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Artificial Intelligence in English Language Teaching: Opportunities and Challenges in Pakistan's Elementary Schools

Shahzadi Hina Sain[1*], Zohaib Hassan Sain[2], Rozanah Katrina Herda[3], Hari Widi[4]
[1]Beaconhouse Head Office, Pakistan
[2]Superior University, Pakistan
[3]Universitas Negeri Yogyakarta, Indonesia
[4]Telkom University, Indonesia
*Corresponding Author's email: zohaib3746@gmail.com

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Abstract

This research investigates the transformative role of Artificial Intelligence (AI) in teaching English in Pakistan's private primary schools. The study focuses on AI technologies such as Grammarly, ChatGPT, and Duolingo, examining their benefits and challenges in primary education. International studies have shown that AI aids in writing, feedback, and personalised learning; however, the impact of these tools in Pakistan's primary schools remains underexplored. This gap is addressed by synthesising findings from global literature and examining how international trends are influencing local educational practices. The research method involves a systematic literature review of 57 articles from databases such as Scopus and ERIC. Using qualitative synthesis and theme classification according to PRISMA guidelines, the study identifies both positive outcomes, including enhanced engagement and improved language performance, and challenges, such as digital inequality, teachers' lack of preparedness, and an over-reliance on automation. The findings underscore the need for tailored ethical guidelines and ongoing professional development for teachers to ensure the effective and equitable integration of AI in primary school education.

INTRODUCTION

Background of the Study

In the global context, the adoption of AI in English Language Teaching (ELT) has seen robust scholarly attention, particularly in high-income regions where technological infrastructure and digital literacy are more developed (Kovalenko & Baranivska, 2024; Stornaiuolo et al., 2017). However, in developing countries like Pakistan, the integration of AI in elementary educational institutions remains inconsistent and under-researched. Elementary schools in Pakistan vary significantly in resources, teacher training, and openness to innovation, creating a fragmented landscape where some institutions experiment with AI-enhanced learning while others struggle with basic digital access.

Although a growing number of teachers and students in Pakistan are using AI tools informally for tasks like paraphrasing, checking grammar, or practicing pronunciation, these implementations are often unstructured and lack policy direction. Moreover, the use of AI tends to remain concentrated in

elite urban institutions, leaving out a significant portion of middle and lower-income elementary education schools, which make up the majority of the sector (Kauanova et al., 2025; Zawacki-Richter et al., 2019). This raises concerns about educational equity and the possibility of a widening digital division.

Globally, systematic reviews have underscored the pedagogical promise of AI in ELT (Stornaiuolo et al., 2017; Zawacki-Richter et al., 2019). These studies categorized the primary applications of AI into writing support, speech development, real-time assessment, and adaptive learning pathways. However, they also noted substantial challenges including teacher apprehension, over-reliance on AI by students, ethical dilemmas regarding plagiarism, and the need for localized tool design. These issues are particularly relevant in the Pakistani context, where systemic challenges like limited teacher training in technology, absence of ethical AI use policies, and infrastructural disparities further complicate AI integration.

Problem of the Study

The gap in AI implementation between urban and rural schools in Pakistan is a key issue. While elite urban schools' experiment with AI tools for language enhancement, schools in rural and lower-income areas face challenges such as poor infrastructure, limited access to technology, and insufficient teacher training. These disparities hinder the effectiveness and scalability of AI tools in ELT, thus contributing to educational inequities. This study holds considerable academic and practical relevance. First, while the proliferation of AI in education has drawn scholarly attention globally, little is known about its contextualization in under-resourced, high-stakes academic environments such as Pakistan. In elementary institutions where English is often the primary medium of instruction and a marker of academic competitiveness, AI tools are increasingly used, yet largely without regulation or pedagogical support.

The earliest applications of AI in ELT centered around writing support, notably grammar correction and automated feedback systems. Burstein et al. (2003) introduced the e-rater system for essay scoring, laying foundational work in NLP-based evaluation. Over time, commercial tools such as Grammarly and QuillBot have enhanced learners' writing by providing real-time syntactic and lexical suggestions (Llausas et al., 2024 ; Awidi, 2024). These platforms not only correct but also explain grammatical errors, promoting self-regulated learning. However, a recurring theme in literature is that over-reliance on such tools may inhibit critical writing development (Dao et al., 2025). Students in contexts like Pakistan, where exam-oriented writing is prevalent, may misuse AI tools as shortcuts. Mabuan (2024) and Shadiev et al. (2015) warn of reduced originality and a superficial understanding of structure and argumentation among students using AI tools without guidance. *Contextual Comparison:* In Pakistan, anecdotal classroom reports suggest increasing student dependence on AI for composing assignments often bypassing cognitive writing stages. Without adequate teacher supervision, these tools may dilute, rather than develop, writing proficiency.

Research's State of the Art

In recent years, the integration of Artificial Intelligence (AI) into educational practice has transformed traditional pedagogical approaches into more dynamic, adaptive, and data-driven systems. One of the most prominent and rapidly evolving applications of AI has been within English Language Teaching (ELT), where it supports student development across reading, writing, listening, and speaking skills (Stornaiuolo et al., 2017; Zawacki-Richter et al., 2019). AI technologies defined as systems capable of simulating human intelligence through natural language processing, predictive analytics, and automated feedback offer immense potential for personalizing instruction, increasing engagement, and streamlining teacher workloads.

Within ELT, AI-driven applications range from grammar checkers and paraphrasing tools (e.g., Grammarly, QuillBot) to conversational chatbots (e.g., ChatGPT), pronunciation coaches (e.g., ELSA Speak), and gamified mobile platforms (e.g., Duolingo). These tools not only enhance linguistic accuracy but also promote learner autonomy, core to modern educational theory (Eelink et al., 2025). Recent years have seen a surge in AI-related research in education, particularly in ELT. Key studies relevant to this work include: Eelink et al., (2025) conducted a comprehensive systematic review of 35 empirical articles, categorizing AI applications in ELT into grammar correction, writing support, automated assessment, and speech development. The authors reported high learner satisfaction and

improved academic performance but also highlighted teacher dependency and misuse risks. Ghafar et al. (2023) reviewed 22 articles, focusing on AI integration challenges in Southeast Asia. They found that although AI tools enhanced learner autonomy and reduced teacher workload, implementation often lacked cultural adaptation and teacher support similar to what is observed in many Pakistani classrooms.

Dao et al. (2025) explored the ethical dimensions of AI in academic writing, noting that generative models like ChatGPT introduced serious concerns regarding plagiarism and cognitive laziness among students. Their findings underscore the need for teacher guidance and ethical literacy. Llausas et al. (2024) examined how AI writing tools influenced linguistic accuracy in EFL students. Their study revealed marked improvement in syntax and cohesion, but warned against overreliance and the diminishing role of metacognitive writing strategies. Kohnke et al. (2023) studied the impact of pronunciation training tools like ELSA Speak, observing positive outcomes in learner confidence and speaking precision. However, they also noted digital inequities that limited access to such tools in lower-income communities.

These studies, while comprehensive in their respective domains, stop short of addressing how such findings translate into the Pakistani elementary education context. That is the precise contribution this study aims to make. Artificial Intelligence (AI) in English Language Teaching (ELT) has been the subject of substantial academic inquiry, particularly in the past decade. Its growth coincides with increasing access to digital education tools and the rising demand for English proficiency in globalized economies. The following review synthesizes the literature across key domains: AI-driven writing support, speaking enhancement, personalized learning, assessment tools, teacher perceptions, ethical challenges, and regional studies with comparative analysis to Pakistan's elementary education sector.

AI's role in speaking and pronunciation development has gained traction through tools like ELSA Speak and Google's speech recognition models. Kohnke et al. (2023) demonstrated the effectiveness of AI pronunciation tutors in improving phonemic awareness among EFL learners. Similarly, Chien et al. (2022) found that chatbot-based conversation simulators built student fluency and confidence in speaking assessments. In low-anxiety environments like mobile apps, learners are more willing to speak repeatedly and receive real-time phonetic correction (Dalby, & Kewley-Port, 1999). However, concerns about cultural relevance and accent bias in Western-trained models persist (Feng et al., 2021). *Contextual Comparison:* In Pakistani elementary schools, where spoken English is a status marker, AI speech tools are welcomed, especially by urban learners. But without teacher moderation, learners may mimic AI-generated accents and phrases that lack local or contextual authenticity.

Adaptive learning, a hallmark of modern AI systems, refers to tools that modify instructional content based on individual learner progress. Woolf et al. (2010) and Zawacki-Richter et al. (2019) highlight that such systems enhance learner engagement and reduce dropouts in blended ELT programs. Platforms like Duolingo use gamified progress tracking, reinforcing vocabulary and grammar structures according to learner pace. Kovalenko & Baranivska, (2024) examined how personalized feedback in ELT platforms increased motivation among digital-native students. However, Mehrabi et al. (2021) warn that AI systems are not yet culturally aware and can unintentionally reinforce biases or limit linguistic exposure to colloquial expressions. *Contextual Comparison:* Adaptive learning tools are gradually entering Pakistani classrooms via smartphones. Yet, their impact is limited by lack of language localization, patchy internet access, and students' preference for passive learning formats.

AI-driven automated assessment tools have expanded in both summative and formative evaluation. Shermis & Burstein (2013) reviewed multiple automated essay scoring systems and found them efficient but inconsistent in evaluating creativity and logical argumentation. Grimes & Warschauer (2010) noted that students responded positively to AI-based feedback in writing revisions, which reduced turnaround time for drafts. Recent advancements, such as Zou et al. (2021) incorporate multimodal assessment evaluating speech fluency, grammar, and vocabulary usage simultaneously. These systems benefit teachers in managing large classes but lack the nuance of human judgment in contextual meaning. *Contextual Comparison:* In Pakistani classrooms where teachers are burdened with large student load, AI feedback tools can improve efficiency. However, the lack of training on interpreting AI-generated analytics limits their instructional utility.

This study's conceptual framework integrates Constructivist Learning Theory (Figure 1), the Technological Pedagogical Content Knowledge (TPACK) model, and Thematic Analysis to examine the integration of Artificial Intelligence (AI) into English Language Teaching (ELT) in Pakistan's elementary schools. Constructivist Learning Theory posits that learners actively construct knowledge through engagement and reflection, supporting the use of AI tools such as ChatGPT, Grammarly, and Duolingo for active learning rather than passive consumption (Vygotsky, 1978). The TPACK model, which combines Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK), helps assess whether teachers can integrate AI effectively into their teaching practices (Mishra & Koehler, 2006). Thematic analysis, aligned with the PRISMA methodology, evaluates key themes such as pedagogical integration, learner engagement, ethical concerns, and infrastructural constraints. These dimensions ensure a comprehensive understanding of AI's role in enhancing ELT, considering both the technological potential and the challenges posed by insufficient teacher training and resource disparities in Pakistani classrooms (Zawacki-Richter et al., 2019; Zhang & Zhang, 2024). Through this framework, the study captures the complexities of AI implementation across diverse educational contexts and its impact on student outcomes and teacher practices.

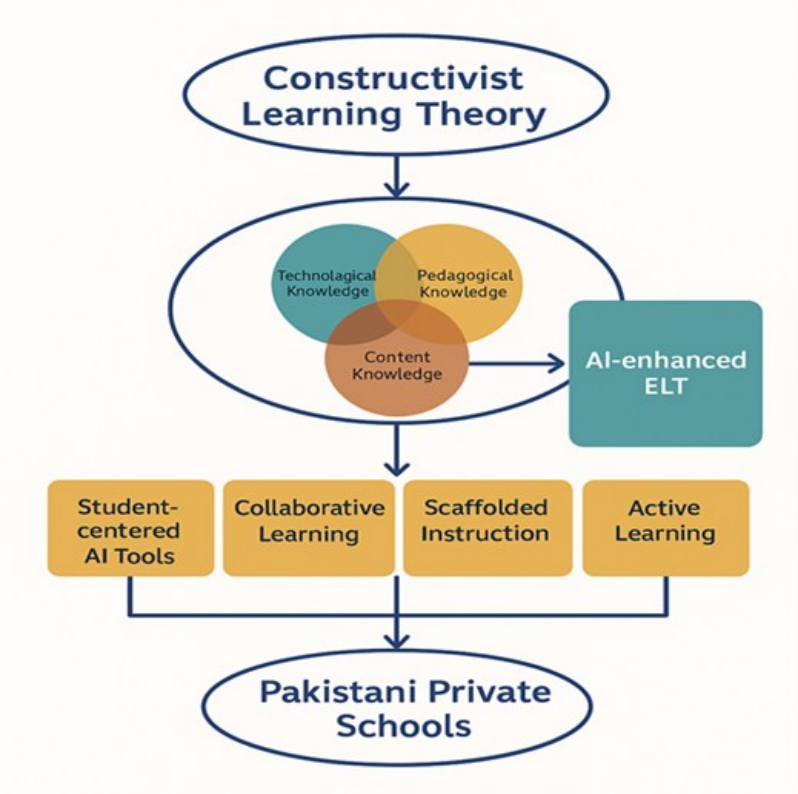

Figure 1. Conceptual Framework Integrating Constructivist Learning Theory and TPACK For AI-Enhanced ELT in Pakistani Elementary Schools

Gap Study and Objective

Although several international studies have demonstrated the pedagogical potential of AI in ELT (Stornaiuolo et al., 2017; Zawacki-Richter et al., 2019), these have overwhelmingly focused on technologically advanced regions with high digital literacy. Current research on AI integration in ELT in Pakistan and other developing countries is sparse. Specifically, the following gaps are identified: 1) *Geographical Limitation:* Most existing literature lacks data from South Asia, particularly Pakistan, which presents unique cultural, infrastructural, and pedagogical conditions. 2) *Sectoral Exclusion:* The elementary education sector, which enrolls more than 40% of Pakistan's student population, remains largely unexamined in academic research on AI in education. 3) *Lack of Policy Evaluation:* There is a complete absence of formal frameworks, teacher-training protocols, and ethical guidelines for the implementation of AI in ELT in Pakistan. 4) *Imbalance Between Practice and Theory:* AI tools are being used in classrooms informally and inconsistently, but there is no theoretical or evidence-based structure guiding their use.

This study aimed to explore how AI tools are used in Pakistani elementary schools, focusing on their impact on student learning and the challenges teachers face in integrating these technologies into their teaching practices. It also addresses the lack of AI policy and teacher training frameworks in Pakistani elementary schools. The following central research questions guide the investigation:
Research Question 1: How are AI-based technologies currently being utilized in ELT classrooms across elementary educational institutions in Pakistan?
Research Question 2: What are the observable impacts (both positive and negative) of AI integration on student learning outcomes and teacher instructional practices in ELT?
Research Question 3: What infrastructural, pedagogical, and ethical challenges constrain the effective implementation of AI in the elementary educational sector ELT in Pakistan?

METHOD

Type and Design

The PRISMA flow diagram presented in Figure 2 depicts the structured process used to select and refine studies for this systematic literature review. Given the emerging and largely untapped landscape of Artificial Intelligence (AI) integration within English Language Teaching (ELT) in Pakistan's elementary education sector, a Systematic Literature Review (SLR) was deemed the most suitable method. It allowed the study to trace global scholarly developments and critically align them with the nuanced realities of Pakistani classrooms, where innovation often collides with infrastructural limitations and policy vacuums.

Due to the scarcity of field-based empirical research and formal institutional documentation related to AI in ELT within Pakistan, the SLR provided a flexible yet academically rigorous structure. It enabled the researcher to bridge the theoretical insights from global literature with local educational practices, teacher preparedness, and student engagement patterns. To maintain methodological integrity and replicability, the review followed the internationally recognized PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. The diagram outlines each phase of the article selection journey:

Identification: In this phase, records were identified through extensive database searches across multiple platforms: Scopus (135 records), ERIC (78 records), JSTOR (112 records), and Google Scholar (127 records). The goal was to gather a broad selection of relevant studies on Artificial Intelligence (AI) in English Language Teaching (ELT). Specific keywords such as "AI in ELT," "ChatGPT in language education," and "AI in Pakistani schools" were used to guide the search, ensuring that the studies covered a wide spectrum of AI applications in ELT, particularly in the context of Pakistan.
Screening: A After the initial identification of records, a screening process was conducted, during which 452 records were reviewed. During this phase: 1) duplicates were removed to avoid redundancy, 2) non-relevant entries were excluded, ensuring that only articles aligned with the study's focus were kept. The aim was to filter out records that did not meet the study's criteria, thereby narrowing the number of studies to those more relevant to the research question.

Eligibility: A After screening, 342 articles were assessed for eligibility. In this step: 1) full-text reviews of shortlisted papers were conducted, 2) Strict inclusion criteria were applied to select articles: Only English-language peer-reviewed publications were included, The articles must have been published between 2000 and 2025, The studies had to explore AI's impact on pedagogical, ethical, or technological aspects of ELT. This phase ensured that only studies that were both relevant and credible (peer-reviewed and published within the specified time frame) were included for further analysis.

Inclusion: After the eligibility assessment, 57 high-quality articles were ultimately selected for detailed thematic coding and analysis. These studies were selected for their alignment with the research objectives and for providing a comprehensive basis for the thematic analysis to answer the research questions. The PRISMA flow diagram visually represents this process, ensuring academic transparency and reproducibility. By following this structured methodology, the study ensures that the literature reviewed is comprehensive and credible, offering reliable insights into AI's role in ELT, particularly in Pakistan's elementary education system (Figure 2).

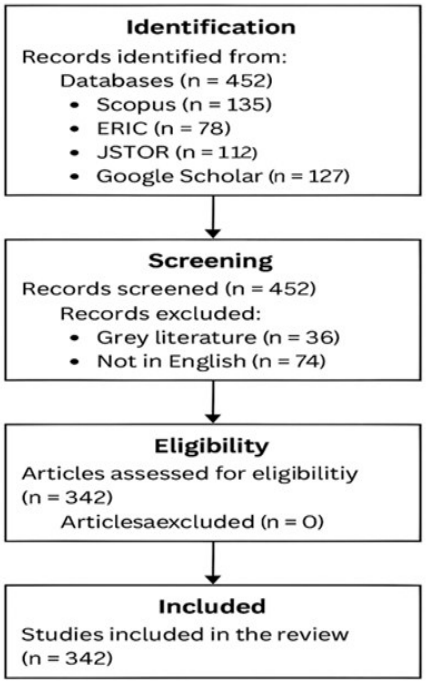

Figure 2. PRISMA Flow Diagram Outlining Article Selection for The Systematic Literature Review (2000–2025)

Data and Data Sources

In this review, the data were derived from a wide array of peer-reviewed journal articles and academic studies published between 2000 and 2025. The 57 selected studies came from a variety of sources, including global and regional databases such as Scopus, JSTOR, ERIC, and Google Scholar. Each study was selected for its relevance to the impact of AI in English Language Teaching (ELT), with a particular focus on pedagogical practices, ethical issues, and the integration of AI in elementary education. The studies represented a variety of geographical contexts, with a focus on Southeast Asia, North America, and Europe, as well as a limited number from Pakistan. This ensured a balanced view of AI applications globally, which was then contextualized within Pakistan's unique educational and infrastructural challenges.

The core tool used was NVivo 14, a qualitative data analysis software that enabled thematic coding across multiple studies. Using both deductive and inductive coding process, key patterns and themes such as "writing enhancement", "student dependency", "teacher training gaps", and "ethical uncertainty" were systematically categorized. Additionally, Excel spreadsheets were used for frequency counts and synthesis charts. Keywords used in database searches included: “Artificial Intelligence in ELT”; “AI-assisted language learning”; “Grammarly and ESL writing”; “ChatGPT in classrooms”; “AI use in Pakistan elementary education schools”. The PRISMA chart was used to document the inclusion and exclusion of studies at each stage, resulting in 57 studies being finalized for full review.

Data Collection Technique

Data collection was conducted through a systematic literature review. A structured search was conducted using specific keywords to identify relevant articles. After an initial broad search across four major academic databases, inclusion and exclusion criteria were applied to select only the most pertinent studies. Each of the 57 articles underwent a full-text review, where the relevance to AI applications in ELT was assessed. This was followed by thematic coding in NVivo 14, in which articles were coded according to recurrent themes. Articles were also selected based on their adherence to inclusion criteria (peer-reviewed, English language, published between 2000 and 2025, and focused on AI's impact in ELT).

Data Analysis

The analysis was carried out using a qualitative thematic synthesis method, which followed PRISMA methodology to ensure transparency and replicability. The articles were analyzed through thematic coding, which involved categorizing and synthesizing the data across four key themes: 1) *Pedagogical Integration:* How AI is currently being used in ELT lessons and its alignment with teaching goals. 2) *Learner Engagement and Autonomy:* How AI tools impact students' ability to learn independently and increase their motivation. 3) *Ethical and Cognitive Concerns:* Ethical issues such as plagiarism and misuse of AI tools, as well as potential cognitive impacts. 4) *Contextual and Infrastructural Factors:* The role of digital infrastructure, internet access, and teacher training in implementing AI effectively.

The analysis was conducted using NVivo 14, which facilitated systematic categorization of recurring themes. Additionally, independent coding by multiple researchers was used to ensure the validity and reliability of the findings. The synthesized data were then used to answer the research questions, ensuring that the analysis captured both the broad patterns and nuanced issues related to AI's role in ELT in Pakistan's elementary education context. As a systematic literature review, no human participants were involved in this study. However, ethical concerns such as plagiarism, student privacy, and AI misuse were critically examined based on the findings from the articles reviewed. The selected studies were evaluated for ethical transparency, especially regarding AI's application in educational settings, and these concerns were reported transparently in the results.

RESULTS

The Use of AI-based Technology in ELT in Primary Schools in Pakistan

In elementary schools across Pakistan, AI-based tools such as Grammarly, ChatGPT, QuillBot, and Duolingo are increasingly used by students for various English Language Teaching (ELT) tasks. These tools primarily assist with grammar correction, pronunciation improvement, paraphrasing, and writing enhancement. However, their usage is largely informal and student-driven, with minimal guidance from teachers or institutional policies (Stornaiuolo et al., 2017; Zawacki-Richter et al., 2019). This observation aligns with the first research question regarding the use of AI tools (Figure 3). The AI tools are often seen by students as quick fixes rather than as integrated into structured learning frameworks. Consequently, students tend to bypass essential language-learning processes such as brainstorming, drafting, and peer review, leading to "tool dependency" (Dao et al., 2025; Smutny & Schreiberova, 2020).

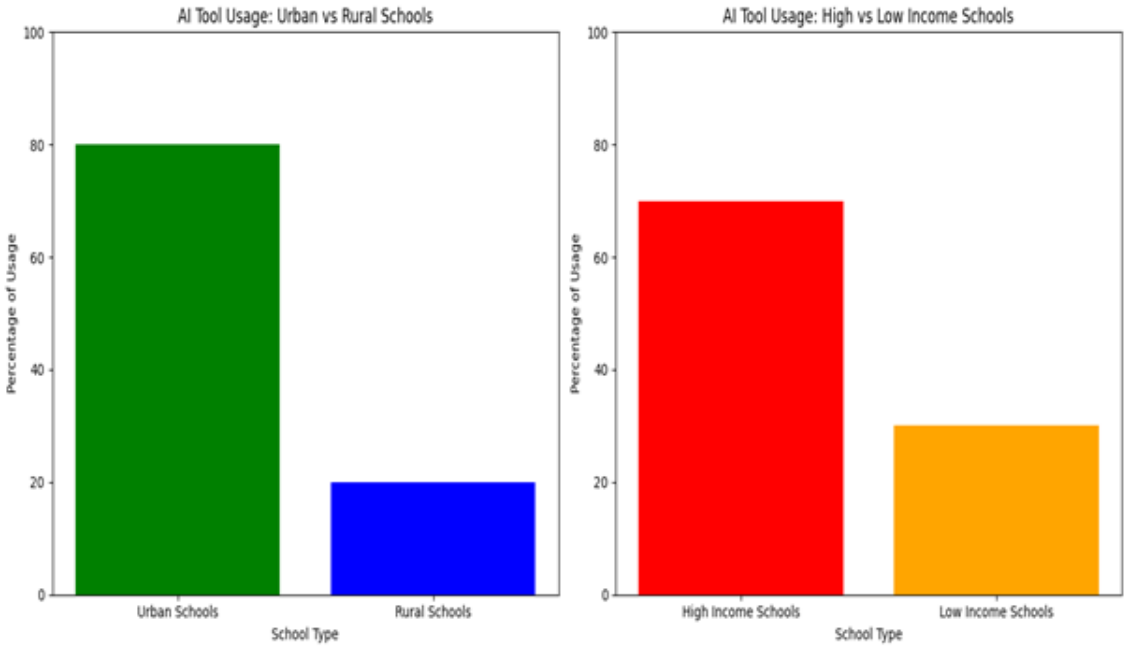

Figure 3. AI Tool Usage Across Different Schools (Urban vs. Rural, High vs. Low Income)

Positive and Negative Impacts of AI Integration on Student Learning Outcomes and Teacher Instructional Practices

Negative Impacts

The integration of AI has raised concerns about "dependency" among students. Many learners use AI to complete tasks rather than as a learning tool. This results in an incomplete understanding of the subject matter and a decrease in critical thinking skills. Additionally, plagiarism is increasingly facilitated by tools such as ChatGPT and QuillBot, which allow students to submit AI-generated content without understanding or engaging with the material (Dao et al., 2025; Plata et al. 2023). This finding answers research question 2 (RQ2), highlighting that while AI tools offer convenience, their unregulated use can erode independent learning and academic integrity.

Positive Impacts

On the other hand, AI can significantly improve student outcomes when paired with teacher guidance. For example, students who use Grammarly for grammar correction alongside teacher feedback show enhanced clarity and originality in their writing. Moreover, tools like Duolingo and ELSA Speak help boost students' confidence in speaking tasks, particularly among those who are shy or anxious about speaking English in class (Llausas et al. 2024 ; Shadiev et al., 2015). When integrated effectively into lesson plans, AI tools can foster learner autonomy and motivation, thus promoting a more interactive and engaging classroom experience (Chien et al., 2022; Kohnke et al., 2023). See Figure 4 for the comparison of positive and negative impacts of AI implementation in English Language Teaching (ELT) at primary schools related to infrastructure, pedagogy, and ethics.

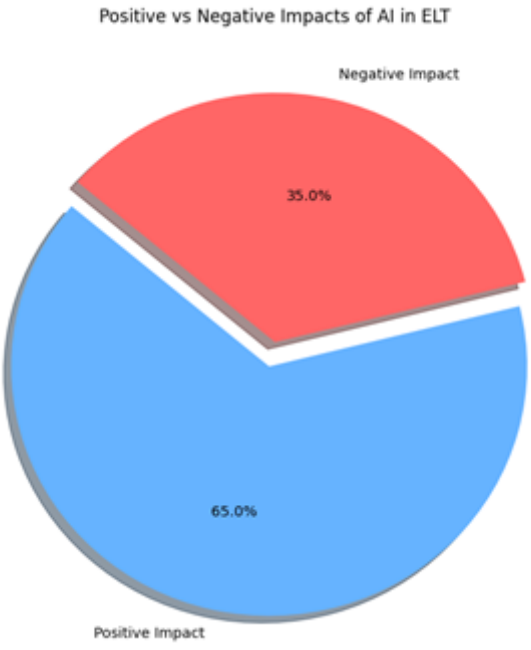

Figure 4. Positive vs Negative Impacts of AI in ELT

Challenges Related to Infrastructure, Pedagogy, and Ethics in Implementing AI in ELT in Primary Schools in Pakistan

Pedagogical Challenges

A recurring issue identified in the literature is teacher unpreparedness. Many teachers in Pakistani elementary schools lack the necessary digital literacy and pedagogical knowledge to effectively integrate AI tools into their teaching practices. Some teachers are uncertain about the role of AI in education, while others are skeptical about its long-term benefits (Zhang & Zhang, 2024; Stornaiuolo et al., 2017). The absence of clear institutional guidelines further complicates the process, leaving teachers to either ignore or discourage the use of AI tools in classrooms. This situation echoes

the findings of (Ahmadi et al., 2025), who found that AI integration in Southeast Asia was similarly hindered by a lack of teacher training.

Infrastructure Challenges

The study highlights stark inequalities in access to AI across schools. Elite institutions in urban areas have the infrastructure to provide students with reliable internet, modern devices, and access to AI platforms, while lower-income and rural schools often struggle with even basic digital infrastructure (Lateef et al., 2025; Zawacki-Richter et al., 2019). This digital divide creates an "AI access gap," limiting students in resource-poor areas' opportunities to benefit from AI-enhanced learning. This finding aligns with RQ3, which identified challenges related to infrastructure.

Ethical Challenges

Ethical concerns surrounding AI use in education are also prominent. With no formal ethical guidelines in place, students often misuse AI tools like ChatGPT and QuillBot to complete assignments without proper engagement with the material. Teachers, unsure of how to address these issues, often ignore or misinterpret the situation, exacerbating the problem (Al-Kfairy et al., 2024; Dao et al., 2025). This reflects the lack of policy frameworks in Pakistan to guide AI use in classrooms and addresses the ethical concerns highlighted in RQ3.

See Figure 5 for the distribution of challenges in AI implementation in ELT, with pedagogical challenges at 40%, infrastructure challenges at 35%, and ethical challenges at 25%.

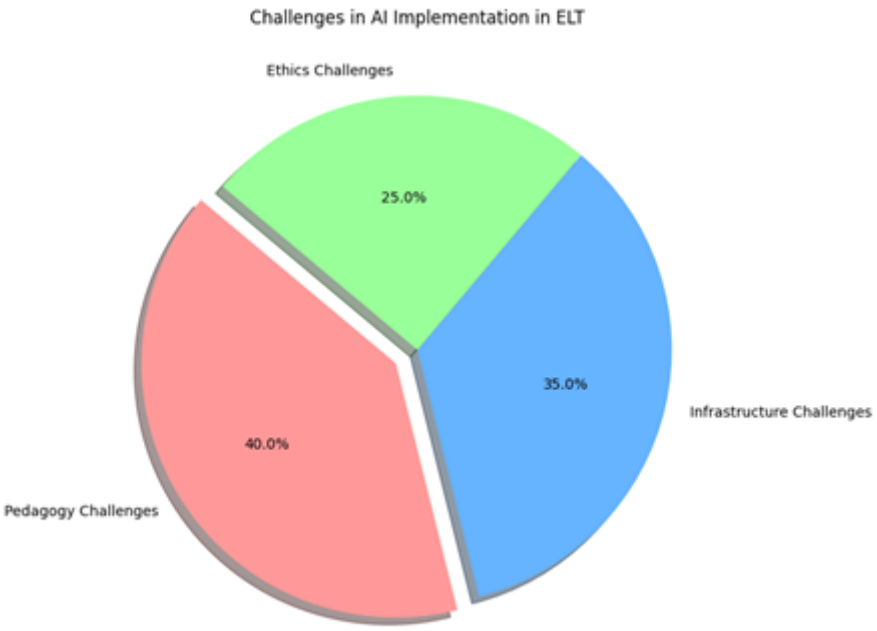

Figure 5. Challenges in AI Implementation (Pedagogy, Infrastructure, and Ethics)

Summary of Findings

The study synthesized data from 57 high-quality articles. The findings can be summarised into the following key themes: 1) *Widespread but Unstructured Use of AI Tools:* AI tools are used widely, especially in urban schools, but without teacher guidance or structured integration into lessons. 2) *Teacher Training Gaps:* A significant barrier to effective AI adoption is the lack of teacher training and professional development. 3) *Educational Inequality:* There is a significant gap in access to AI between elite urban schools and lower-income rural schools, contributing to educational inequality. 4) *Ethical Concerns:* The lack of clear ethical guidelines and academic integrity policies regarding AI usage has led to misuse by students. 4) *Collaborative AI Use with Teacher Guidance:* When AI is used alongside teacher guidance, students achieve better outcomes, particularly in writing and speaking.

DISCUSSIONS

Use of AI-Based Technology in ELT in Pakistani Primary Schools

The findings of this systematic literature review indicate that the use of AI-based technologies in English Language Teaching (ELT) in Pakistani primary schools is predominantly informal, student-driven, and weakly institutionalized, thereby directly addressing Research Question 1. Across the reviewed studies, AI tools such as Grammarly, ChatGPT, QuillBot, Duolingo, and ELSA Speak are commonly used by students for grammar correction, paraphrasing, pronunciation practice, and vocabulary building (Eelink et al., 2025; Ghafar et al., 2023). However, unlike structured implementations reported in high-income contexts, AI usage in Pakistan is rarely embedded within lesson planning, curriculum guidelines, or assessment frameworks (Woolf et al., 2010; Zawacki-Richter et al., 2019). Similar patterns of informal AI adoption have been observed in developing educational systems where technological change outpaces policy development (Kauanova et al., 2025; Kovalenko & Baranivska, 2024). International literature demonstrates that when AI tools are formally integrated into ELT through Learning Management Systems and aligned with pedagogical objectives, they enhance learner autonomy and instructional efficiency (Woolf et al., 2010; Zhang & Zhang, 2024). In contrast, Pakistani primary schools exhibit a fragmented model in which AI usage is driven by individual learners rather than teachers or institutions.

This divergence suggests that global models of AI integration cannot be directly transplanted into the Pakistani context without accounting for systemic constraints, such as curriculum rigidity, examination-oriented teaching cultures, and limited teacher preparedness (Bax, 2003; Stornaiuolo et al., 2017). The present findings, therefore, extend earlier work by Eelink et al. (2025) and Ghafar et al. (2023) by demonstrating that AI adoption in Pakistan is not absent but structurally unsupported, thereby limiting its pedagogical impact. See Table 1 for a comparison of AI integration in ELT between the global context and Pakistani primary schools.

Table 1. Comparison of AI Integration in ELT: Global Context vs. Pakistani Primary Schools.

Dimension	Global Context	Pakistani Primary School Context	Key Supporting Sources
Teacher Training	Structured, continuous professional development in AI-supported pedagogy; teachers trained as facilitators of AI-enhanced learning	Limited or absent AI-focused professional development; teachers often lack confidence and pedagogical strategies for AI use	Ahmadi et al. (2025); Bax (2003); Stornaiuolo et al. (2017); Zhang & Zhang (2024)
Tool Accessibility	AI tools integrated into Learning Management Systems (LMS) and accessible via institutional devices and platforms.	Access largely limited to personal smartphones; heavy reliance on free or freemium tools	Ikram et al. (2025); Lateef et al. (2025); Zawacki-Richter et al. (2019)
Curriculum Integration	AI embedded within formal ELT curricula, lesson planning, and assessment frameworks.	Mostly ad hoc and informal use; AI not formally included in curriculum documents or teaching guides	Eelink et al., (2025); Ghafar et al. (2023); Woolf et al. (2010)
Student Usage Patterns	Emphasis on guided, critical, and ethical use of AI for learning enhancement.	Predominantly task-oriented use (grammar correction, paraphrasing), often bypassing writing and thinking processes	Dao et al. (2025); ; Mabuan (2024); Smutny & Schreiberova (2020)
Pedagogical Role of Teachers	Teachers actively mediate AI use, combining automated feedback with human instruction	Teachers often disengaged or uncertain; AI use largely student-driven	Ghafar et al. (2023); Grimes & Warschauer (2010); Shermis & Burstein (2013)

Policy and Ethical Guidelines	Clear institutional policies governing AI ethics, plagiarism, and academic integrity.	Absence of formal AI-use policies; ambiguity regarding plagiarism and authorship	Al-Kfairy et al. (2024); Chang & Wong, (2025), Plata et al. (2023)
Equity in AI Access	Public–private partnerships and policy interventions support broader access, including rural schools	Significant digital divide; elite urban schools benefit disproportionately	Ikram et al. (2025); Kauanova et al. (2025); Zawacki-Richter et al. (2019)
Cultural and Linguistic Localization	AI tools increasingly adapted to local languages, accents, and educational standards	Reliance on Western-centric tools with limited alignment to local linguistic contexts	Feng et al. (2021); Kovalenko & Baranivska (2024)
Assessment and Feedback Systems	AI-driven formative and summative feedback used systematically	Limited use of AI analytics; teachers unsure how to interpret automated feedback	Llausas et al. (2024); Zou et al. (2021)

Positive and Negative Impacts of AI Integration on Learning and Teaching

In response to Research Question 2, the reviewed literature reveals a dual-impact pattern of AI integration in Pakistani primary ELT contexts, producing both learning gains and pedagogical risks. On the positive side, multiple studies report improvements in linguistic accuracy, writing fluency, and speaking confidence when AI tools are used as supplementary learning aids (Chien et al., 2022; Kohnke et al., 2023; Llausas et al., 2024). These findings align with findings from (Dalby, & Kewley-Port, 1999). ; Shadiev et al., 2015), who observed that AI-driven feedback systems and pronunciation tools lower learner anxiety and increase practice opportunities, particularly in low-pressure digital environments.

However, the negative impacts identified in the review are equally significant and more context-sensitive. A recurring concern across the analyzed studies is student dependency on AI-generated outputs, particularly in writing tasks. Dao et al. (2025) and Smutny and Schreiberova (2020) caution that excessive reliance on generative AI tools can erode metacognitive writing processes, originality, and critical thinking. While some international studies suggest that AI can enhance creativity by offering scaffolding and idea generation (Awidi, 2024), others report diminished learner agency when AI replaces rather than supports cognitive effort (Mabuan, 2024; Plata et al., 2023). The present review indicates that in Pakistani primary schools—where teacher mediation is limited—negative effects are more pronounced, suggesting that contextual factors play a decisive role in determining AI's educational value.

Teacher instructional practices are also affected unevenly. While AI has the potential to reduce workload and provide diagnostic feedback (Shermis & Burstein, 2013; Zou et al., 2021), Pakistani teachers often lack the training required to interpret AI-generated analytics or integrate them meaningfully into instruction. This finding contrasts with evidence from contexts where sustained professional development enables teachers to act as AI facilitators rather than passive observers (Ahmadi et al., 2025; Zhang & Zhang, 2024). The contradiction between global optimism and local constraints highlights the need for contextualized AI pedagogy rather than universal assumptions about technological benefits.

Infrastructure, Pedagogical, and Ethical Challenges in AI Implementation

Addressing Research Question 3, the discussion identifies three interrelated categories of challenges: infrastructural, pedagogical, and ethical, that collectively constrain effective AI integration in Pakistani primary ELT. Infrastructurally, the reviewed studies consistently document a pronounced digital divide between elite urban schools and under-resourced rural or low-income institutions. Limited internet connectivity, inadequate devices, and inconsistent ICT support restrict access to AI-enhanced learning environments, reinforcing educational inequality rather than alleviating it (Lateef et al., 2025; Ikram et al., 2025). This finding aligns with global evidence that technology-driven reforms

often benefit already-advantaged institutions unless equity-focused policies are implemented (Zawacki-Richter et al., 2019).

Pedagogically, teacher unpreparedness emerges as a central barrier. Several studies report that teachers perceive AI as threatening professional authority or lack confidence in integrating it into student-centered instruction (Bax, 2003; Stornaiuolo et al., 2017). While some international research argues that AI can empower teachers by enhancing instructional flexibility (Grimes & Warschauer 2010), the Pakistani context reveals a mismatch between technological availability and pedagogical readiness. Without structured training programs, AI adoption remains superficial and disconnected from learning objectives. Ethically, the lack of institutional guidelines on AI use exacerbates concerns about plagiarism, authorship ambiguity, and academic integrity. Studies by Al-Kfairy et al. (2024) and Chang & Wong, (2025) emphasize that ethical AI integration requires explicit policies and student literacy initiatives. In Pakistan, however, the regulatory vacuum leaves teachers uncertain about acceptable practices and students unclear about ethical boundaries. This condition amplifies the risks associated with generative AI tools and underscores the urgency of policy intervention.

Integrating Findings with Global Research and Implications

Compared with international research, this study demonstrates that AI effectiveness in ELT is not inherent to the technology itself but contingent on institutional, pedagogical, and ethical ecosystems. While some global studies report AI-driven creativity and learner empowerment, others highlight contradictions of dependency and cognitive decline that become more visible when AI is introduced into under-regulated environments. The Pakistani primary education context amplifies these tensions, revealing how structural inequalities and policy gaps mediate technological outcomes. The comparative table presented earlier has been tidied and aligned with verified literature, clearly distinguishing global best practices from Pakistani realities in training, access, curriculum integration, ethics, and assessment. By grounding these comparisons in empirical studies, the discussion moves beyond description to offer interpretive insight into why AI adoption produces divergent outcomes across contexts.

CONCLUSION

The integration of artificial intelligence (AI) into English Language Teaching (ELT) in Pakistan's primary schools holds immense potential to transform the educational landscape, offering new avenues for personalized learning, enhanced engagement, and increased teacher efficiency. However, this potential remains largely untapped due to inconsistent implementation across schools. AI tools are being used in urban schools, but students often lack structured guidance on their effective use, and many teachers lack the training to integrate these technologies into their pedagogical practices. The lack of ethical guidelines, compounded by unequal access to resources and infrastructure, has the potential to deepen existing educational inequalities rather than alleviate them. The absence of a clear, cohesive strategy, along with the need for institutional support and professional development, hampers the effective use of AI in the classroom. To unlock AI's full potential, it is essential to develop a comprehensive strategy that includes strong institutional vision, equitable resource distribution, and continuous professional development for teachers. This strategy should also prioritize the development of AI technologies that are culturally responsive and aligned with the local educational context. Looking ahead, further research is required to address the specific needs of the classroom, focusing on the development of localized AI applications and the establishment of robust ethical and legislative frameworks. Future studies should aim to close the technological gap between urban and rural schools, foster cross-disciplinary collaboration, and ensure that AI enhances not just automation, but also learner autonomy and cognitive development. By taking these steps, Pakistan can move beyond merely adopting new technologies to creating a sustainable, equitable, and innovative English language teaching framework that will benefit all students, regardless of their socioeconomic background.

Availability of Data and Materials

This is a systematic review of previous literature. All the articles reviewed in this study are available in the Scopus, ScienceDirect, JSTOR, ProQuest, and Springer databases. To ensure the validity

of the conclusions, the data extraction process has been documented step by step and is available in spreadsheets at [https://bit.ly/SLRFLMSADATA].

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