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By Rishabh Deo

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Integration of Emerging Technologies and Large Language Models (LLMs) in English Language Pedagogy: An analysis of existing literature

**Rishabh Deo*

Introduction

The global landscape of education is currently experiencing a massive transformation driven by the proliferation of Artificial Intelligence (AI) and generative Large Language Models (LLMs). Within the domain of English language education, these technologies have evolved from supplementary tools into essential pedagogical drivers. This systematic literature review investigates how modern digital tools impact pedagogical strategies, learner outcomes, and the structural readiness of educators to adapt to AI-enhanced environments (Almufarreh et al., 2025; Tlili et al., 2023). For years, technology in language learning was largely framed around Computer-Assisted Language Learning (CALL) and mobile-assisted platforms aimed at improving digital literacy and expanding access (Alakrash & Razak, 2021; Cao et al., 2023). However, the introduction of conversational AI and generative models has initiated a shift toward hyper-personalized, dialogic learning environments.

These tools allow for interactive, student-centered pipelines that mimic human-like conversational scaffolding, offering dynamic support for early adolescents and higher-education students alike (Hu et al., 2024; Xu & Xiong, 2026). The integration of technology within English as a Foreign Language (EFL) contexts is no longer an optional innovation but a baseline requirement for contemporary instruction (An et al., 2022; Aleksieva et al., 2025). Modern language instruction demands active learning, critical thinking, and structured inquiry—all of which can be heavily augmented by conversational design choices, such as Socratic and narrative AI prompting (Chen et al., 2025; Xie et al., 2025). Furthermore, aligning LLMs with project-based and action-embedded pedagogy provides a vital bridge between theoretical language acquisition and practical application (Zhang & Zhang, 2024).

Despite the widespread availability of generative AI, significant gaps remain regarding policy frameworks, ethical integration, and multidimensional determinants of AI acceptance among both educators and students (Chan, 2023; Dahri et al., 2024). Studies frequently highlight disparate levels of digital competency and varying technological divides (Gong et al., 2025; Wang, 2025). A comprehensive synthesis is necessary to bridge the gap between students' self-regulated engagement and the structural readiness of teachers to guide that engagement productively.

Theoretical Framework

The theoretical basis of this review is derived from the so called Technological Pedagogical Content Knowledge (TPACK) paradigm first developed by Mishra and Koehler (2006). TPACK paradigm indicates that the use of technology in the classroom is not just the integration of

- Research Scholar, Faculty of Education (K), Banaras Hindu University, Varanasi, Uttar Pradesh, India.

digital tools to an existing curriculum. Therefore, a deep, intersecting, and highly contextualised grasp of three important domains is required: Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK) (Adipat, 2021; Başer et al., 2016).

In contemporary EFL/ESL teaching these areas overlap in very complicated ways:

1. **Pedagogical Content Knowledge (PCK):** Knowledge of how to teach English specifically e.g. using communicative language teaching (CLT) to explain complicated grammar or phonetics.
2. **Technological Content Knowledge (TCK):** Understanding the relationship between technology and English, such as how LLMs parse natural language, or how automated writing evaluation (AWE) systems detect grammatical problems.
3. **Technological Pedagogical Knowledge (TPK):** The capacity to identify the appropriate technology tools to assist specific pedagogical tactics, such as the use of AI-driven conversational agents to lower a student's emotive filter during speaking practice.

The goal for educators is the synthesis of all three of the TPACK. In EFL contexts, TPACK is a vital measure of pre-service and in-service teachers' readiness to integrate 21st-century digital skills and multimodal literacies into their classrooms (Loi, 2021; Tseng & Lin, 2025). In this paper, the framework is used to examine how educators navigate the cognitive and administrative transition from traditional static digital tools to autonomous generative AI models. Without high TPACK, teachers risk letting technology dictate the curriculum, instead of employing technology to support stated pedagogical goals.

Research

Question

How do emerging digital technologies and Large Language Models (LLMs) influence pedagogical strategies, educator readiness (TPACK), and student learning outcomes in English language education?

Research Objectives

1. To evaluate the impact of LLMs and generative AI on EFL students' language acquisition, academic writing processes, and overall motivation.
2. To assess English language teachers' technological pedagogical content knowledge (TPACK) and their behavioral intention or readiness to integrate these emerging digital tools into their classrooms.
3. To identify the pedagogical benefits, such as enhanced critical thinking, alongside the ethical challenges of using conversational AI and digital environments in English language instruction.

Research Methodology

The present analysis is carried out using a Systematic Literature Review (SLR) technique, which aims to produce a complete, unbiased and replicable synthesis of the extant empirical research. Systematic reviews are a very rigorous methodological technique, going beyond typical narrative reviews by using specific, established criteria to discover, appraise and synthesise literature (Gough, Oliver, & Thomas, 2017). Methodological Design and Search Strategy The present review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol and based on the standards of qualitative and systematic research methodologies (Flick, 2018). This provides a clear audit trail of how the data was obtained and assessed. We conducted a thorough search of electronic databases such as Scopus, Web of Science, ERIC and Google Scholar to identify peer-reviewed research published between 2016 and 2026. This period includes the stabilisation of the TPACK framework in contemporary literature and the explosive mainstreaming of generative AI in education. The search method was based on a combination of boolean operators and specific keywords: (("Large Language Models" OR "Generative AI" OR "ChatGPT" OR "Digital Competency") AND ("English Pedagogy" OR "EFL" OR "ESL" OR "Language Acquisition") AND ("TPACK" OR "Teacher Readiness")). Inclusion, exclusion and quality appraisal In order to preserve the rigour methodological scholars refer to (Flick, 2018), we delineated unambiguous inclusion and exclusion criteria. Studies were peer reviewed, authored in English, featured empirical data (quantitative, qualitative or mixed methods) and were focused directly on English language instruction or the technological competence of EFL instructors. We omitted opinion pieces, theoretical papers without data, and research that focused solely on hard STEM disciplines without a linguistic component. The selected literature is centred on human-LLM interaction design, cognitive performance measurements, and empirical evaluations of AI as a teaching partner (De Paula Cypriano De Souza et al., 2026; Furqon & Chang, 2025; Romero et al., 2025). Data extraction additionally included contextual characteristics such as the medium of instruction and global, multicultural citizenship perspectives in EFL to create a diversified, worldwide sample (Fang & Baker, 2018; Hennebry & Gao, 2018).

Thematic Analysis and Discussion

Theme 1: Impact of Generative AI on Learner Engagement and Motivation

Emerging data suggests considerable potential for large language models (LLMs) to assist with English language learning, particularly to improve academic writing skills. They're not only text generators. They also can deliver personalised, contextualised feedback throughout the writing process. This guide is designed to help students organise and improve the flow of their writing. However, other research warns that students may have trouble applying these scaffolded abilities to independent writing contexts when the AI support is not present (Borchers et al., 2026; Myung et al., 2025). Writing help has been connected with improved student motivation, engagement and academic

self-efficacy for generative AI. Conversational AI systems offer low-anxiety learning settings that promote experimentation and ongoing practice, hence improving students' motivation to engage in language-learning activities (Chiu et al., 2023; Li et al., 2025). The availability of this technology encourages independent and mobile learning, giving students the opportunity to request aid when needed, and to modify the level of support by AI according to their unique learning goals and academic duties (Hossain, 2026; Pan & Chen, 2021).

Theme 2: Teachers' Digital Competency, Readiness and TPACK

High enthusiasm among pupils but instructor preparation is highly variable. Although many teachers see the need for digital classrooms and mobile-assisted projects, real behavioural intention to use AI is often less than basic digital competency (Alieto et al., 2024; Lu et al., 2025). The research points to an ongoing requirement for the development of teachers' pedagogical attitudes towards AI. For a successful implementation, it is necessary that the educators change their self-efficacy beliefs from passive content deliverers to facilitators of AI-assisted, process-oriented communication (Meirovitz et al., 2022; Metzner et al., 2025).

Theme 3: Balancing benefits and cognitive and ethical challenges

However, generative AI also brings about unique ethical tensions even while it offers exceptional dialogic social learning capabilities and cognitive advances (Essel et al., 2023; Shahzad et al., 2024) AI-augmented "copilot" systems can provide lesson plan ideas and feedback that are comparable to those of human specialists, but require continual human oversight to ensure reliability and academic integrity (Dennison et al., 2025; Nygren et al., 2025). Finally, the integration of these technologies should be based on critical pedagogy, such that AI optimisation promotes mental health, inclusivity, and transparent educational goals across different populations (Zaimoğlu & Dağtaş, 2025; Zhang, 2025).

Major Findings

1. LLMs transform the iterative drafting process of EFL learners by delivering adaptive, real-time feedback, shifting the focus from grammatical mechanics to higher-order cognitive organization.
2. TPACK Gaps: Noticeable gaps in the readiness of educators. worldwide technological knowledge (TK) is slowly expanding. But the ability to successfully use AI into targeted language instruction, or technological pedagogical knowledge (TPK) requires much targeted professional development.
3. Engagement vs. Reliance: The students were more motivated and less anxious while using AI technologies to learn languages. However, without clear "reliance negotiation frameworks" set by teachers, pupils' risk cognitive outsourcing and procedural over-dependence on the AI.

Educational Implications

The findings of this systematic review provide key, actionable implications for stakeholders at all levels of education:

Curriculum Design and Policy: It is no longer possible for educational institutions to simply ban or ignore generative AI. AI Literacy must become a core ability in the curriculum alongside traditional language abilities. Policies should move away from punitive measures around AI use to constructive guidance that teaches students how to prompt responsibly and cite AI help publicly.

Teacher Training and Professional Development: Pre-service and in-service training has to move away from generic “software tutorials” to the intersections of TPACK only. Teachers require hands-on seminars that explain how to employ AI as a co-teacher, such as leveraging LLMs to rapidly tailor reading materials for mixed-proficiency classrooms or creating dynamic scaffolds for Socratic discourse in speaking assignments.

Assessment Redesign In an era of AI, take-home essays and product-based tasks are increasingly vulnerable to academic dishonesty. Language testing has to be more process oriented. Portfolio-based marking, collaborative in-class writing workshops, and live oral defense of written work will guarantee that students are internalising language structures rather than outsourcing their intellect to a machine.

Conclusion

The use of modern technology and Large Language Models (LLMs) signifies a watershed point in English language instruction. The systematic literature review shows that when rightly used, these advanced tools have the potential to democratise language acquisition. They provide hyper-personalized, 24/7 conversational scaffolding that greatly reduces learner fear, enhances intrinsic motivation, and guides the academic writing process for higher-order critical thinking.

But the degree to which these benefits are achieved depends very much on the structural preparation of the educators who are to employ them. The literature seems to suggest that today’s teachers are critically lacking in Technological Pedagogical Content Knowledge (TPACK). Basic digital literacy is developing more faster than the educational capacity to deal with the ethical dilemmas, algorithmic biases and dangers of student cognitive reliance.

Ultimately, technology cannot substitute for the nuanced, culturally appropriate direction of a human educator. The future of English Language Teaching is not an AI takeover; it is human-AI partnership. For institutions to effectively educate EFL learners for a digitalised global context, attention needs to be paid to holistic AI policy structures, to rethinking assessment models to

reward process rather than product, and critically, to increasing their teachers' pedagogical capacity building.

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