

Artificial Intelligence in English Language Teaching: A Systematic Analysis of Global Trends

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الذكاء الاصطناعي في تدريس اللغة الإنجليزية: تحليل منهجي للاتجاهات العالمية

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Abstract

While existing applications of artificial intelligence (AI) in higher education are growing, so is the formal application of AI in the assessment of students. **Background:** Conventional assessment approaches fail to capture students' performance in more than one dimension. **Rationale:** AI can be used to develop evaluations that are more comprehensive, data-driven and equitable. **Objective:** The purpose of this study was to design and analyze an AI-based comprehensive evaluation model that includes attendance, research activities, seminars and exams. **Materials and Methods:** The method used is descriptive analytical design, and the data obtained in this study are institutional data of the faculty of education in Tripoli. Student performance indicators were used to develop integrated assessment outputs using AI-based algorithms. **Conclusions:** The AI model proved to be more effective in detecting performance patterns, improving prediction accuracy, and providing more balanced evaluation results than traditional approaches. **Discussion:** The results show how AI can enhance academic assessment, facilitate data-driven decisions, and mitigate bias, thereby fostering a fairer and more efficient evaluation process.

Keywords: Artificial intelligence, Student assessment, Higher education, English Language.

المخلص

في ظل التوسع المتزايد لتطبيقات الذكاء الاصطناعي في التعليم العالي، يبرز استخدامه في تقييم الطلاب كأداة لتجاوز قصور أساليب التقييم التقليدية التي تعجز عن قياس الأداء متعدد الأبعاد، وتوفير تقييمات أكثر شمولية، ودقة، وعدالة قائمة على البيانات.

الهدف: تصميم وتحليل نموذج تقييم شامل قائم على خوارزميات الذكاء الاصطناعي، يدمج عدة عناصر تشمل الحضور، والأنشطة البحثية، والحلقات الدراسية (السيمنار)، والامتحانات.

المنهجية والبيانات: اعتمدت الدراسة على المنهج الوصفي التحليلي، مستندةً إلى بيانات مؤسسية من كلية التربية بطرابلس لتطوير مخرجات تقييم متكاملة عبر خوارزميات ذكية.

النتائج والخلاصة: أثبت نموذج الذكاء الاصطناعي فاعلية أعلى من الطرق التقليدية في رصد أنماط الأداء، وتحسين دقة التنبؤ، وتقديم نتائج تقييم أكثر توازناً.

المناقشة: تسهم هذه النتائج في تعزيز التقييم الأكاديمي، ودعم اتخاذ القرارات القائمة على البيانات، والحد من التحيز، مما يوفر بيئة تقييم أكثر كفاءة وإنصافاً.

الكلمات المفتاحية: الذكاء الاصطناعي- تقييم الطلاب- التعليم العالي، اللغة الانجليزية.

1.INTRODUCTION

Artificial Intelligence (AI) is now no longer a niche application of technology in education, but has become a commonly used tool in the classroom, particularly in the field of English Language Teaching (ELT). The applications of AI to ELT range from various programs such as Automated Writing Evaluation (AWE) systems (e.g., Grammarly, Criterion) [1] through conversational chatbots [2] to adaptive learning programs [3] to speech-recognition

pronunciation tutors [4] and Large Language Models (LLMs) like Chat GPT that generate texts, support dialogic practice, and offer real-time feedback [5]. These technologies are pedagogically attractive because they enable teachers to provide immediate, individual and scaled feedback instantly; to pursue speaking out-of-class; and to free up time to focus on higher-order instruction, designing formative assessments, and creating creative curricula [1][2][5].

Systematic and bibliometric investigations reveal that research in AI for ELT has grown rapidly since approximately 2018, especially after the advent of the powerful LLMs in public use in 2022 [6][7][8]. A bibliometric content analysis, for example, identified the main streams of AI in language learning from 2017 through 2023 and how the research has become increasingly complicated with the integration of NLP-based agents [6]. In the same vein, some themes found in ELT research were personalization, learner autonomy and sociocultural bias [3]. Despite this expansion, geographic imbalances are evident, with the majority of the literature coming from East Asia and parts of Europe, and with relative lack of literature from Africa and Latin America [9].

Empirical studies of the use of AI in the field of ELT show a wide variety of learning outcomes. Research on AWE systems show gains in writing fluency and grammatical competence, but variable results have been found in terms of higher-order rhetorical awareness and greater coherence [10]. A detailed systematic review of the research on AI-enabled automated written feedback (1993–2022) found that there were both positive and neutral results for students' writing, as well as concerns for validity, usability, and whether effects could be transferred to other writing genres [11]. In the field of speech, intelligent tutoring systems and chatbots can provide certain benefits for improving pronunciation, fluency and learner motivation in speaking situations, but they are limited in their ability to respond contextually or pragmatically [12]. Besides, AI has been used to assist affective domains: A recent systematic review of EFL settings showed AI tools have the potential to impact learners' motivation and anxiety, yet it highlighted that the field is still quite underdeveloped and highly diverse [7].

As a teacher, there's excitement and apprehension. In general, English teachers who are not yet in service have positive attitudes regarding the use of chatbots, as they believe that the use of chatbots can help their students be more engaged and providing chances for students to practice conversation, but are also concerned about cheating, plagiarism, and the fact that the chatbot cannot replace human teachers [13][14]. Specifically, the ethical issues of using LLM in education (e.g., bias, transparency, data privacy) have been comprehensively examined and identified as significant obstacles [15]. Teacher readiness research indicates that teachers' AI knowledge is not yet sufficient: A large-scale empirical study on AI readiness of teachers conceptualized four dimensions of teachers' AI readiness (cognition, ability, vision, ethics) and showed that readiness significantly predicts the innovation of AI and job satisfaction [16]. Self-efficacy, training needs, and actual AI learning are also found to be significant indicators of the predictors of pre-service EFL teachers' adoption intentions, signifying that teacher preparation will be key to the successful integration of AI. Despite the rapid development of AI-ELT studies, there are some challenges that need to be addressed. Educators and institutions are still unable to deal with the concern of academic integrity, particularly with respect to the use of LLM [18][19]. The digital divide is also present and issues of unequal access to AI-powered tools have the potential to deepen inequities, especially in low-resource communities [20]. There is a lack of structured teacher training, as well as policy frameworks, for ethical and pedagogically appropriate integration [4][9]. Furthermore, from a global Englishes perspective, there are concerns of cultural and linguistic fairness in the use of AI: research indicates that the performance of generative AI can be sub-optimal in representing non-native varieties and perpetuating Anglo-centric norms [8].

With this backdrop, this paper provides a synthesis of empirical evidence (2013-2025) that aims to answer four interrelated research questions: (1) What are the AI tools being used in ELT and how? (2) What have the students learned (cognitive, linguistic, affective)? (3) Where is the bulk of the research generated and how is it changing geographically? (4) What problems, ethical questions and research questions do you have? To ensure transparency and replicability, the review follows PRISMA reporting guidelines [6]. By doing so, we seek to create a thorough and timely overview of the AI ELT landscape to identify fruitful areas of practice and policy and future research in the field [5].

2. MATERIALS AND METHODS

1. Study Design

The design of this study was a systematic review, using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020). The purpose of the review was to collate empirical studies on the use of Artificial Intelligence (AI) in English Language Teaching (ELT) and chart the trends in English-language research from 2013 to 2025. The protocol involved systematic search, screening, eligibility assessment, data extraction and thematic synthesis.

2. Search Strategy

Thorough multi-database search was carried out from January to March 2025. The databases used were selected as the most influential sources in the areas of applied linguistics and education, and computer-assisted language learning:

- Scopus
- Web of Science (Core Collection)
- ERIC
- ScienceDirect
- Google Scholar (supplementary search)

Search strings were created interactively through the use of a combination of Boolean operators, controlled vocabulary and key-words. The last searched string was:

(Artificial Intelligence OR AI OR machine learning OR deep learning OR large language models OR chatbots OR automated writing evaluation OR adaptive learning) AND (English language teaching OR English as a foreign language OR EFL OR ESL OR language learning).

You have selected the following search filters:

- 2013–2025
- Peer-reviewed journal articles
- Empirical studies (qualitative, quantitative and mixed-methods).
- English language publications

The reference lists of included studies were also hand searched for additional items (“snowballing”).

3. Eligibility Criteria

A priori, the inclusion criteria were set using the PICOS framework.

3.1 Inclusion Criteria

Studies were included if they:

1. Research into the use of AI-based tools (AIWES, Chatbots, Adaptive platforms, pronunciation tutors, or large language models).
2. Engaged EFL, ESL, ESP, K–12, university, adult learning with English language learner(s) or ELL teachers.
3. Empirical data (experimental, quasi-experimental, survey, case study, action research, or mixed methods) reported.
4. Analyzed cognitive, linguistic, affective or pedagogical outcomes
5. Published from 2013 – 2025 in peer-reviewed journals.

3.2 Exclusion Criteria

Articles that were excluded were:

1. Conceptual and/or theoretical papers, editorials, commentaries or book chapters.
2. Research that is not AI related (General CALL, VR/AR, Mobile learning without AI).
3. Research in language other than English.
4. Papers that do not have a full-text available
5. Non-peer-reviewed sources (Conference abstracts, theses, dissertations).

4. Screening Procedures

4.1 Initial Screening

All recovered records were added to Zotero to aid in reference management and deduplication. Titles/abstracts were screened by two independent reviewers for relevance. Disagreements were addressed through discussion, and in some cases, a third reviewer facilitated the process.

4.2 Full-Text Review

After initial screening, the full text of articles that met criteria were assessed using the eligibility criteria. A systematic documentation of the reasons for the exclusion was made (e.g., non-AI technology, non-ELT context, descriptive only, insufficient empirical data).

A flow diagram of the PRISMA for the identification, screening, eligibility and inclusion of studies was created.

5. Data Extraction

A table for extracting data was constructed in advance and then tested with 5 studies that were randomly selected. The last sheet of paper to be taken:

- You have to include bibliographic information (author, year, country).
- The type of AI tool used (AWE systems, chatbots, LLMs, adaptive learning platforms, speech-recognition tutors)
- Student population (Subject: English, Grade: 9th, EFL/ESL, Class size: large)
- Study design and methodology
- The characteristics of the sample (learner/teacher, proficiency, number)
- Intervention details (duration, tool functions and pedagogical purpose)
- Measured outcomes (linguistic, cognitive, affective, engagement and teaching practice)
- Key findings
- Limitations reported by authors

Two reviewers independently extracted data for reliability.

6. Quality Appraisal

The Mixed Methods Appraisal Tool (MMAT 2018) was employed as the tool that allows for the inclusion of qualitative, quantitative, and mixed methods designs common in ELT research to assess the methodological rigor. For each study five aspects were assessed (e.g., sample relevance, measurement appropriateness, data interpretation, integration of findings). No studies were excluded because of their appraisal scores, although they were weighted in the synthesis.

There was a high inter-rater agreement (over 85%) and disagreements were resolved by consensus.

7. Data Synthesis Approach

A narrative thematic synthesis was carried out because of the methodological diversity in the designs of the studies, types of AI tools and outcomes measures. Findings were sorted by three analytical dimensions:

1. Types of AI tools and their pedagogical applications
2. Learner outcomes and teacher outcomes, as observed
3. Geographical distribution, gaps and challenges in the research

Descriptive statistics such as frequency counts were used to summarise the types of tools, geographical trends and study designs as appropriate.

A meta-analysis is not included because of different methodologies and outcome measures.

8. Ethical Considerations

This research is a literature review of previously published peer-reviewed literature, so no ethical approval was needed. Despite this, the review was conducted in a transparent and repeatable manner and all studies were ascribed correctly.

3.RESULTS

Table 1. PRISMA 2020 Flow Summary of Study Selection (Text-Based Table)

Stage	Description	Number of Records
Identification	Records retrieved through database searching (Scopus, Web of Science, ERIC, ScienceDirect)	1,247
	Additional records identified through Google Scholar and reference lists	84
Screening	Records after duplicate removal	1,098
	Titles and abstracts screened	1,098
	Records excluded (not ELT, not AI, not empirical)	846
Eligibility	Full-text articles assessed for eligibility	252
	Full-text articles excluded with reasons (non-AI=71, non-empirical=39, wrong language=11, theoretical only=17)	138
Included	Studies included in qualitative synthesis	114
	Studies suitable for quantitative/descriptive synthesis	114

Commentary on Table 1

A detailed and transparent selection process is described in this PRISMA summary table. Only 114 studies (n = 1,331) fulfilled all of the eligibility criteria, meeting the rigorous conditions of empirical, AI-driven and ELT-specific research. The significant number of exclusions is indicative of the predominance of conceptual or non-AI CALL research in the area, and validates a need for systematic mapping of actual AI-ELT research.

Table 2. Distribution of Included Studies by AI Tool Type and Pedagogical Purpose

AI Tool Category	Specific Tools Reported	Primary Pedagogical Applications	Frequency (n=114)
Automated Writing Evaluation (AWE)	Grammarly, Criterion, Pigai, Write & Improve	Formative feedback, grammar correction, writing fluency	37
Chatbots & Conversational Agents	ChatGPT, Duolingo Bots, Replika, custom ELT chatbots	Speaking practice, vocabulary development, pragmatic competence	28
Adaptive Learning Systems	iTalki AI, MyEnglishLab, Kahoot AI modes	Personalized learning paths, difficulty adjustment	16
Speech-Recognition Pronunciation Tools	ELSA Speak, Google ASR, AI pronunciation tutors	Pronunciation accuracy, suprasegmental features	14
Large Language Models (LLMs)	ChatGPT, GPT-4, Claude, Bing AI	Text generation, reading comprehension support, scaffolding, content creation	19

Commentary on Table 2

The dominance of AWE systems and chatbots, as shown in this table, indicates that there is high, worldwide interest in enhancing writing and speaking abilities through AI. LLMs are rapidly growing in importance (19 studies since 2023) and suggest a paradigm shift from AI being a supporting element to an equal co-creator of content. There is still room for improvement in terms of pronunciation tools, which are less represented and encounter a constant technological hurdle in the automatic speech recognition (ASR) of various accents.

Table 3. Summary of Observed Learning Outcomes Across Included Studies

Outcome Type	Description of Findings	Number of Studies
Linguistic Outcomes	Improvements in grammar accuracy, lexical range, pronunciation, and writing fluency. Mixed results regarding coherence, critical argumentation, and pragmatic appropriateness.	72
Cognitive Outcomes	Enhanced learner autonomy, faster knowledge acquisition through adaptive feedback, improved error detection, increased metacognitive awareness.	41
Affective Outcomes	Higher motivation, reduced anxiety (especially with chatbots), improved engagement; some studies reported over-dependence and reduced critical thinking.	39

Teacher-Related Outcomes	Increased efficiency in feedback delivery, improved assessment consistency; but concerns about validity, plagiarism, ethics, and AI literacy gaps.	27
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Commentary on Table 3

Most research highlights positive linguistic outcomes such as writing, pronunciation, and vocabulary building, demonstrating the measurable effects of AI on language acquisition. Affective benefits, such as lower levels of anxiety and higher levels of engagement, are also significant, especially in EFL settings in which students may be reluctant to speak with actual language teachers. There is a dual pattern in teacher outcomes, not only with increased efficiency, but also with ongoing concerns around ethics and academic integrity, particularly of LLM-generated texts.

DISCUSSION

The results of this systematic review demonstrate the dynamic role of Artificial Intelligence (AI) in English Language Teaching (ELT), which is becoming more complex and advanced. As a whole, AI-assisted tools show significant potential to boost linguistic, cognitive and affective learning outcomes, but the effects do not show equal, uniform patterns across regions of the world and learning environments in general. The prevalence of Automated Writing Evaluation (AWE) tools and conversational chatbots in the studies included in this review is consistent with global studies that have found that the technologies that assist with writing and speaking are still gaining interest and attention in EFL contexts especially in Asia and the Middle East. AWE studies have found that the use of the tools improves writing fluency, grammatical accuracy, and revision behavior, but it has been noted that they are less effective at building higher-order writing coherence and critical writing skills [21, 22]. This review also reveals that although students often thrive on the use of automated corrective feedback, students' rhetorical growth can be hindered by surface error correction, and so the use of blended teacher-AI feedback is still necessary.

Since 2022, conversational agents such as chatbots and generative AI tutors based on large language models (LLM) have seen significant growth due to advancements in natural language processing (NLP) and the growing availability of generative AI systems. In line with the recent studies, the present review has revealed that Conversational AI can enhance speaking fluency, learner vocabulary development, and the confidence of learners in low-stakes practices [23, 24]. Several studies, however, suggest that chatbots still lack pragmatic appropriateness, turn taking and cultural nuances in their ability to emulate authentic communicative interactions [25]. This is particularly important in multilingual or intercultural settings, in which there may be strict rules of conversation that lead to unnatural or overly formulaic language production.

The studies reviewed reflect a notable trend of the increasing adoption of LLMs, moving beyond the basic feedback function to more complex applications like generation, summarisation, and personalized scaffolding. Studies indicate that LLM can help with comprehending text passages, generating ideas, and planning tasks, especially for intermediate-level learners [26]. However, there are ethical and pedagogical issues that are important. Several reviewed studies illustrate concerns about academic honesty, such as plagiarism using AI, AI-generated hallucination, and ambiguous sources of authorship [27], [28]. As educators become more uncertain about how to create assessments that are original enough to maintain the integrity of AI-supported learning, educators are increasingly unsure how to design assessments that allow for legitimate uses of AI while preserving their originality.

The lack of teacher readiness, and AI literacy remain significant challenges. While many teachers are interested in AI, few are technically competent or pedagogically trained for the meaningful use of AI in teaching, as evidenced in recent frameworks for teacher readiness and surveys [29] and [30]. However, if AI is not embedded in a comprehensive professional development plan, there is a risk of superficial or inconsistent use, which could further deepen

the divide between high-tech and low-tech settings. Moreover, research findings indicate that integrating AI into the curriculum is often unevenly distributed, lacking a clear strategy or being a random experiment for teachers, with only a portion of instructors adopting it. Additionally, research shows that only a small portion of teachers are using AI in the classroom, and it is not being integrated in a strategic way or even consistently used.

The disparities in geographic representation of AI-ELT are still significant. The empirical publications are dominated by East Asian, Gulf and parts of European contexts, which might be due to infrastructural, funding or digital literacy gaps in Africa and in Latin America. This imbalance has also been highlighted in recent global studies, which reveal a concentration of the advantages of AI-supported language learning in technologically advanced areas while key barriers for marginalized learners are growing [31] [32]. The importance of a more inclusive research agenda that encompasses linguistic diversity, low resource settings, and culturally responsible AI design is reinforced.

One of the newly emerging research areas is the affective dimension of AI tools, including motivational and engagement issues, and anxiety. Numerous studies reviewed support this notion that AI helps to alleviate learner anxiety, particularly for speaking activities due to the possibilities of doing them without judgment. This is in line with experimental findings that students do not seem to find AI tutors as intimidating as human teachers [33]. However, issues of dependency and lack of critical thinking are highlighted, particularly when students heavily rely on AI-generated responses without conducting critical evaluation [34]. Such a balance of AI support and metacognitive training is crucial and requires pedagogical frameworks to achieve this balance.

Last, but not least, the ethical implications of AI in education – such as transparency, bias, data privacy, and cultural fairness – are still part of the conversation. There are several recent studies that warn that AI systems have a tendency to mirror any underlying biases found in the data it has been trained on, which can result in the reinforcement of Anglo-centric norms and the marginalisation of non-standard forms of English [35]. The results of the present review are in keeping with what was observed: pronunciation tools and LLM-generated texts may sometimes have a preference for native-speaker accents and/or cultural references. As AI increasingly becomes a part of ELT, tackling these ethical concerns will be vital to fostering fairness and inclusivity.

Overall, the findings suggest that AI has the potential to revolutionize ELT, but it requires careful pedagogical integration, effective teacher preparation, and consideration of ethical and cultural issues. AI tools can be most helpful when used in tandem with, not instead of, human teachers and using guidelines that enable responsible use. Further studies should focus on the under-represented areas, longitudinal studies, culturally responsive AI models, and the creation of frameworks that promote critical, reflective, and equitable AI-enabled language learning.

Conclusion

When used wisely, AI has proven to be a game-changer in understanding and execution in the field of English Language Teaching that can provide significant improvements in writing production, fluency of speech, and motivation of learners. But its effectiveness varies by region, with insufficient access, teacher readiness, and technological infrastructure. Bias, transparency, and academic integrity are ethical issues that highlight the importance of responsible implementation. In fact, there is evidence that AI can be most effective when used in conjunction with, not in place of, human teaching. In summary, the strategic and equitable use of AI holds the potential of augmenting ELT outcomes and learners' experiences, on a large scale.

Recommendations

It is imperative for the educational sector to invest in systematic AI education initiatives to foster educators' digital and pedagogical capacities. Policymakers should set clear policies for promoting the ethical and responsible use of AI, particularly in the context of academic integrity and data privacy. The design of culturally responsive and unbiased AI tools should be directed towards the development of AI systems that are applicable across different linguistic contexts. Further studies are required in areas where they are under-represented, to secure benefits to the world at large. Last but not least, the use of AI, when integrated with reflective, critical, and human-centered pedagogies, can have the greatest impact on learning in the ELT curriculum.

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