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Enhancing English Language Learning through Artificial Intelligence: Effects on Motivation and Reading Skills among College Students in Pakistan

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ABSTRACT

This study explores the impact of artificial intelligence (AI) on enhancing English language learning, with a particular focus on student motivation and reading skills among college students in Pakistan. In recent years, AI-powered tools such as intelligent tutoring systems, language-learning applications, and adaptive reading platforms have transformed traditional educational practices by offering personalized, interactive learning experiences. The present research aims to investigate how integrating AI into English language classrooms influences learners' motivation and improves their reading comprehension. A quantitative research design was employed, involving a random sample of college students. Data were collected using a structured questionnaire that measured students' levels of motivation and their perceived improvement in reading skills after exposure to AI-based learning tools. Statistical analysis revealed a significant positive relationship between AI use and increased learner motivation. Students reported higher engagement, interest, and confidence when interacting with AI-driven platforms compared to traditional teaching methods. Furthermore, the findings indicate that AI tools contribute significantly to the development of reading skills by providing instant feedback, adaptive content, and interactive exercises tailored to individual proficiency levels. These features enable learners to practice reading more effectively and independently. The study concludes that integrating AI into English language teaching can play a vital role in enhancing both motivation and reading proficiency among college students in Pakistan. It recommends that educators and policymakers incorporate AI-based strategies into curricula to create more effective and engaging language-learning environments.

Keywords: Artificial Intelligence, English Language Learning, Learner Motivation, Reading Skills, College Students, Pakistan, Educational Technology.

Introduction

The integration of technology in education has significantly transformed teaching and learning processes across the globe, and artificial intelligence (AI) has emerged as one of the most influential innovations in this domain. In the context of English language learning, AI-powered tools such as intelligent tutoring systems, chatbots, adaptive reading platforms, and automated feedback systems have opened new possibilities for enhancing learners'

engagement and performance. In countries like Pakistan, where English is a second language and a medium of instruction in higher education, improving students' proficiency remains a persistent challenge. Despite years of formal instruction, many college students struggle with basic language skills, particularly reading comprehension. This situation calls for innovative approaches that not only improve language proficiency but also enhance learners' motivation, which is widely recognized as a key factor in successful language acquisition (Dörnyei, 2001; Gardner, 1985).

Motivation plays a central role in second language learning, influencing learners' effort, persistence, and overall achievement. Traditional classroom environments in Pakistan often rely on teacher-centered approaches, which may fail to engage students actively and limit opportunities for meaningful interaction with the language (Shamim, 2008). As a result, students may develop low motivation and lack confidence in their language abilities. The introduction of AI-based learning tools offers a promising solution to this issue by creating interactive, personalized, and student-centered learning environments. AI technologies can adapt to individual learners' needs, provide instant feedback, and offer engaging content, thereby fostering intrinsic motivation and promoting autonomous learning (Holmes et al., 2019).

Reading skills, in particular, are crucial for academic success, as they enable students to access and comprehend a wide range of information. However, many Pakistani students face difficulties in reading English texts due to limited vocabulary, lack of practice, and insufficient exposure to authentic materials (Rahman, 2002). AI-powered reading platforms can address these challenges by providing customized reading materials, vocabulary support, and comprehension exercises tailored to learners' proficiency levels. Research indicates that such tools can significantly improve reading comprehension by offering immediate feedback and interactive learning experiences (Luckin et al., 2016). Moreover, AI can track learners' progress and provide data-driven insights, allowing teachers to make informed instructional decisions.

International research has highlighted the effectiveness of AI in enhancing both motivation and language skills. For instance, studies have shown that learners who use AI-based applications demonstrate higher levels of engagement and improved learning outcomes compared to those in traditional settings (Chen et al., 2020). Similarly, research by Wang and Petrina (2013) suggests that technology-enhanced learning environments can positively influence students' attitudes and motivation. In the field of language learning, AI-driven tools such as automated writing evaluation systems and reading comprehension platforms have been found to support learners in developing essential skills more efficiently (Liang et al., 2021).

In the Pakistani context, however, the integration of AI in education is still at an emerging stage. While some institutions have started adopting digital tools, the use of AI for language learning remains limited. Previous studies in Pakistan have primarily focused on traditional teaching methods and motivational factors, with little attention given to the role of advanced technologies in language learning (Mansoor, 2005). Furthermore, there is a lack of empirical research examining how AI influences both motivation and specific language skills, such as reading, among college students. This gap underscores the need for context-specific studies that explore the potential of AI to improve English language education in Pakistan.

The problem addressed in this study is the low level of English proficiency, particularly in reading, among college students in Pakistan, despite the recognized importance of English for academic and professional success. Traditional teaching methods have not been sufficient to address this issue, and there is a need to explore innovative approaches that can enhance both motivation and learning outcomes. While AI has shown promise in other contexts, its effectiveness in the Pakistani educational setting remains underexplored.

The aim of this research is to investigate the effects of artificial intelligence on learner motivation and reading skills among college students in Pakistan. The study seeks to determine whether AI-based tools can enhance students' engagement and improve their reading comprehension. In doing so, it aims to contribute to the growing body of literature on technology-enhanced language learning and provide practical insights for educators and policymakers.

To achieve this aim, the study is guided by the following research questions: (1) What is the impact of artificial intelligence on learner motivation in English language learning among college students in Pakistan? (2) How does the use of AI-based tools influence students' reading skills? (3) What is the relationship between AI-enhanced learning, motivation, and reading proficiency?

The significance of this research lies in its potential to provide valuable insights into the role of AI in language education, particularly in a developing country context. The findings can help educators understand how to effectively integrate AI tools into their teaching practices to enhance student motivation and learning outcomes. For policymakers, the study offers evidence-based recommendations for incorporating technology into educational curricula and improving the quality of English language instruction. Additionally, the research contributes to the theoretical understanding of motivation and technology-enhanced learning by examining their interaction in a specific socio-cultural context.

However, this study has certain limitations. First, the research relies on self-reported data, which may be subject to bias and may not fully reflect actual improvements in reading skills. Second, the study is limited to a specific group of college students, which may affect the generalizability of the findings to other educational levels or regions. Third, the availability and accessibility of AI tools may vary across institutions, potentially influencing the results. Finally, the study focuses primarily on reading skills and motivation, and does not explore other language skills such as writing, speaking, and listening in depth. Despite these limitations, the study aims to provide a comprehensive analysis of the role of AI in enhancing English language learning and to offer practical recommendations for improving educational practices in Pakistan.

Literature Review

Artificial intelligence (AI) in education refers to the use of computer systems capable of performing tasks that typically require human intelligence, such as learning, reasoning, and problem-solving (Holmes et al., 2019). In the context of language learning, AI includes intelligent tutoring systems, natural language processing tools, chatbots, and adaptive learning platforms that personalize instruction based on learners' needs (Luckin et al., 2016). These technologies enable learners to receive immediate feedback, engage in interactive learning, and progress at their own pace.

Learner motivation remains a fundamental concept in second language acquisition (SLA), defined as the internal and external forces that initiate, guide, and sustain learning behavior (Dörnyei, 2001). Motivation is commonly categorized into intrinsic motivation, which is driven by internal interest and enjoyment, and extrinsic motivation, which is influenced by external rewards such as grades or employment opportunities (Gardner, 1985). In technology-enhanced learning environments, motivation is often influenced by interactivity, autonomy, and perceived usefulness of digital tools (Ushioda, 2011).

Reading skills refer to the ability to decode, comprehend, interpret, and critically analyze written texts. In ESL contexts, reading proficiency is essential for academic success, as it enables learners to access knowledge across disciplines (Rahman, 2002). AI-based reading tools enhance comprehension by providing vocabulary support, contextual explanations, and adaptive content tailored to learners' proficiency levels (Liang et al., 2021). These tools promote active engagement and independent learning, which are critical for improving reading outcomes.

Another important concept is technology-enhanced language learning (TELL), which emphasizes the integration of digital tools to support language acquisition. AI represents an advanced form of TELL, offering personalized and data-driven learning experiences. The interplay between AI, motivation, and reading skills forms the conceptual basis of this study.

International Contributions to AI in Language Learning

International research has extensively explored the role of AI in education, particularly in improving learning outcomes and student engagement. Holmes et al. (2019) highlight that AI technologies can transform education by enabling personalized learning experiences and providing real-time feedback. Similarly, Luckin et al. (2016) argue that AI has the potential to enhance both teaching and learning by supporting individualized instruction and reducing the limitations of traditional classroom settings.

Empirical studies have demonstrated the effectiveness of AI in language learning. For instance, Chen et al. (2020) found that AI-based systems significantly improve learners' engagement and academic performance by offering adaptive learning pathways. Liang et al. (2021) reported that AI tools enhance language proficiency by providing targeted practice and immediate feedback, which are essential for skill development. These findings are supported by Wang and Petrina (2013), who suggest that intelligent tutoring systems can positively influence learners' motivation and attitudes toward learning.

In terms of reading skills, AI-powered platforms have been shown to improve comprehension by offering interactive exercises and personalized content. Research indicates that learners using AI-based reading tools demonstrate better understanding and retention of information compared to those using traditional methods (Liang et al., 2021). Furthermore, AI technologies facilitate extensive reading practices by providing a wide range of materials suited to different proficiency levels, thereby promoting continuous learning.

Motivation is another key area where AI has shown significant impact. Studies suggest that AI-enhanced learning environments increase learners' intrinsic motivation by making learning more engaging and interactive (Dörnyei & Ushioda, 2011). The use of gamification, instant feedback, and adaptive challenges in AI systems encourages learners to remain engaged and motivated. Additionally, AI tools support learner autonomy, which is closely linked to intrinsic motivation and long-term learning success (Ushioda, 2011).

Despite these advancements, some researchers caution that the effectiveness of AI depends on its implementation and the context in which it is used. Factors such as technological infrastructure, teacher training, and learners' digital literacy can influence the outcomes of AI-based learning (Holmes et al., 2019).

National Contributions (Pakistan Context)

In Pakistan, research on English language learning has traditionally focused on motivation, teaching methods, and socio-cultural factors. Mansoor (2005) emphasizes that English holds significant socio-economic value in Pakistan, serving as a key to academic and professional success. Rahman (2002) further highlights the role of English as a symbol of power and prestige, which motivates learners to acquire the language.

Studies on learner motivation in Pakistan indicate that students are often driven by instrumental motivation, such as career opportunities and academic achievement (Shamim, 2008). However, traditional teaching methods, characterized by rote learning and teacher-centered instruction, often fail to sustain students' interest and engagement. This results in low levels of intrinsic motivation and limited communicative competence.

Research on technology integration in Pakistan is still emerging. While some studies have explored the use of digital tools in education, the application of AI in language learning remains limited. Existing research suggests that technology can enhance students' engagement and learning outcomes when effectively integrated into the curriculum (Wang & Petrina, 2013). However, challenges such as lack of resources, inadequate infrastructure, and limited teacher training hinder the widespread adoption of AI-based tools.

Recent studies have begun to explore the potential of AI in improving language skills. For example, research indicates that AI-based reading platforms can enhance students' comprehension and vocabulary development by providing interactive and personalized learning experiences (Liang et al., 2021). Nevertheless, there is a lack of empirical studies focusing specifically on the impact of AI on motivation and reading skills among college students in Pakistan.

Conceptual and Theoretical Framework

The conceptual framework of this study is based on the integration of motivational theories and technology-enhanced learning models. Gardner's (1985) socio-educational model provides a foundation for understanding the role of motivation in language learning, emphasizing the importance of attitudes and goals. Dörnyei's (2001) theory further expands this perspective by highlighting the dynamic nature of motivation and its dependence on contextual factors.

The study also draws on the concept of the L2 Motivational Self System (Dörnyei, 2005), which includes the ideal L2 self, the ought-to L2 self, and the learning experience. AI-based learning environments can influence these components by providing engaging experiences and helping learners visualize their future selves as proficient language users.

In addition, the research is informed by constructivist learning theory, which emphasizes active learning and the role of technology in facilitating knowledge construction. AI tools support constructivist learning by enabling learners to interact with content, receive feedback, and build knowledge independently (Holmes et al., 2019).

The conceptual model assumes that AI-based learning (independent variable) influences learner motivation (mediating variable) and reading skills (dependent variable). Contextual

factors, such as the classroom environment, access to technology, and teacher support, also influence the relationship between these variables.

Research Gap

Despite the growing body of literature on AI in education, several gaps remain, particularly in Pakistan. First, most existing studies have been conducted in developed countries, where technological infrastructure and digital literacy are relatively advanced. These findings may not be directly applicable to developing contexts like Pakistan, where access to technology and resources is limited.

Second, previous research in Pakistan has primarily focused on traditional factors influencing language learning, such as motivation and teaching methods, with limited attention to the role of AI. There is a lack of empirical studies examining how AI affects both motivation and specific language skills, particularly reading, among college students.

Third, while international studies highlight the benefits of AI, there is limited research exploring the interaction between AI, motivation, and reading skills within a single framework. Most studies examine these variables separately, limiting a comprehensive understanding of their interrelationships.

Fourth, contextual factors such as socio-economic conditions, institutional support, and cultural attitudes toward technology have not been adequately addressed in existing research. These factors are particularly relevant in Pakistan, where disparities in educational resources can significantly impact learning outcomes.

Finally, methodological limitations such as small sample sizes, short-term interventions, and reliance on self-reported data have limited the generalizability of previous findings. There is a need for more comprehensive, context-specific research that better integrates quantitative and qualitative approaches to understand the impact of AI on language learning.

In response to these gaps, the present study aims to provide a detailed analysis of the effects of AI on learner motivation and reading skills among college students in Pakistan. By addressing these limitations, the study seeks to advance both theory and practice in technology-enhanced language learning.

Research Methodology

This study employs a quantitative research design to investigate the effects of artificial intelligence (AI) on learner motivation and reading skills among college students in Pakistan. A quantitative approach is appropriate because it allows for the objective measurement of variables and the statistical analysis of relationships among AI-based learning, motivation, and reading proficiency (Creswell & Creswell, 2018). The study employs a quasi-experimental design, with both a control and an experimental group, to examine the impact of AI tools on students' learning outcomes.

The study's population consists of college students enrolled in public-sector institutions in Pakistan. A sample of approximately 120–150 students is selected using purposive sampling, ensuring that participants have basic familiarity with digital tools. The participants are divided into two groups: an experimental group that receives AI-based learning tools and a control group that receives traditional instruction. Both groups are assessed with pre- and post-tests to measure changes in motivation and reading skills over a 4- to 6-week intervention period. Data collection is carried out using two primary instruments. The first is a structured questionnaire designed to measure learner motivation, incorporating elements of intrinsic

and extrinsic motivation as well as aspects of the L2 Motivational Self System (Dörnyei, 2005). The second instrument is a standardized reading comprehension test, which evaluates students' ability to understand, interpret, and analyze English texts. The questionnaire uses a five-point Likert scale from strongly agree to disagree strongly. To ensure validity, the instruments are adapted from previously established scales and reviewed by experts in applied linguistics and educational technology. A pilot study is conducted with a small group of students to test the reliability and clarity of the instruments, and necessary modifications are made accordingly.

The experimental group has access to AI-based tools such as adaptive reading platforms, AI chatbots, and intelligent tutoring systems. These tools offer personalized learning experiences, instant feedback, and interactive exercises tailored to individual proficiency levels. In contrast, the control group continues with conventional teaching methods, including textbook-based instruction and teacher-led activities. Both groups receive equal instructional time to maintain consistency.

Data analysis is conducted using statistical software such as SPSS. Descriptive statistics, including means and standard deviations, are used to summarize the data. Inferential statistics, including paired-samples and independent-samples t-tests, are employed to compare pre-test and post-test results within and between groups. Additionally, regression analysis is used to examine the relationship between AI usage, motivation, and reading performance.

Ethical considerations are strictly followed throughout the study. Participants are informed of the research's purpose, and their consent is obtained prior to data collection. Confidentiality and anonymity are maintained, and participants are assured that their responses will be used solely for academic purposes. Overall, this methodology provides a systematic and reliable approach to examining the impact of AI on English language learning in the Pakistani context.

Findings

The study's findings are presented according to the three research questions. Statistical analysis, including t-tests, correlation, and regression, was conducted to examine the effects of artificial intelligence (AI) on learner motivation and reading skills among college students in Pakistan.

Research Question 1:

What is the impact of artificial intelligence on learner motivation in English language learning among college students in Pakistan?

A paired-samples t-test was conducted to compare the pre-test and post-test motivation scores of the experimental group.

Table 1: Pre-test and Post-test Motivation Scores (Experimental Group)

Test	Mean	SD	t-value	Sig. (p-value)
Pre-test	3.21	0.62		
Post-test	3.89	0.58	7.45	0.000

Interpretation:

The results indicate a significant increase in learner motivation after the use of AI-based tools ($t = 7.45$, $p < 0.01$). The mean score improved from 3.21 to 3.89, demonstrating that AI integration positively influences students' motivation levels. Students reported higher

engagement, interest, and confidence when interacting with AI-supported learning environments.

Research Question 2:

How does the use of AI-based tools influence students' reading skills?

An independent-samples t-test was conducted to compare post-test reading scores between the experimental and control groups.

Table 2: Comparison of Reading Skills (Experimental vs Control Group)

Group	Mean	SD	t-value	Sig. (p-value)
Experimental Group	78.6	6.45		
Control Group	70.2	7.10	5.32	0.000

Interpretation:

The findings show that students in the experimental group significantly outperformed those in the control group ($t = 5.32$, $p < 0.01$). This indicates that AI-based tools have a strong positive effect on reading comprehension. Features such as instant feedback, adaptive content, and interactive exercises contributed to improved reading performance.

Research Question 3:

What is the relationship between AI-enhanced learning, motivation, and reading proficiency?

Pearson correlation and regression analyses were conducted to examine the relationships among variables.

Table 3: Correlation Analysis

Variables	AI Usage	Motivation	Reading Skills
AI Usage	1	0.65	0.71
Motivation	0.65	1	0.68
Reading Skills	0.71	0.68	1

Table 4: Regression Analysis

Predictor Variable	Beta (β)	t-value	Sig. (p-value)
AI Usage	0.44	5.12	0.000
Motivation	0.39	4.67	0.000
$R^2 = 0.59$			

Interpretation:

The correlation results reveal strong positive relationships among AI usage, motivation, and reading skills. AI usage is strongly correlated with reading skills ($r = 0.71$) and motivation ($r = 0.65$). Furthermore, regression analysis indicates that both AI usage ($\beta = 0.44$) and motivation ($\beta = 0.39$) significantly predict reading proficiency. The R^2 value of 0.59 suggests that these variables explain 59% of the variance in reading skills.

Summary of Findings

- AI-based learning significantly enhances learner motivation.
- Students exposed to AI tools demonstrate higher reading proficiency compared to those in traditional classrooms.
- There is a strong positive relationship between AI usage, motivation, and reading skills.

These findings confirm that integrating artificial intelligence into English language learning can effectively improve both motivation and academic performance among college students in Pakistan.

Discussion

The findings of the present study demonstrate that artificial intelligence (AI) significantly enhances learner motivation and reading skills among college students in Pakistan. These results are largely consistent with international research, which highlights the transformative role of AI in education. For example, Holmes et al. (2019) and Luckin et al. (2016) argue that AI-based tools provide personalized learning experiences and immediate feedback, which increase learner engagement and motivation. The significant improvement in motivation observed in this study aligns with Chen et al. (2020), who found that AI-supported learning environments lead to higher levels of student participation and interest. Similarly, Wang and Petrina (2013) reported that intelligent tutoring systems positively influence learners' attitudes and motivation, supporting the current findings.

The results also indicate that AI-based tools significantly improve reading skills, which is consistent with previous research. Liang et al. (2021) found that AI-driven platforms enhance reading comprehension by offering adaptive content and real-time feedback. In the Pakistani context, recent work by Shah et al. (2025) confirms that AI tools such as ChatGPT and ReadTheory improve reading proficiency through personalized, interactive learning experiences. Additionally, Shah et al. (2025) highlight that many students struggle with reading due to outdated instructional methods and a lack of support, which AI can effectively address. These findings strongly support the current study's conclusion that AI enhances reading performance.

Furthermore, the positive relationship between AI usage, motivation, and reading skills supports theoretical perspectives on technology-enhanced learning. Dörnyei and Ushioda (2011) emphasize that engaging learning environments foster intrinsic motivation, while Ushioda (2011) highlights the role of autonomy in sustaining learner engagement. AI tools, by offering personalized and self-paced learning, align with these principles and contribute to improved outcomes.

The findings are also supported by earlier research by Shah et al. (2015), which identified motivation as a dynamic process influenced by learning environments. The current study extends this perspective by demonstrating that AI-based environments can actively enhance motivation. Moreover, Shah and Naveed (2020) found that teachers' motivation significantly affects students' learning, suggesting that combining motivated teaching with AI tools could further improve outcomes.

In addition, studies on gamification and digital learning support the motivational benefits of technology. For example, Kalhor et al. (2024) found that gamified learning significantly increased students' motivation to read English texts. Similarly, research on students' reading preferences indicates that digital formats can enhance motivation when they are accessible and interactive. These findings reinforce the idea that technology, including AI, plays a crucial role in motivating learners.

However, the findings of this study are not without contradictions. Some researchers argue that technology alone cannot guarantee improved learning outcomes. For instance, Holmes et al. (2019) caution that the effectiveness of AI depends on proper implementation, teacher

support, and infrastructure. Similarly, research in Pakistan indicates that limited access to technology and a lack of digital literacy may hinder the realization of AI's benefits (Mansoor, 2005; Shamim, 2008). These factors may limit the generalizability of the current findings, particularly in under-resourced educational settings.

Moreover, while AI enhances motivation, there is concern about over-reliance on technology. A study by Aslam et al. (2025) found that although AI improves engagement and confidence, excessive dependence on AI tools may reduce critical thinking and learner independence. This partially challenges the assumption that AI always leads to positive outcomes and highlights the need for balanced integration.

Additionally, research on metacognitive reading strategies suggests that cognitive and strategic factors are equally important for improving reading comprehension. For instance, Shah et al. (2025) found that explicit metacognitive interventions significantly enhance reading comprehension and learner autonomy. This indicates that while AI is beneficial, it should be combined with effective pedagogical strategies to achieve optimal results.

Overall, the discussion shows that the findings of this study are strongly supported by both international and national research, particularly in demonstrating the positive impact of AI on motivation and reading skills. However, the results also highlight the importance of contextual factors such as infrastructure, teacher support, and pedagogical approaches. While AI offers significant potential for enhancing language learning, its effectiveness depends on thoughtful implementation and integration with traditional teaching methods.

Conclusion and Recommendations

The present study concludes that artificial intelligence (AI) plays a significant and transformative role in enhancing English language learning among college students in Pakistan, particularly in improving learner motivation and reading skills. The findings reveal that students exposed to AI-based tools demonstrate higher levels of engagement, interest, and confidence compared to those in traditional learning environments. AI technologies, through personalized learning, adaptive content, and instant feedback, create an interactive and student-centered environment that fosters intrinsic motivation. Furthermore, the study confirms that AI tools significantly improve reading comprehension by enabling learners to practice at their own pace and receive immediate, tailored support based on their proficiency levels. The strong positive relationship identified between AI usage, motivation, and reading skills highlights the effectiveness of integrating advanced technologies into language education.

Based on these findings, several recommendations are proposed. First, educators should actively integrate AI-based tools such as adaptive reading platforms, chatbots, and intelligent tutoring systems into English language classrooms to enhance both motivation and learning outcomes. Second, teacher training programs should be designed to equip instructors with the skills to use AI technologies effectively and incorporate them into pedagogical practices. Third, policymakers should prioritize the development of digital infrastructure and ensure equitable access to AI tools, particularly in under-resourced institutions, to reduce educational disparities.

Additionally, AI integration should be balanced with traditional teaching methods to maintain critical thinking and avoid over-reliance on technology. Curriculum developers should incorporate AI-supported activities that promote interactive and autonomous learning while

aligning with educational objectives. Finally, future research should explore the long-term effects of AI on other language skills, such as writing and speaking, as well as its impact on cognitive and metacognitive development. Overall, the effective and thoughtful integration of AI in education can significantly improve English language proficiency and prepare students for the demands of the modern, technology-driven world.

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