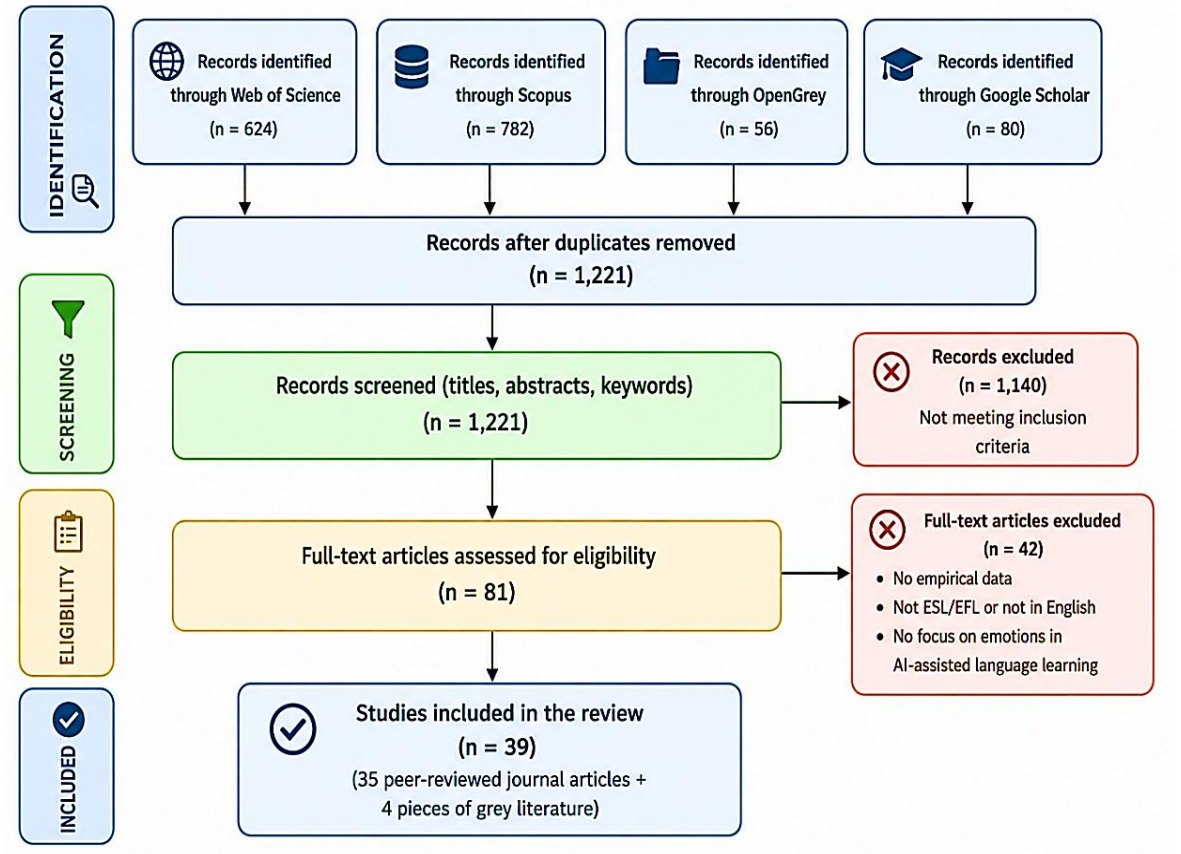


Figure 1. PRISMA flow diagram illustrating identification, screening, eligibility assessment, and final selection of studies

Figure 1 illustrates the systematic study selection process adopted in this review in accordance with the PRISMA guidelines. The systematic search of four sources—Web of Science, Scopus, OpenGrey, and Google Scholar—identified a total of 1,542 records. Following the removal of duplicate records, the remaining studies underwent title, abstract, and author-supplied keyword screening based on the predefined eligibility criteria. Potentially relevant records were subsequently assessed through full-text screening. Ultimately, 39 empirical studies met all eligibility requirements and were included in the systematic review, comprising 35 peer-reviewed journal articles and four grey-literature sources.

The systematic screening and selection procedures enhanced the transparency and reproducibility of the evidence-synthesis process, while methodological quality was assessed separately using the predefined quality-assessment criteria described in Section 2.2.1.

Following the study selection process, the characteristics of the included empirical studies were systematically coded and synthesized. Table 3 presents a comprehensive overview of the 39 studies included in this review, summarizing their principal methodological and contextual characteristics. Specifically, the table reports information on the authors and publication sources, AI-based applications employed, educational settings, research methodologies, data-collection techniques, experimental designs, emotional variables investigated, key findings, language-learning content, and research locations. This synthesis provides a holistic overview of the current empirical research landscape on learner emotions in AI-assisted ESL/EFL learning and establishes the empirical foundation for the subsequent analysis.

Table 3. Thematic characteristics of the included studies according to AI application

AI Application Category	Representative Studies	Educational Level	Research Design	Primary Emotional Variables	English Language Skill(s)	Principal Findings	Country/ Region
AI Speaking Assistants	Aldosari (2024); Deng et al., (2024); Hayashi & Sato, (2024); C. Zhang et al., (2024)	Mainly Higher Education	Quasi-experimental, Mixed-method, Quantitative	Foreign language anxiety, enjoyment, willingness to communicate, and interaction confidence	Speaking	AI speaking assistants consistently reduced speaking anxiety while enhancing willingness to communicate, interaction quality, and speaking confidence.	China, Japan, Saudi Arabia
AI Chatbots (ChatGPT, Doubao, Weixin Yiyuan, etc.)	Wang et al. (2025a); Wang et al. (2025b); Guo & Wang (2025); Liu et al. (2025); Rezai et al. (2024); Deng et al. (2024)	Higher Education	Quantitative, Mixed-method, Experimental	Engagement, enjoyment, emotional regulation, well-being, anxiety	Integrated language learning	AI chatbots promoted emotional engagement, improved emotional regulation, increased learner enjoyment, and reduced anxiety during language learning.	China, Iran
AI Writing Systems and Feedback Platforms	Shen & Tao (2025); Wang et al. (2024); Pawlak et al. (2025); Xu et al. (2024); Hao & Abu Bakar (2025)	Higher Education	Quantitative, Experimental	Writing anxiety, self-efficacy, enjoyment, boredom	Writing	AI-generated feedback improved writing quality, strengthened self-efficacy, reduced anxiety and boredom, and enhanced writing performance.	China, Malaysia, Iran

AI Application Category	Representative Studies	Educational Level	Research Design	Primary Emotional Variables	English Language Skill(s)	Principal Findings	Country/ Region
AI Assessment Systems	Abdellatif et al. (2024); Biju et al. (2024); Khan et al. (2024); Elov et al. (2025); Isaee & Barjesteh (2026a); Khasawneh et al. (2025); Elsayed et al. (2024)	Higher Education	Experimental, Mixed-method	Test anxiety, resilience, emotional regulation, motivation, attitudes, enjoyment	Listening, Speaking, Writing, Vocabulary	AI-supported assessment improved language achievement while reducing test anxiety and fostering resilience, motivation, and positive emotional experiences.	Saudi Arabia, Iran, Kazakhstan, Afghanistan, Uzbekistan, Ethiopia
AI Literacy and AI Learning Platforms	Chen et al. (2024); Fan & Zhang (2024); Zhang et al. (2025); Yu & Tao (2025); Zhang (2025)	Higher Education	Quantitative	AI anxiety, AI literacy, self-efficacy, emotion regulation, attitudes	General English	Greater AI literacy enhanced learners' confidence, reduced AI-related anxiety, improved emotion regulation, and encouraged sustained AI use.	China
Generative AI for General Language Learning	Derakhshan (2025); Du & Alm (2024); Ma (2024); Shi (2025); Isaee & Barjesteh (2026b); Xin & Derakhshan (2025); Yang et al. (2025); Zong & Yang (2025)	Higher Education	Qualitative, Mixed-method, Quantitative	Emotional engagement, well-being, motivation, identity, and emotional regulation	General ESL/EFL	Generative AI created emotionally supportive learning environments, enhanced engagement and well-being, while highlighting concerns regarding human interaction and cultural sensitivity.	Iran, United States, China, Malaysia
AI Vocabulary and Reading Systems	Khan et al. (2024); Chang & Hwang (2024); Lee et al. (2023)	Secondary & Higher Education	Experimental, Quantitative	Engagement, resilience, enjoyment, interest	Vocabulary, Reading	AI-assisted vocabulary and reading instruction improved engagement, vocabulary acquisition, and learner resilience.	Taiwan, Afghanistan, China

Note. *Studies are organized according to the dominant AI application rather than publication order to facilitate thematic comparison across research domains. Several studies addressed multiple AI technologies; therefore, they are classified according to their primary pedagogical application.*

While Table 3 provides a thematic synthesis of the included studies by categorizing them according to their primary AI applications, a more detailed examination of the individual studies is necessary to appreciate the methodological diversity and contextual characteristics of the existing evidence. Accordingly, Table 4 presents the detailed profile of each of the 39 empirical studies included in this review. To improve readability and facilitate comparison, the studies are reorganized according to their dominant AI application rather than their publication chronology. For each study, the table summarizes the AI technology employed, research design, participant characteristics, emotional variables examined, language-learning focus, and principal findings. This complementary presentation enables readers to identify methodological patterns across studies while preserving the unique contributions of each investigation.

Table 4. Detailed characteristics of the empirical studies included in the systematic review

No.	Study	AI Technology	Research Design	Participants	Emotional Variables	Language Skill	Major Outcome
1	Abdellatif et al. (2024)	AI listening assessment	Mixed-method	Higher education	Resilience, self-competence, mindset	Listening	Improved listening achievement and emotional resilience
2	Aldosari (2024)	AI chatbot	Quantitative	Higher education	WTC, enjoyment	Speaking	Enhanced willingness to communicate and enjoyment
3	Ali et al. (2025)	AI language testing	Quantitative	Higher education	Test anxiety	Assessment	Higher anxiety associated with greater AI tool use
4	Biju et al. (2024)	AI assessment	Experimental	Higher education	Anxiety, motivation, attitudes	Writing	Reduced anxiety and improved writing performance
5	D. Chen et al. (2024)	AI learning platform	Quantitative	Higher education	AI anxiety, self-efficacy	General English	AI anxiety negatively predicted technology use
6	Deng et al. (2024)	AI chatbot	Mixed-method	Higher education	WTC	Speaking	Improved willingness to communicate
7	Derakhshan (2025)	Generative AI	Quantitative	Higher education	Emotional engagement	General English	Improved emotional engagement
8	Du & Alm (2024)	ChatGPT	Qualitative	Higher education	Learning experience	Academic English	Students valued AI but preferred teacher empathy
9	Elov et al. (2025)	AI language assessment	Quantitative	Higher education	Shyness, anxiety, autonomy, enjoyment	Speaking	Reduced anxiety and increased learner autonomy
10	Elsayed et al. (2024)	AI-supported assessment	Experimental	Higher education	Demotivation, anxiety	Assessment	Teacher-supported AI assessment improved emotional outcomes
11	Fan & Zhang (2024)	AI-assisted EFL	Quantitative	Higher education	Enjoyment, attitudes, AI literacy	General English	Enjoyment mediated continued AI use
12	Guo & Wang (2025)	ChatGPT	Mixed-method	Higher education	Academic engagement, emotions	General English	Improved emotional and cognitive engagement
13	Hao & Abu Bakar (2025)	Generative AI	Mixed-method	Higher education	Academic engagement	Writing	Improved writing engagement
14	Hayashi & Sato (2024)	ChatGPT	Mixed-method	Higher education	Interaction anxiety	Speaking	Reduced anxiety and improved interaction

No.	Study	AI Technology	Research Design	Participants	Emotional Variables	Language Skill	Major Outcome
15	Isaee & Barjesteh (2026a)	AI-assisted learning	Mixed-method	Higher education	Enjoyment, attitudes, AI literacy, self-transcendence	General English	Positive relationship between AI use and emotional regulation
16	Isaee & Barjesteh (2026b)	AI-assisted learning	Mixed-method	Higher education	Positive and negative emotions	General English	Lower anxiety and higher achievement
17	Khan et al. (2024)	AI assessment	Experimental	Higher education	Resilience	Vocabulary	Enhanced resilience and vocabulary knowledge
18	Khasawneh et al. (2024)	AI portfolio assessment	Quasi-experimental	Higher education	Emotion regulation	Portfolio assessment	Improved mindfulness and emotion regulation
19	Lee et al. (2023)	AI learning activities	Quantitative	Secondary school	Enjoyment, interest	Reading	Improved reading enjoyment
20	Liu et al. (2025)	ChatGPT	Mixed-method	Higher education	Enjoyment, ideal L2 self	Informal learning	Strengthened ideal L2 self
21	Luo & Zou (2024)	ChatGPT	Quantitative	Higher education	Enjoyment	General English	Enjoyment supported psychological needs
22	Ma & Chen (2024)	AI applications	Experimental	Higher education	Emotion regulation	General English	Improved engagement and reduced procrastination
23	Ma (2024)	Generative AI	Qualitative	Higher education	Identity, anxiety	General English	Reduced language anxiety
24	Pawlak et al. (2025)	AI writing platform	Quantitative	Higher education	Enjoyment, boredom, anxiety	Writing	Greater enjoyment and lower anxiety
25	Rezai et al. (2024)	ChatGPT	Quantitative	Higher education	Emotion regulation	General English	Positive relationship between ChatGPT use and emotional regulation
26	Shen & Tao (2025)	AI writing assistant	Quantitative	Higher education	Writing anxiety	Writing	Self-efficacy mediated anxiety reduction
27	Shi (2025)	AI learning environment	Mixed-method	Higher education	Engagement	General English	Improved emotional engagement
28	D. Wang (2024)	AI writing	Quantitative	Higher education	Writing anxiety	Writing	Reduced writing anxiety
29	C. Wang, Li, et al. (2025)	AI feedback	Experimental	Higher education	Writing anxiety	Writing	Lower anxiety and higher achievement
30	C. Wang, Wang, et al. (2025)	ChatGPT	Quantitative	Higher education	Engagement, WTC	Speaking	Improved engagement and communication
31	C. Wang, Li, et al. (2025)	ChatGPT	Quantitative	Higher education	Emotion regulation	Writing	Enhanced emotional regulation

No.	Study	AI Technology	Research Design	Participants	Emotional Variables	Language Skill	Major Outcome
32	Xin & Derakhshan (2025)	Generative AI	Qualitative	Higher education	Positive and negative emotions	General English	Complex emotional experiences identified
33	X. Xu & Thien (2025)	AI writing	Quantitative	Higher education	Enjoyment, self-efficacy	Writing	Improved enjoyment and self-efficacy
34	Yang et al. (2025)	AI-supported learning	Mixed-method	Higher education	Positive emotions	General English	Improved emotional well-being
35	Yu & Tao (2025)	AI learning tools	Quantitative	Higher education	Emotion regulation	General English	Higher academic emotion regulation
36	S. Zhang & Liu (2025)	AI-assisted learning	Quantitative	Higher education	Emotion regulation	General English	Improved holistic learner development
37	Z. Zhang (2025)	Lora AI speaking assistant	Quasi-experimental	Higher education	FLA, FLE, WTC	Speaking	Reduced FLA; increased FLE and WTC
38	C. Zhang et al. (2024)	AI literacy	Quantitative	Higher education	AI literacy, anxiety, and self-efficacy	Speaking	AI literacy enhanced self-efficacy and reduced anxiety
39	Zong & Yang (2025)	AI-supported SEL	Quantitative	Higher education	Engagement, emotional well-being	General English	Improved emotional well-being and engagement

As illustrated in Table 4, the empirical literature on learner emotions in AI-assisted ESL/EFL learning is characterized by considerable methodological and contextual diversity. The reviewed studies employed a wide range of AI technologies, including intelligent tutoring systems, conversational chatbots, automated writing feedback platforms, AI-assisted assessment systems, speaking assistants, and generative AI applications. Although the majority of investigations were conducted in higher education settings using quantitative or quasi-experimental designs, several studies adopted mixed-method or qualitative approaches to obtain deeper insights into learners' emotional experiences. Across the reviewed literature, foreign language anxiety, foreign language enjoyment, willingness to communicate, emotional engagement, self-efficacy, resilience, emotion regulation, and learner well-being emerged as the most frequently examined affective variables. Overall, the evidence consistently suggests that AI-assisted language learning contributes positively to learners' emotional development while simultaneously supporting improvements in English language proficiency. The findings presented in Table 2 provide the empirical foundation for the thematic analyses discussed in the following Results section.

3. RESULTS AND DISCUSSION

3.1 Result

3.1.1 Characteristics of the Reviewed Studies

This section synthesizes the general characteristics of the 39 empirical studies included in the review. The analysis focuses on publication trends, AI applications, educational settings, methodological approaches, language-learning content, and geographical distribution. Together, these characteristics provide an overview of the current state of research on learner emotions in AI-assisted ESL/EFL learning and help contextualize the subsequent thematic findings.

3.1.1.1 Publication Trends and AI Applications

The reviewed studies were published between 2023 and 2026, indicating that research on learner emotions in AI-assisted ESL/EFL learning is a relatively recent area of inquiry. The emergence of this research trend corresponds closely with the widespread availability of generative AI technologies, particularly following the public release of ChatGPT in late 2022. As AI tools became increasingly accessible to educators and learners, researchers began to investigate not only their pedagogical effectiveness but also their influence on learners' emotional experiences and psychological well-being. The reviewed studies employed a wide range of AI-based technologies. These included generative AI systems such as ChatGPT, conversational chatbots, intelligent tutoring systems, AI-supported assessment platforms, automated writing feedback systems, AI-speaking assistants, and adaptive learning environments. Several studies also examined regionally developed AI applications, including *Weixin Yiyuan*, *Xunfei Xinghuo*, *Doubao*, *DeepSeek*,

Bodoudou, and EAP Talk. The diversity of AI tools represented in the literature demonstrates the expanding role of artificial intelligence in contemporary language education and highlights the growing integration of AI technologies into various aspects of ESL/EFL instruction.

The thematic synthesis presented in Table 1 further illustrates that AI applications have moved beyond simple content generation functions and now support a wide range of pedagogical activities. These activities include speaking practice, writing support, language assessment, vocabulary learning, emotional regulation, personalized feedback, learner engagement, and social-emotional learning. Consequently, AI-assisted language learning has evolved into a multifaceted educational ecosystem capable of supporting both cognitive and affective dimensions of language development.

3.1.1.2 Educational Contexts

Analysis of the reviewed studies reveals a strong concentration of research within higher education settings. Approximately 97% of the studies were conducted at the university level, whereas only a small proportion focused on secondary education. Notably, none of the reviewed studies investigated learner emotions in elementary school contexts. The predominance of higher education research may be explained by several factors. University students generally possess higher levels of linguistic proficiency, technological literacy, and academic autonomy, making them suitable participants for AI-assisted learning interventions. Furthermore, researchers often have easier access to university populations for data collection and experimental implementation. However, this imbalance limits current understanding of how AI-assisted language learning influences younger learners, whose emotional and cognitive characteristics may differ substantially from those of university students. Given the increasing adoption of educational technologies across all educational levels, the limited representation of primary and secondary school learners constitutes an important gap in the literature. Future research should therefore explore the emotional implications of AI-assisted language learning within K–12 contexts to establish a more comprehensive understanding of AI's impact across diverse educational environments.

3.1.1.3 Research Designs and Methodological Approaches

The reviewed studies employed a variety of methodological approaches, reflecting the multidimensional nature of learner emotions in AI-assisted language learning. Quantitative methods were the most frequently adopted approach, accounting for nearly half of the reviewed studies. These were followed by mixed-methods designs, quasi-experimental studies, and qualitative investigations. The dominance of quantitative research suggests that scholars have primarily focused on measuring emotional variables through standardized instruments, questionnaires, and statistical analyses. Such approaches have provided valuable evidence regarding the relationships between AI use and emotional outcomes such as anxiety, enjoyment, self-efficacy, and emotional engagement. At the same time, mixed-method and qualitative studies have offered deeper insights into learners' subjective experiences, perceptions, and emotional responses to AI-supported learning environments. Approximately half of the reviewed studies incorporated experimental or intervention-based designs. These investigations typically compared AI-assisted learning conditions with traditional instructional approaches and frequently employed pre- and post-tests to evaluate emotional and academic changes. The growing use of intervention studies indicates an increasing effort among researchers to establish causal relationships between AI-assisted learning experiences and learners' emotional outcomes.

A wide range of data collection techniques was observed across the reviewed studies. Common methods included questionnaires, surveys, interviews, focus groups, pre- and post-tests, intervention protocols, reflective narratives, open-ended responses, and classroom observations. The methodological diversity observed in the literature contributes to a richer understanding of learner emotions and provides multiple perspectives on the emotional consequences of AI-assisted language learning.

3.1.1.4 Language-Learning Content and Research Locations

The reviewed studies examined learner emotions across a broad range of English language-learning domains. While some investigations focused on general English learning experiences, others targeted specific language skills, including English for Academic Purposes (EAP), speaking, listening, writing, reading, vocabulary development, grammar instruction, literature studies, and language assessment. Speaking and writing emerged as particularly prominent areas of investigation, largely because AI technologies provide immediate feedback and interactive support in these domains.

The geographical dispersion of the studies demonstrates the global expansion of AI-assisted language learning research. Empirical investigations were conducted across numerous ESL and EFL contexts, including the United States, Saudi Arabia, Iran, Oman, China, Afghanistan, Iraq, Bangladesh, Ethiopia, Indonesia, Malaysia, Uzbekistan, Spain, and Japan. Among these countries, China accounted for the largest proportion of studies, reflecting both the rapid adoption of AI technologies in Chinese education and the growing academic interest in AI-assisted language

learning within the region. The international distribution of the reviewed studies suggests that learner emotions in AI-assisted language learning constitute a globally relevant research topic. At the same time, the concentration of studies within a limited number of countries indicates the need for broader geographical representation to ensure a more comprehensive understanding of cultural and contextual influences on learners' emotional experiences.

Overall, the reviewed literature reveals that research on the emotions of learners in AI-assisted ESL/EFL learning is an emerging and rapidly expanding field. The studies demonstrate substantial diversity in AI technologies, research designs, language-learning domains, and geographical contexts. Nevertheless, several patterns are evident, including the predominance of higher education settings, the widespread use of quantitative methodologies, and the growing emphasis on generative AI applications. These characteristics provide the contextual foundation for understanding the emotional variables investigated in the literature, which are examined in the next section.

3.1.2 Emotional Variables Investigated in AI-Assisted EFL/ ESL Learning

To address the second research question, the reviewed studies were examined to identify the emotional variables investigated in AI-assisted ESL/EFL learning. The analysis demonstrates that researchers have explored a diverse range of affective constructs encompassing both positive and negative emotions, as well as broader psychological characteristics that influence language learning. Although foreign language anxiety and foreign language enjoyment emerged as the most frequently examined variables, recent studies have increasingly investigated emotional engagement, willingness to communicate, resilience, self-efficacy, emotion regulation, learner well-being, motivation, and AI-related anxiety. This diversity reflects the growing recognition that emotions constitute a multidimensional component of language learning rather than isolated psychological states. For analytical clarity, the identified emotional variables were classified into three overarching categories: positive emotions, negative emotions, and self-regulatory and motivational constructs. This classification highlights the expanding scope of affective research in AI-assisted language learning while facilitating comparisons across the reviewed studies.

3.1.2.1 Positive Emotional Variables

Positive emotions represented the most extensively investigated category within the reviewed literature. Among these, FLE was the dominant construct, appearing across numerous studies involving AI chatbots, intelligent tutoring systems, automated writing platforms, and AI-assisted speaking applications. The findings consistently demonstrated that AI-supported learning environments enhanced learners' enjoyment by creating interactive, personalized, and low-pressure opportunities for language practice (Chang & Hwang, 2019; Q. Zhang et al., 2025; S. Zhang, 2025). Beyond enjoyment, several studies examined willingness to communicate (WTC), particularly in AI-supported speaking environments. Conversational AI systems enabled learners to practice English without fear of negative evaluation, thereby increasing their confidence and readiness to engage in spoken communication (Aldosari, 2024; Alhusaiyan, 2025). Similarly, emotional engagement emerged as another frequently reported outcome, with learners describing AI-assisted activities as motivating, interactive, and intellectually stimulating (Guo & Wang, 2025). Other positive emotional variables included interest, academic engagement, psychological well-being, learning satisfaction, and positive attitudes toward AI-assisted learning. Collectively, these findings suggest that AI technologies can foster supportive learning environments that encourage active participation, promoting learners' confidence and emotional well-being during language learning activities.

3.1.2.2 Negative Emotional Variables

Among negative emotions, FLA was by far the most extensively investigated construct. Consistent with broader research in second language acquisition, the reviewed studies regarded anxiety as one of the principal emotional barriers to effective language learning. Across different AI applications, researchers generally reported significant reductions in learners' anxiety following AI-assisted instruction (Biju et al., 2024; T. Zhang & Liu, 2025). Several factors contributed to this reduction. AI systems provided immediate yet non-judgmental feedback, allowed repeated practice without embarrassment, and eliminated many of the social pressures commonly associated with teacher- or peer-centered classroom interaction. These characteristics enabled learners to experiment with language more confidently while reducing fear of making mistakes. In addition to foreign language anxiety, several studies investigated writing anxiety, speaking anxiety, AI anxiety, shyness, boredom, and demotivation. Although these variables appeared less frequently than FLA, the findings similarly suggested that appropriately designed AI learning environments can alleviate many negative emotional experiences associated with second language learning. Nevertheless, a small number of studies cautioned that excessive dependence on AI technologies or uncertainty regarding AI-generated feedback may create new forms of technology-related anxiety, emphasizing the importance of balanced instructional implementation (X. Chen et al., 2022).

3.1.2.3 Self-Regulatory and Motivational Constructs

Beyond traditional positive and negative emotions, many studies examined broader psychological characteristics associated with learners' emotional development. Among these, *emotion regulation* emerged as one of the fastest-growing research topics. AI-supported learning environments appeared to help

learners monitor, manage, and regulate their emotional responses more effectively during challenging language-learning tasks (Rezai et al., 2024). Similarly, *self-efficacy* received considerable scholarly attention. Learners who perceived themselves as capable of successfully using AI technologies generally reported higher confidence, stronger academic engagement, and more positive emotional experiences (Rezai et al., 2024). Several studies further demonstrated that self-efficacy functioned as a mediating variable linking AI use to emotional and academic outcomes.

Additional constructs examined across the literature included resilience, growth mindset, learner autonomy, AI literacy, motivation, academic engagement, and psychological well-being. These variables indicate that researchers increasingly conceptualize learner emotions as components of broader self-regulatory systems rather than isolated affective responses. Consequently, AI-assisted language learning is being viewed not only as a technological innovation but also as a means of supporting learners' emotional resilience and long-term psychological development. The collective findings reveal that emotional research in AI-assisted ESL/EFL learning has evolved beyond the traditional emphasis on foreign language anxiety. Contemporary investigations increasingly adopt multidimensional perspectives that encompass positive emotions, negative emotions, motivational characteristics, and self-regulatory processes. Nevertheless, foreign language enjoyment and foreign language anxiety remain the two dominant emotional constructs investigated across the reviewed studies. Overall, the reviewed literature demonstrates that AI-assisted language learning is associated with improvements in multiple emotional dimensions. Most empirical evidence suggests that AI technologies simultaneously enhance positive emotional experiences like engagement, enjoyment, confidence, and willingness to communicate, while reducing negative emotions, including boredom, anxiety, and shyness. These findings provide important evidence that learner emotions constitute one of the principal mechanisms through which AI technologies contribute to successful language learning.

To provide a clearer conceptual understanding of the emotional dimensions examined in the reviewed studies, Figure 2 classifies the identified emotional variables into three overarching categories. This classification synthesizes the affective constructs reported across the empirical literature and illustrates the multidimensional nature of learner emotions in AI-assisted ESL/EFL learning. Rather than treating emotions as isolated psychological states, the figure demonstrates the interconnected roles of positive emotions, negative emotions, and self-regulatory or motivational constructs in shaping learners' experiences with artificial intelligence.

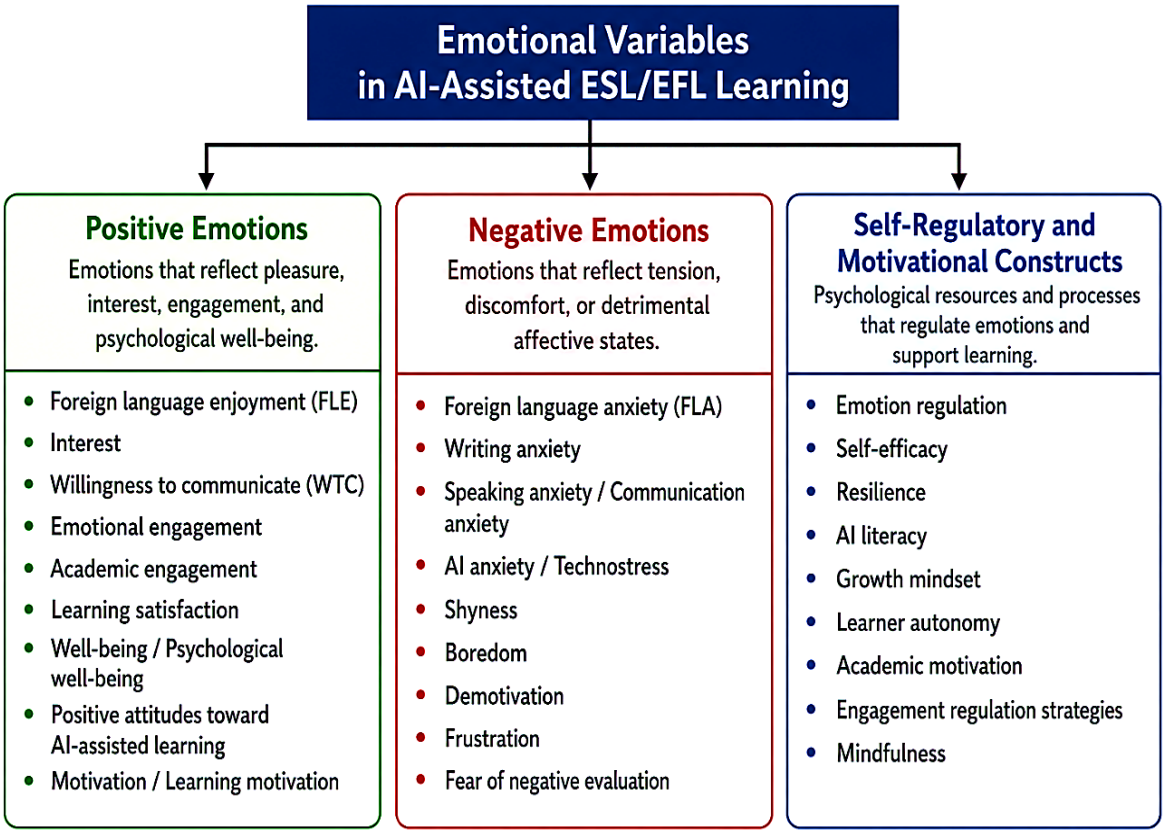


Figure 2. Classification of emotional variables investigated in AI-assisted ESL/EFL learning

As illustrated in Figure 2, the reviewed studies investigated a broad spectrum of emotional variables that can be organized into three major categories. The first category, positive emotions, encompasses constructs such as foreign language enjoyment, interest, willingness to communicate, emotional engagement, academic engagement, learning satisfaction, psychological well-being, positive attitudes toward AI-assisted learning, and learning motivation. These emotions generally promote active participation, confidence, and persistence during English language learning. The second category comprises negative emotions, including foreign language anxiety, writing anxiety, speaking anxiety, AI anxiety, shyness, boredom, demotivation, frustration, and fear of negative evaluation. These affective states are typically associated with communication apprehension, reduced learning confidence, and diminished classroom participation. However, the reviewed evidence consistently indicates that appropriately implemented AI technologies can alleviate many of these negative emotional experiences by providing supportive, personalized, and non-judgmental learning environments. The third category consists of self-regulatory and motivational constructs, such as emotion regulation, self-efficacy, resilience, AI literacy, growth mindset, learner autonomy, academic motivation, engagement regulation strategies, and mindfulness. Unlike traditional emotional variables, these constructs represent learners' psychological resources that enable them to manage emotions effectively, adapt to learning challenges, and sustain motivation throughout the language-learning process. Overall, Figure 2 demonstrates that contemporary research has moved beyond the traditional emphasis on foreign language anxiety and enjoyment toward a more comprehensive understanding of learners' emotional development. The findings indicate that AI-assisted language learning affects not only immediate emotional reactions but also broader psychological processes that contribute to long-term language learning success.

3.1.3 Effects of AI-Assisted ESL/EFL Learning on Learners' Emotional Variables

The third research question examined how AI-assisted ESL/EFL learning influences learners' emotional experiences. Overall, the findings indicate a generally favorable pattern across the 39 reviewed studies, with AI-assisted learning environments frequently associated with enhanced positive emotions, reduced negative emotional experiences, and strengthened psychological resources relevant to language learning. However, the direction and strength of these outcomes varied across AI applications, learning activities, emotional constructs, educational contexts, and methodological approaches. Although many studies reported positive emotional outcomes, a smaller number identified concerns related to technology dependence, AI-related anxiety, uncertainty about AI-generated information, and ethical issues. The evidence therefore does not support the assumption that AI-assisted language learning produces uniformly positive emotional outcomes. Instead, the findings suggest that the emotional effects of AI are context-dependent and may reflect the interaction between technological affordances, instructional conditions, and learners' individual experiences.

For analytical purposes, the synthesized findings are presented under three interrelated themes: 1) reduction of negative emotions, 2) enhancement of positive emotions, and 3) promotion of learners' emotional resilience and self-regulation. This organization enables comparison across the reviewed studies while also highlighting areas of convergence, variation, and emerging research gaps within the evidence base.

3.1.3.1 Enhancement of Positive Emotional Experiences

One of the most consistent findings across the reviewed research is that AI-assisted learning environments can enhance positive emotional experiences. Numerous investigations reported significant improvements in foreign language enjoyment, learner engagement, willingness to communicate, confidence, and academic satisfaction following AI-supported learning interventions (Pawlak et al., 2025). Several characteristics of AI technologies appear to explain these positive outcomes. First, conversational AI systems provide learners with immediate opportunities for authentic communication without the fear of social judgment commonly associated with classroom interaction. Because learners can practice repeatedly at their own pace, they become more willing to experiment with language and participate actively in communication tasks. Consequently, many learners reported greater enjoyment and increased confidence when interacting with AI-powered speaking assistants and conversational chatbots (Deng et al., 2024). Second, personalized feedback generated by AI systems contributes substantially to learners' emotional satisfaction. Unlike traditional feedback, which may be delayed or limited by instructional time, AI applications offer immediate responses that enable learners to identify mistakes, revise their performance, and monitor their progress continuously. This rapid feedback cycle reinforces learners' confidence while increasing motivation to continue learning (Shen & Tao, 2025). Furthermore, AI-assisted learning environments encourage greater learner autonomy by allowing students to determine their own learning pace, select learning resources, and practice independently. This increased sense of control over the learning process contributes positively to learners' emotional well-being, engagement, and academic motivation (Yang et al., 2025).

3.1.3.2 Reduction of Negative Emotional Experiences

Another prominent finding emerging from the reviewed literature concerns the reduction of negative emotional experiences. Foreign language anxiety consistently appeared as the emotional variable most positively influenced by AI-assisted learning. Across

speaking, writing, assessment, and general English learning contexts, AI technologies were found to alleviate communication anxiety, writing apprehension, and fear of negative evaluation (Biju et al., 2024). Several explanations account for this trend. AI systems create psychologically safe learning environments where learners can make mistakes without embarrassment or criticism from teachers and peers. Such environments reduce emotional pressure while encouraging repeated practice until learners achieve greater confidence and competence. Similarly, AI-supported writing assistants help learners overcome writing anxiety by providing detailed corrective feedback, grammar suggestions, vocabulary recommendations, and organizational guidance. Because revisions can be completed privately and repeatedly, learners become less apprehensive about producing written English (MacIntyre & Vincze, 2017). Although most studies emphasized positive emotional outcomes, several investigations also highlighted emerging challenges associated with AI-assisted learning. For example, excessive reliance on AI-generated responses may reduce learners' independent problem-solving and critical thinking abilities. In addition, concerns regarding inaccurate AI-generated information, privacy protection, ethical issues, and uncertainty surrounding AI feedback occasionally generated AI-related anxiety among learners (Du & Alm, 2024). Nevertheless, these concerns were reported far less frequently than the emotional benefits associated with AI-assisted instruction.

3.1.3.3 Promotion of Emotional Regulation and Psychological Growth

Beyond influencing immediate emotional reactions, AI-assisted language learning also contributes to broader psychological development. Numerous studies have demonstrated that AI technologies strengthen learners' capacity to regulate emotions, maintain motivation, and respond constructively to learning challenges (Dewaele et al., 2019).

Emotion regulation emerged as one of the most rapidly expanding research themes within the reviewed literature. AI-supported learning environments enable learners to monitor their own progress, receive continuous feedback, and adjust learning strategies in response to challenges. Consequently, learners become more capable of managing frustration, maintaining motivation, and sustaining engagement throughout extended learning activities. The reviewed evidence further indicates that AI-assisted learning promotes higher levels of self-efficacy and resilience. Learners who successfully interacted with AI systems generally developed stronger confidence in their language-learning abilities and greater willingness to undertake challenging tasks. Several studies additionally reported improvements in learner autonomy, growth mindset, and AI literacy, suggesting that AI technologies support not only language acquisition but also broader psychological competencies essential for lifelong learning.

Collectively, these findings indicate that AI functions not merely as an instructional technology but also as a psychological support mechanism that facilitates learners' emotional adaptation within increasingly technology-rich educational environments. The evidence synthesized across the reviewed studies demonstrates a consistent pattern of positive emotional outcomes associated with AI-assisted ESL/EFL learning. AI technologies enhance learners' enjoyment, engagement, willingness to communicate, confidence, emotional well-being, and learning satisfaction while simultaneously reducing anxiety, shyness, boredom, and other negative emotional experiences. In addition, AI-supported learning environments foster important self-regulatory capacities (including emotion regulation, resilience, self-efficacy, learner autonomy, and AI literacy) that contribute to sustained language learning success. Despite these encouraging findings, the review also highlights the importance of balanced AI integration. The reviewed studies consistently emphasize that AI should complement rather than replace teachers' pedagogical expertise. Human guidance remains essential for addressing learners' emotional needs, promoting critical thinking, ensuring ethical AI use, and providing the interpersonal support that current AI systems cannot fully replicate. To provide a holistic synthesis of the reviewed evidence, Figure 3 presents a conceptual framework illustrating the mechanisms through which AI-assisted learning influences learners' emotional experiences in ESL/EFL contexts. Rather than depicting isolated emotional outcomes, the framework integrates the principal findings of the reviewed studies by demonstrating how different AI technologies facilitate specific instructional mechanisms that subsequently shape learners' emotional responses and contribute to improved English language learning outcomes.

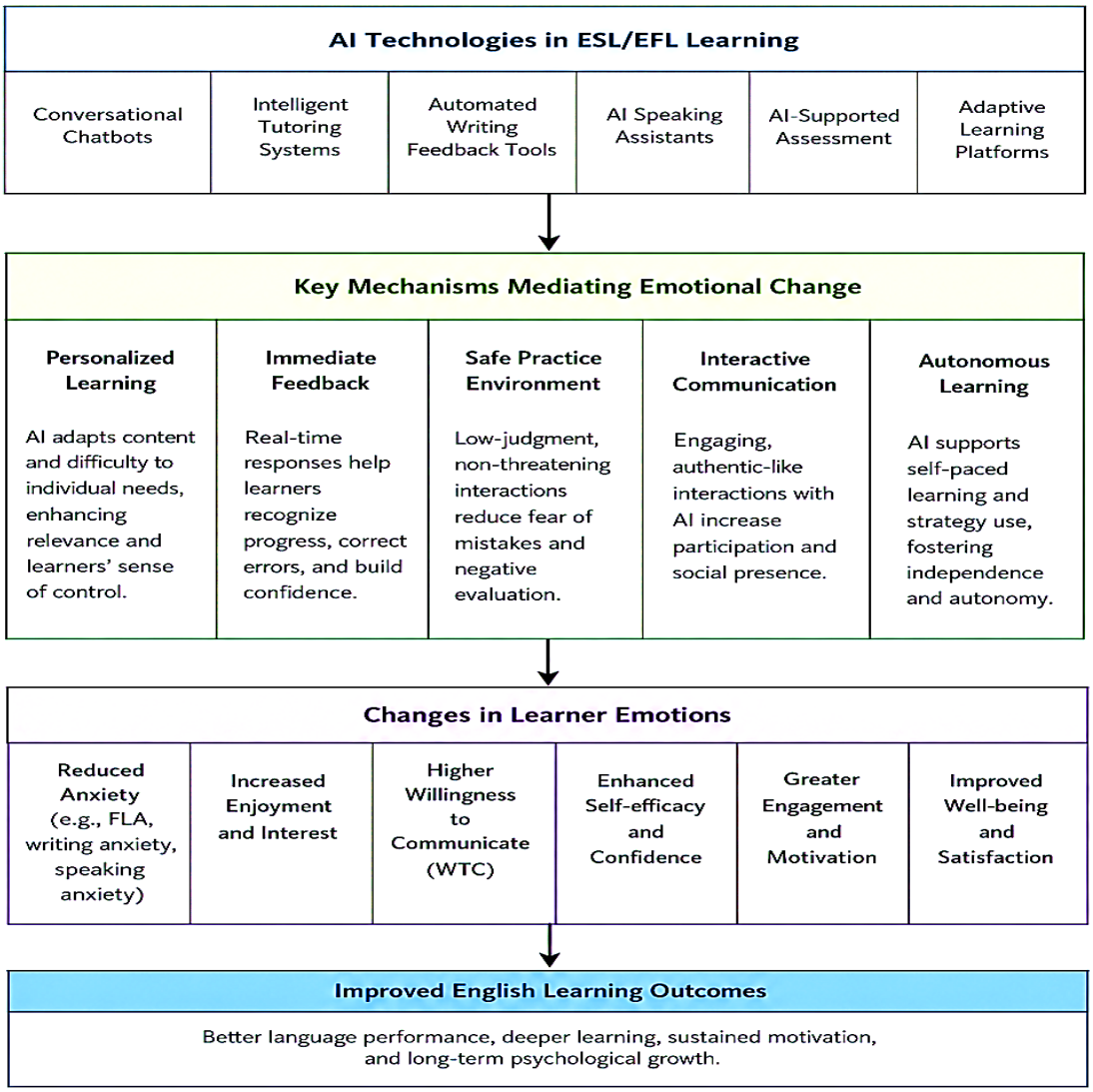


Figure 3. Mechanisms through which AI influences learner emotions in EFL/ ESL learning

As illustrated in Figure 3, the influence of artificial intelligence on learner emotions follows a progressive and interconnected process. At the first level, various AI technologies (including conversational chatbots, intelligent tutoring systems, automated writing feedback tools, AI speaking assistants, AI-supported assessment platforms, and adaptive learning systems) provide the technological foundation for AI-assisted English language instruction.

These technologies facilitate several pedagogical mechanisms that mediate learners' emotional experiences. Among the most influential mechanisms are personalized learning, immediate formative feedback, psychologically safe practice environments, interactive communication opportunities, and autonomous learning. Collectively, these instructional features create supportive learning conditions that encourage active participation while reducing the emotional pressures frequently associated with traditional language classrooms.

As learners interact with these AI-supported environments, positive emotional changes become increasingly evident. The reviewed studies consistently reported reductions in foreign language anxiety, writing anxiety, and speaking anxiety, alongside increases in willingness to communicate, foreign language enjoyment, self-efficacy, confidence, learner engagement, academic motivation, psychological well-being, and overall learning satisfaction. These emotional improvements enable learners to participate more confidently in English language learning activities while strengthening their persistence when encountering linguistic challenges.

Ultimately, the cumulative effect of these emotional changes contributes to improved outcomes in English language learning. Beyond enhancing language proficiency, AI-assisted learning promotes deeper learner engagement, sustained motivation, greater learner autonomy, and long-term psychological development. Nevertheless, as discussed throughout this review, these benefits are most likely to be achieved when AI technologies complement rather than replace teachers' pedagogical expertise and interpersonal support.

Overall, Figure 3 synthesizes the principal findings of this systematic review into a unified conceptual model, demonstrating that AI technologies influence learners' emotional experiences indirectly through multiple pedagogical mechanisms, which subsequently foster more positive emotional states and improved language learning outcomes.

Additionally, to provide a concise overview of the synthesized evidence, Table 4 summarizes the major findings of the reviewed studies. The table integrates the principal research trends, educational contexts, methodological characteristics, emotional outcomes, and remaining research gaps identified across the 39 empirical studies. This summary highlights the current state of knowledge regarding learner emotions in AI-assisted ESL/EFL learning and provides a foundation for the discussion of the study's implications and future research directions.

Table 4. Summary of Major Findings Across the Reviewed Studies

Theme	Main Findings	Overall Trend
AI applications	ChatGPT, chatbots, intelligent tutoring systems, AI writing assistants, automated feedback	Rapid diversification of AI tools
Educational contexts	Predominantly higher education	Limited K–12 research
Research designs	Mainly quantitative and quasi-experimental	Increasing use of mixed methods
Positive emotions	Enjoyment, engagement, confidence, willingness to communicate, well-being	Generally increased
Negative emotions	Foreign language anxiety, writing anxiety, boredom	Generally decreased
Self-regulatory outcomes	Self-efficacy, emotion regulation, resilience, autonomy	Mostly improved
Research gaps	Few longitudinal studies, limited to younger learners, and narrow emotional constructs	Future research needed

To complement the tabular summary, Figure 3 visually presents the overall findings of this systematic review. The figure illustrates the positive emotional outcomes, reductions in negative emotions, and major research gaps identified across the reviewed studies, providing an integrated understanding of learner emotions in AI-assisted ESL/EFL learning.

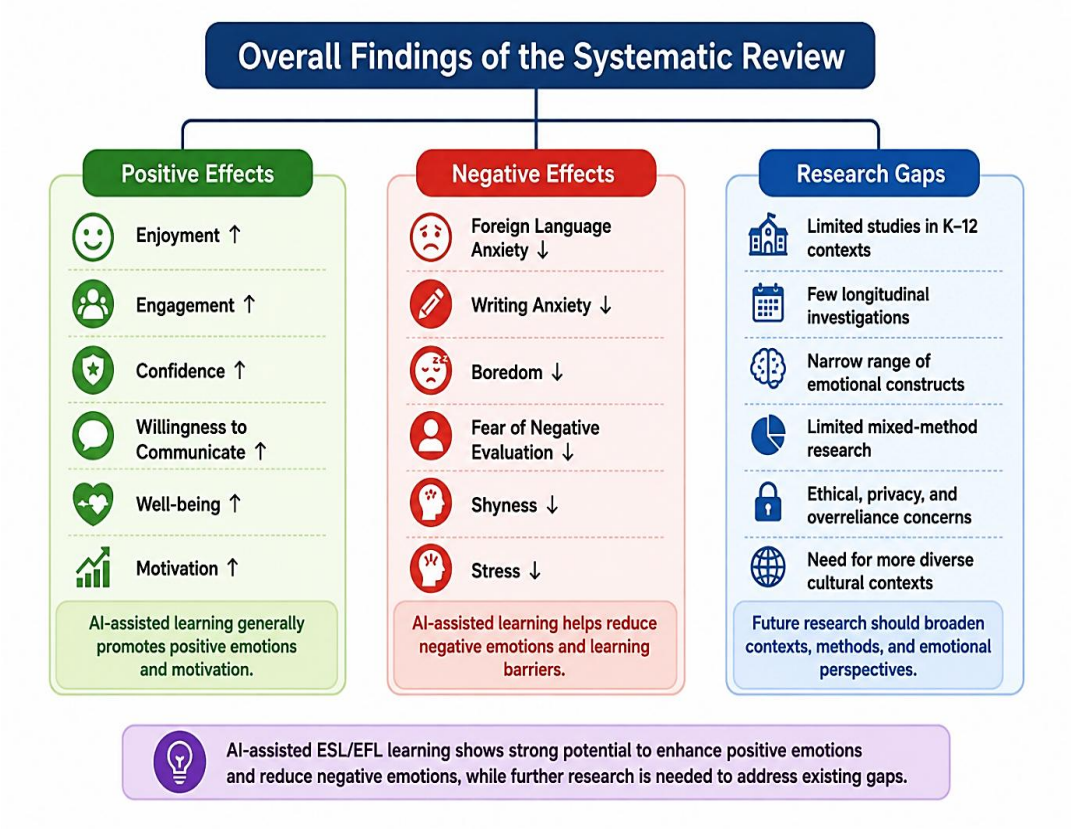


Figure 3. Overall Findings of the Systematic Review

3.2 Discussion

This systematic review synthesized empirical evidence from 39 studies examining learner emotions in AI-assisted ESL/EFL learning. Taken together, the findings indicate a generally favorable pattern across several positive emotional and psychological outcomes, including foreign language enjoyment, engagement, willingness to communicate, self-efficacy, confidence, resilience, and psychological well-being. These findings are broadly consistent with recent research emphasizing the affective dimensions of technology-mediated language learning (Dewaele & Li, 2020; Isaee et al., 2025, 2026; Isaee & Barjesteh, 2025, 2026b; Manoochehrzadeh et al., 2025; Risdianto et al., 2025; C. Wang, Li, et al., 2025; Z. Zhang, 2025).

At the same time, the evidence is neither uniformly positive nor sufficiently homogeneous to support the conclusion that AI-assisted learning produces consistently beneficial emotional outcomes across contexts. The reviewed studies reveal important differences according to the type of AI technology, learning activity, emotional construct, educational context, and degree of teacher involvement. Accordingly, the emotional consequences of AI-assisted language learning should be understood as context-dependent rather than as an inherent property of artificial intelligence itself.

One important pattern is the coexistence of positive and negative emotional experiences within the same broader AI-assisted learning environment. Many studies reported reduced foreign language, speaking, or writing anxiety and increased enjoyment, confidence, and engagement (Biju et al., 2024; Deng et al., 2024; Guo & Wang, 2025; Pawlak et al., 2025). However, other studies identified AI-related anxiety, uncertainty concerning the reliability of AI-generated information, concerns about privacy and ethical use, and excessive dependence on AI (Derakhshan, 2025; Du & Alm, 2024; X. Xu & Thien, 2025). This apparent inconsistency suggests that AI may reduce some forms of language-learning anxiety while simultaneously introducing new forms of technology-related uncertainty. The emotional value of AI therefore appears to depend partly on what learners are anxious about. When AI reduces fear of peer or teacher evaluation, it may create a psychologically safer environment for practice; when learners are uncertain about the accuracy, transparency, or appropriate use of AI, the same technology may become a source of anxiety. The evidence consequently challenges a simple distinction between AI as a solution to negative emotions and conventional instruction as their source.

A related issue concerns the considerable heterogeneity of the AI applications represented in the reviewed literature. The studies examined generative AI systems, conversational chatbots, intelligent tutoring systems, automated writing-feedback platforms, AI-assisted assessment, speaking assistants, and other adaptive or AI-supported environments. Recent reviews similarly indicate that AI applications in language education have expanded substantially beyond the early emphasis on automated writing and ChatGPT-based applications (Li et al., 2024; G. Xu et al., 2025; Yu & Tao, 2025). These technologies do not provide equivalent pedagogical experiences. A conversational chatbot used for repeated speaking practice, for example, creates a different interactional environment from an automated writing-feedback system or an AI-based assessment platform. Consequently, aggregating these technologies under the single category of AI-assisted learning is useful for identifying broad research trends but may conceal important differences in the mechanisms through which particular technologies shape learner emotions. Future research should therefore move beyond asking whether AI affects emotions and examine which technological affordances are associated with particular emotional outcomes and under which instructional conditions.

The reviewed evidence also suggests that pedagogical mediation may be more consequential than technological sophistication alone. Positive emotional outcomes were frequently associated with specific affordances such as personalized learning, immediate feedback, repeated practice, flexible pacing, and reduced social-evaluative pressure (Chang & Hwang, 2019; Deng et al., 2024; Shi, 2025; X. Xu & Thien, 2025; Zong & Yang, 2025). These findings support the broader argument that the educational value of AI depends substantially on how technologies are integrated into instructional practice rather than on technological sophistication alone. Conversely, studies reporting concerns about dependence, inaccurate feedback, or ethical uncertainty indicate that technological access does not automatically guarantee positive emotional experiences (Isaee, 2026; Isaee & Barjesteh, 2025, 2026a). The finding that learners may value AI while continuing to require teacher empathy and interpersonal support is particularly important because it challenges the assumption that increasingly sophisticated AI systems can independently satisfy all affective needs of language learners. AI may provide responsiveness, personalization, and low-pressure practice, but interpersonal support, pedagogical judgment, and emotional understanding remain important components of language education.

Methodological heterogeneity represents another major consideration when interpreting the overall pattern of findings. The reviewed literature was dominated by quantitative and quasi-experimental investigations, while relatively fewer studies employed longitudinal, qualitative, or mixed-method designs. This pattern is also reflected in the methodological characteristics summarized across the reviewed studies. Quantitative studies can provide useful evidence concerning relationships between AI use and emotional variables, but cross-sectional designs provide limited information about how emotions develop over time. Similarly, short-term intervention studies may capture initial enthusiasm or novelty effects without determining

whether emotional benefits remain stable after prolonged AI use. The predominance of short-duration studies therefore makes it difficult to distinguish sustained emotional development from temporary reactions to a new technology. This limitation is particularly important because emotions are dynamic and can change as learners become familiar with, adapt to, or become more dependent on technological systems (Dewaele & Li, 2020).

The measurement of emotional constructs also presents a challenge for cross-study synthesis. The reviewed studies examined a wide range of constructs, including foreign language enjoyment, foreign language anxiety, writing anxiety, speaking anxiety, emotional engagement, self-efficacy, resilience, emotion regulation, well-being, motivation, and AI-related anxiety. The increasing breadth of these constructs reflects a shift from a narrow focus on foreign language anxiety toward a more multidimensional conceptualization of learner affect (Dewaele et al., 2019). However, these constructs are conceptually related but are not interchangeable, and the studies did not necessarily operationalize them in identical ways. As a result, the apparent consistency of the overall findings should not be interpreted as evidence of a single unified emotional effect. Instead, the evidence points toward a multidimensional affective pattern in which different emotional and psychological resources may respond differently to particular AI-supported activities.

Another unresolved issue concerns the relationship between emotional outcomes and language-learning outcomes. Several reviewed studies reported emotional improvements alongside gains in writing, speaking, vocabulary, reading, or general English performance. However, the coexistence of these outcomes does not necessarily demonstrate that improved emotions caused improved language achievement, or that AI directly produced both outcomes. In some studies, emotional variables such as self-efficacy appeared to function as mediating factors linking AI use with academic and emotional outcomes (Harajpoor et al., 2026; Hayashi & Sato, 2024), whereas other investigations primarily documented learners' perceptions or changes in affective measures. The evidence therefore supports an important relationship between the affective and linguistic dimensions of AI-assisted learning, but it does not yet establish a uniform causal pathway linking AI use, emotional change, and language achievement. Future studies should explicitly test these pathways using longitudinal, experimental, and mediation or moderation designs where appropriate.

The contextual distribution of the evidence further limits the extent to which the findings can be generalized. Approximately 97% of the reviewed studies were conducted in higher education, with very limited representation of secondary education and no identified studies involving elementary-school learners. This concentration means that current knowledge largely reflects the experiences of university students, who may differ from younger learners in technological literacy, autonomy, language proficiency, and attitudes toward AI. The geographical concentration of research, particularly in China and other Asian contexts, raises a similar concern. Emotional experiences are shaped by cultural values, educational traditions, classroom interaction patterns, and beliefs about learning and technology. Consequently, findings obtained predominantly from particular educational and cultural settings should not automatically be generalized to ESL/EFL learners worldwide. Broader cross-cultural research is therefore needed to determine whether the emotional patterns identified in the present review remain consistent across different educational systems and sociocultural contexts.

The review also identifies an important conceptual gap in the existing literature. Although researchers increasingly examine multiple emotional and psychological constructs, many studies continue to investigate individual variables separately. This fragmented approach makes it difficult to understand how enjoyment, anxiety, self-efficacy, engagement, emotion regulation, autonomy, and well-being interact within AI-assisted learning environments. Recent developments in second-language emotion research have increasingly emphasized the interconnected and dynamic nature of positive and negative emotions rather than treating them as isolated states (Derakhshan, 2025; MacIntyre & Vincze, 2017; Shen & Tao, 2025). Learner emotions are dynamic and interconnected, and an intervention that reduces anxiety may simultaneously influence confidence, enjoyment, motivation, or willingness to communicate. Future research should therefore adopt theoretically informed models capable of examining relationships among multiple affective dimensions rather than treating individual emotions as isolated outcomes.

Overall, the evidence suggests that the emotional value of AI-assisted ESL/EFL learning depends less on the mere presence of AI than on the interaction among technological affordances, pedagogical design, learner characteristics, emotional needs, and human mediation. The reviewed literature provides encouraging evidence of positive emotional experiences, but it also reveals important uncertainties concerning long-term emotional development, technology-specific differences, measurement consistency, contextual variation, and the balance between technological support and human interaction (Derakhshan, 2025; Du & Alm, 2024; Fan & Zhang, 2024; T. Zhang & Liu, 2025). The field would therefore benefit from a shift from predominantly descriptive questions about whether AI improves learner emotions toward more analytical questions concerning which AI affordances support which emotional outcomes, for whom, in what contexts, through which mechanisms, and over what

period of time. Such a shift would provide a stronger basis for developing theoretically grounded and empirically defensible models of emotionally responsive AI-assisted language learning.

3.2.1 Implications

The findings of this systematic review have significant implications for theory, educational practice, and future implementation of AI in English language education. By synthesizing evidence from 39 empirical studies, the review demonstrates that AI-assisted language learning influences not only learners' linguistic performance but also their emotional experiences, psychological well-being, and self-regulatory capacities. Such findings provide valuable guidance for researchers, curriculum developers, educators, educational institutions, and technology designers seeking to maximize the educational benefits of AI while minimizing potential challenges.

3.2.1.1 Theoretical Implications

The present review contributes to the theoretical understanding of learner emotions in AI-assisted ESL/EFL learning by bringing together four complementary perspectives: Control-Value Theory of Achievement Emotions, Positive Psychology, research on FLE and FLA, and the Affective Filter Hypothesis. Rather than treating these perspectives as competing explanations, the findings suggest that they can be integrated to explain different dimensions of learners' emotional experiences with AI-assisted language learning. Control-Value Theory (Pekrun, 2006) helps explain how learners' perceptions of control and the value of learning activities may shape their emotional responses; Positive Psychology provides a framework for understanding the development of positive psychological resources; FLE and FLA provide established constructs for examining positive and negative emotional experiences in second-language learning; and the Affective Filter Hypothesis (Krashen, 1982) helps explain how emotional conditions may facilitate or constrain learners' engagement with language input and interaction.

From the perspective of Control-Value Theory, the emotional consequences of AI-assisted learning may be partly understood through learners' perceptions of control over learning activities and the value they attach to those activities. The reviewed studies frequently associated AI-assisted learning with personalized practice, flexible pacing, immediate feedback, repeated opportunities for practice, and greater learner autonomy. These affordances may increase learners' perceived control because learners can regulate the pace, frequency, and sometimes the difficulty of their learning activities. When learners perceive themselves as capable of managing a learning task and consider that task valuable, positive achievement emotions such as enjoyment and confidence may become more likely. Conversely, uncertainty about AI-generated information, concerns regarding reliability, or insufficient knowledge about how to use AI appropriately may reduce perceived control and contribute to AI-related anxiety. The coexistence of increased enjoyment and reduced language anxiety with concerns about AI reliability and dependence can therefore be interpreted as evidence that learners' emotional responses may depend not simply on access to AI, but on how much control and value they perceive within AI-mediated learning activities. The present findings thus provide a theoretically useful basis for examining AI-assisted language learning through the control and value dimensions emphasized by Control-Value Theory (Pekrun, 2006).

The findings also reinforce the relevance of Positive Psychology to AI-assisted language learning. Across the reviewed studies, AI-assisted environments were associated with foreign language enjoyment, confidence, engagement, willingness to communicate, resilience, self-efficacy, and psychological well-being. These outcomes extend the traditional emphasis on negative emotions in second-language research by demonstrating that learners' positive emotional resources deserve equal theoretical attention. Importantly, the findings should not be interpreted as suggesting that positive emotions simply replace negative emotions. Rather, the evidence indicates that positive and negative emotional experiences can coexist within the same learning environment. A learner may experience greater enjoyment and confidence when practicing English with an AI system while simultaneously experiencing uncertainty about the accuracy of its responses or concerns about excessive dependence. This pattern is consistent with a broader multidimensional understanding of learner affect in which emotional experiences interact dynamically rather than functioning as mutually exclusive categories. The findings therefore support a Positive Psychology perspective that considers enjoyment, resilience, confidence, well-being, and other psychological resources as meaningful components of successful language-learning experiences.

The prominence of Foreign Language Enjoyment and Foreign Language Anxiety within the reviewed literature provides a further theoretical connection with established research on second-language emotions. FLE and FLA are related but distinct emotional constructs, and the findings suggest that AI-assisted learning may influence both through different mechanisms. AI-based conversational practice, for example, may reduce fear of negative evaluation by allowing learners to rehearse language repeatedly in a comparatively low-pressure environment. Such conditions may support greater willingness to communicate and contribute to higher enjoyment. At the same time, AI introduces a new dimension of uncertainty that is not necessarily present in conventional language-learning environments. Learners may question the accuracy of generated responses, become uncertain about appropriate AI use,

or worry about becoming overly dependent on technological assistance. Consequently, AI-assisted learning may simultaneously reduce language-related anxiety while creating technology-related concerns. This distinction is theoretically important because it suggests that reductions in FLA should not automatically be interpreted as evidence of an overall reduction in all forms of anxiety associated with AI-assisted language learning.

The Affective Filter Hypothesis (Krashen, 1982) provides another useful lens through which these findings can be interpreted. The reviewed studies frequently described AI-assisted environments as providing opportunities for repeated practice, immediate feedback, and interaction with reduced social-evaluative pressure. Such conditions may create a more psychologically supportive environment in which learners feel less apprehensive about making linguistic errors and are consequently more willing to participate. In this sense, AI may function as a potentially supportive condition for reducing affective barriers to language engagement. However, the same environment may become less supportive when learners experience uncertainty, frustration, excessive dependence, or concerns about the reliability and ethical use of AI. The Affective Filter perspective therefore complements the FLE/FLA findings by emphasizing that the emotional conditions surrounding language learning may influence learners' willingness and readiness to engage with learning opportunities. The present evidence does not establish a direct causal pathway through the Affective Filter framework, but it indicates that affective conditions remain theoretically relevant when interpreting learners' responses to AI-assisted language learning.

Taken together, these theoretical perspectives suggest an integrated interpretation of the emotional processes identified in this review. AI affordances such as personalization, immediate feedback, adaptive practice, conversational interaction, and flexible pacing may influence learners' perceptions of control and the value of learning activities. These perceptions may, in turn, be associated with emotional experiences such as enjoyment, confidence, engagement, and anxiety. Positive psychological resources may strengthen learners' capacity to persist and regulate their responses to challenges, while lower social-evaluative pressure may contribute to more favorable FLE and FLA experiences and potentially reduce affective barriers to participation. At the same time, technological uncertainty, inaccurate information, ethical concerns, and excessive dependence may undermine perceived control and introduce new negative emotional experiences. The emotional consequences of AI-assisted language learning can therefore be conceptualized as emerging from an interaction among technological affordances, learners' perceptions, individual characteristics, instructional conditions, and human mediation rather than from the technology itself.

This integrated interpretation also helps explain the apparent inconsistencies across the reviewed literature. If AI-assisted learning were inherently beneficial for learner emotions, positive outcomes would be expected to occur relatively consistently across technologies and contexts. The reviewed evidence does not support such a simple assumption. Instead, emotional outcomes vary according to the type of AI application, learning activity, learner characteristics, educational context, and degree of pedagogical support. Control-Value Theory helps explain how differences in perceived control and value may produce different emotional responses; Positive Psychology highlights the psychological resources that may be strengthened through supportive learning experiences; FLE and FLA distinguish between different forms of positive and negative second-language emotion; and the Affective Filter perspective emphasizes the importance of emotional conditions surrounding learners' engagement with language-learning opportunities. The convergence of these perspectives therefore provides a stronger theoretical explanation for why the same broad category of AI-assisted learning may produce enjoyment and confidence for some learners while generating uncertainty or anxiety for others.

Overall, the theoretical contribution of the present review lies not in proposing that one framework can independently explain all emotional outcomes associated with AI-assisted ESL/EFL learning, but in demonstrating the value of connecting complementary theoretical perspectives. The findings suggest that learner emotions should be conceptualized as part of a dynamic system in which perceived control, perceived value, positive psychological resources, language-specific emotions, and affective conditions interact with technological and pedagogical factors. Future empirical research should therefore move beyond examining isolated emotional variables and test theoretically informed relationships among AI affordances, perceived control and value, FLE, FLA, self-efficacy, engagement, well-being, and other affective outcomes. Longitudinal and mixed-method research would be particularly valuable for determining how these relationships develop over time and whether initial positive emotional responses to AI-assisted learning are sustained as learners become more familiar with the technology. Such theoretically integrated research could contribute to the development of more comprehensive models of emotionally responsive AI-assisted language learning.

3.2.1.2 Pedagogical Implications

The reviewed evidence offers several important implications for English language teachers and curriculum designers. First, educators should recognize that AI technologies are most effective when integrated

into pedagogically meaningful learning activities rather than employed solely as automated content-generation tools. Personalized feedback, adaptive learning pathways, conversational practice, and formative assessment appear particularly effective in promoting learners' emotional engagement while reducing communication anxiety.

Second, teachers should intentionally use AI to establish psychologically supportive learning environments. Because AI enables learners to practice English without fear of immediate social evaluation, it provides valuable opportunities for students who experience communication apprehension or low self-confidence. Carefully designed AI-assisted speaking, writing, and assessment activities can therefore complement classroom instruction by increasing learners' confidence and encouraging more active participation.

Third, despite the demonstrated benefits of AI-assisted learning, educators should avoid excessive dependence on AI. Human teachers remain indispensable for fostering empathy, providing emotional encouragement, facilitating collaborative learning, promoting critical thinking, and addressing ethical issues associated with AI use. Accordingly, blended instructional models that combine AI-supported learning with teacher guidance are likely to produce the most effective emotional and educational outcomes.

Finally, teacher education programs should incorporate professional development related to AI literacy, emotional pedagogy, and ethical AI integration. Enhancing teachers' confidence in using AI technologies will improve their ability to design emotionally supportive learning experiences while ensuring that technological innovation remains aligned with sound pedagogical principles.

3.2.2 Research Contributions

The findings also have practical significance for educational institutions, policymakers, and AI developers. Universities and schools should invest in reliable AI infrastructures that provide equitable access to high-quality AI-assisted learning environments while ensuring appropriate safeguards for learner privacy, ethical AI use, and data security. Educational policymakers should develop institutional guidelines governing the responsible implementation of AI technologies in language education. Such policies should encourage innovation while simultaneously addressing concerns related to academic integrity, algorithmic transparency, data protection, and the responsible use of generative AI within educational settings.

For AI developers, the reviewed findings highlight the importance of designing emotionally responsive learning systems that extend beyond traditional instructional support. Future AI applications should incorporate features that facilitate emotion regulation, personalized feedback, adaptive scaffolding, learner motivation, and psychological well-being (Barjesteh et al., 2026). The integration of affective computing technologies capable of identifying and responding to learners' emotional states may further enhance the effectiveness of AI-assisted language learning. Finally, educational institutions should establish collaborative partnerships among researchers, language educators, software developers, and policymakers to ensure that future AI systems are pedagogically sound, emotionally supportive, ethically responsible, and accessible to diverse learner populations. Such interdisciplinary collaboration will be essential for maximizing the long-term educational benefits of artificial intelligence while minimizing potential risks associated with its implementation.

3.2.3 Limitations

Although this systematic review followed a structured search, screening, quality appraisal, and synthesis process, several limitations should be acknowledged when interpreting its findings. First, the review included studies published between 2023 and 2026 and incorporated both peer-reviewed journal articles and four grey-literature publications. Including gray literature was intended to broaden the evidence base and reduce the potential influence of publication bias. Nevertheless, publication bias cannot be completely ruled out because studies reporting significant or favorable emotional outcomes may still be more likely to be published, indexed, or identified than studies reporting null or unfavorable findings. Therefore, the generally positive pattern observed across the reviewed studies should be interpreted with appropriate caution.

Second, the review was restricted to studies published in English. This language restriction may have resulted in the omission of relevant studies published in other languages, particularly given the international development of AI-assisted language learning. Consequently, the findings may not fully represent research conducted in non-English-speaking academic communities or published in local-language journals.

Third, the geographical distribution of the included studies was uneven, with a substantial proportion of the evidence originating from China and other Asian contexts. This concentration limits the extent to which the findings can be generalized across different cultural, educational, and institutional environments. Learners' emotional responses to AI may be shaped by cultural expectations, previous technological experience, educational traditions, and attitudes toward artificial intelligence. Further research across a wider range of geographical and cultural settings is therefore needed.

Fourth, the reviewed evidence was heavily concentrated in higher education, particularly university-level ESL/EFL contexts. Relatively little empirical research has examined emotional experiences associated with AI-assisted language learning among primary and secondary school students, vocational learners, adult learners, or learners in informal and

community-based settings. This concentration means that the findings should not automatically be generalized to younger learners or educational populations outside higher education.

Fifth, considerable methodological heterogeneity was observed across the included studies. Quantitative and quasi-experimental designs were prominent, while comparatively fewer studies employed longitudinal, qualitative, or mixed-method approaches. Many studies also relied substantially on self-reported measures of emotional experience and examined relatively short periods of AI use. Such characteristics limit the extent to which long-term emotional development, changes over time, or causal relationships between AI use and learner emotions can be established.

Finally, the emotional constructs and measurement approaches varied substantially across the included studies. Although foreign language enjoyment and foreign language anxiety were relatively prominent, other dimensions, including boredom, well-being, emotion regulation, resilience, confidence, and AI-related anxiety, were investigated less consistently. This variation makes direct comparison across studies difficult and limits the possibility of drawing a single overall conclusion about the emotional effects of AI-assisted ESL/EFL learning. Future research would benefit from theoretically informed, longitudinal, and methodologically diverse designs that examine multiple emotional dimensions across broader learner populations and educational contexts.

3.2.4 Suggestions

Future research must also explore the interaction between learner emotions and individual difference variables, including language proficiency, gender, age, learning styles, personality traits, cultural background, digital literacy, AI literacy, and previous experience with educational technologies. Understanding how these learner characteristics moderate emotional responses to AI will facilitate the development of more adaptive, personalized, and equitable instructional approaches. Moreover, future investigations should move beyond examining whether AI influences learner emotions toward exploring how, why, and under what conditions these emotional changes occur. Studies grounded in robust theoretical frameworks (including Positive Psychology, Control-Value Theory, Self-Determination Theory, Sociocultural Theory, and Technology Acceptance Model) would provide deeper explanations of the psychological mechanisms linking AI-assisted instruction with learners' emotional experiences. Combining quantitative analyses with qualitative evidence and learning analytics may further clarify these complex relationships. Finally, future systematic reviews and meta-analyses should continue to monitor this rapidly evolving field as new AI technologies emerge and empirical evidence expands. Comparative reviews examining different AI systems, educational levels, instructional contexts, and cultural settings will be particularly valuable for identifying best practices and informing evidence-based implementation of AI in language education, and such efforts will contribute to a more comprehensive understanding of how artificial intelligence can be designed and implemented to promote not only language achievement but also learners' emotional well-being, resilience, and long-term educational success.

4. CONCLUSION

AI is rapidly transforming English language education by creating learning environments that are increasingly interactive, adaptive, and learner-centered. While much of the existing literature has focused on the instructional effectiveness of AI technologies, the present systematic review demonstrates that their influence extends well beyond language achievement to encompass learners' emotional experiences, psychological development, and overall engagement with the language learning process. Drawing upon evidence from 39 empirical studies, this review synthesized current knowledge regarding learner emotions in AI-assisted ESL/EFL learning. The findings indicate that AI-supported learning environments generally enhance positive emotional outcomes (including foreign language enjoyment, willingness to communicate, engagement, self-efficacy, resilience, emotion regulation, and psychological well-being) while simultaneously reducing negative emotional experiences such as foreign language anxiety, writing anxiety, speaking anxiety, boredom, and communication apprehension. These findings suggest that learner emotions constitute one of the principal mechanisms through which AI contributes to successful language learning. The review further demonstrates that the emotional benefits of AI arise not simply from technological innovation but from the pedagogical opportunities that AI enables. Personalized instruction, immediate formative feedback, adaptive learning pathways, autonomous practice, and psychologically supportive learning environments collectively foster greater learner confidence, sustained motivation, and more active participation in English language learning. However, the evidence also indicates that AI should complement rather than replace teachers. Human educators remain essential for providing empathy, social interaction, ethical guidance, critical feedback, and the interpersonal support required for meaningful language learning. Another important contribution of this review is its multidimensional perspective on learner emotions. Rather than focusing exclusively on foreign language anxiety or enjoyment, the synthesis highlights a broad network of interconnected affective and psychological constructs, demonstrating that AI-assisted language learning influences emotional, motivational, and self-

regulatory processes simultaneously. This broader conceptualization advances current understanding of the relationship between AI and language learning while identifying promising directions for future theoretical and empirical research. Despite the encouraging findings, important challenges remain. Issues related to AI literacy, ethical implementation, privacy protection, information reliability, algorithmic transparency, and equitable access require continued attention from researchers, educators, policymakers, and technology developers. Addressing these challenges will be essential to ensuring that AI-assisted language learning remains pedagogically effective, emotionally supportive, and socially responsible. In conclusion, the evidence synthesized in this review indicates that artificial intelligence has the potential to become a powerful catalyst for emotionally responsive language education. When integrated within sound pedagogical frameworks and complemented by meaningful teacher guidance, AI technologies can create learning environments that not only improve English language proficiency but also nurture learners' confidence, resilience, well-being, and lifelong engagement with language learning. As AI continues to evolve, understanding and supporting learners' emotional experiences will remain fundamental to realizing the full educational potential of AI in ESL/EFL contexts.

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