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The Impact of Artificial Intelligence on English Language Learning Among Pre-Service Educators

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Abstract

This study investigated the impact of artificial intelligence (AI) on English language learning among pre-service educators at Northern Iloilo State University. Guided by Connectivism and Socio-Constructivist theories, the research examined how AI tools influence learners' motivation, engagement, and proficiency while identifying challenges encountered in their use. A descriptive quantitative design was employed, involving sixty pre-service English teachers who responded to a validated Likert-scale questionnaire. Data were analyzed using descriptive and inferential statistics, including Pearson's correlation at a 0.05 significance level. Findings revealed a high extent of AI tool utilization, particularly grammar checkers, translation tools, and chatbots, which were perceived as highly beneficial in enhancing language accuracy, confidence, and engagement. Results further indicated significant positive correlations between AI integration and learning outcomes, suggesting that AI contributes to both cognitive and affective improvement in language learning. However, participants also reported moderate challenges related to internet access, training limitations, and ethical concerns. The study concludes that AI integration enhances English language learning when supported by digital literacy, pedagogical readiness, and institutional support. It recommends embedding AI literacy in teacher education curricula to ensure the ethical, equitable, and pedagogically sound use of intelligent technologies in future classrooms.

Keywords: Artificial Intelligence, English Language Learning, Pre-Service Educators, Digital Literacy, Pedagogical Readiness

1. Introduction

The integration of artificial intelligence (AI) into education has transformed traditional teaching and learning processes, providing opportunities for innovation, personalization, and efficiency. In language education, AI has become a significant pedagogical tool that enhances communication, fosters learner autonomy, and supports adaptive learning experiences (Zawacki-Richter et al., 2019). The use of AI-driven platforms such as intelligent tutoring systems, automated feedback tools, and chatbots has allowed language learners to engage in more interactive and context-based learning environments (Li, Link, & Hegelheimer, 2021). For pre-service English teachers, AI not only serves as a learning resource but also as a pedagogical partner that shapes their future teaching methods and attitudes toward digital instruction. The rapid advancement of AI technologies has therefore made it essential for teacher education programs to prepare future educators with digital literacy skills and critical understanding of how AI can be effectively integrated into language teaching.

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In the Philippine context, AI adoption in education remains an emerging field influenced by technological infrastructure, institutional readiness, and teacher competence. According to Dizon and Gayed (2021), AI tools in English language learning have been increasingly utilized for vocabulary acquisition, pronunciation training, and writing improvement, yet the effectiveness of these tools depends largely on the user's ability to adapt and apply them meaningfully. Pre-service teachers, often considered digital natives, are expected to be tech-savvy and capable of navigating AI-based educational platforms. However, not all possess the same level of technological proficiency, confidence, or pedagogical awareness necessary for effective integration (Bai & Wang, 2023). This variation may affect their motivation, self-efficacy, and perception of AI as a facilitator of English language learning.

Research on AI in education emphasizes that technology alone does not guarantee improved learning outcomes; rather, it is the teacher's role that determines the pedagogical value of AI applications (Holmes et al., 2022). For pre-service English educators, developing the capacity to integrate AI tools requires both technical competence and critical reflection on ethical, linguistic, and cultural implications (Luckin, 2021). Moreover, the balance between human interaction and machine-generated feedback remains a concern in maintaining meaningful communication in English language classrooms (Wang & Vasudevan, 2022). Despite the global interest in AI-enhanced education, there remains limited empirical research in the Philippines focusing on the attitudes, experiences, and readiness of pre-service teachers to use AI for English language learning.

Thus, this study explores the impact of artificial intelligence on English language learning among pre-service educators. It aims to identify how AI tools influence learners' engagement, motivation, and language development, as well as the challenges encountered in their integration. The study's findings are expected to contribute to a deeper understanding of AI's role in language education, providing insights for curriculum designers and teacher education institutions seeking to align instructional practices with the demands of digital and AI-driven learning environments.

Aim and Objectives

Aim:

This study aims to explore the impact of artificial intelligence (AI) on English language learning among pre-service educators, focusing on how AI tools influence motivation, engagement, and language skill development.

Specific Objectives:

a. To determine the extent to which pre-service educators use artificial intelligence tools in learning English.
b. To identify the perceived benefits of AI integration in English language learning among pre-service educators.
c. To examine the challenges encountered by pre-service educators when using AI for language learning.
d. To assess the relationship between AI use and learners' motivation and performance in English.
e. To propose strategies for enhancing AI-based English language learning in teacher education programs.

Significance of the Study

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This study is significant as it contributes to the growing discourse on the role of artificial intelligence (AI) in reshaping English language education, particularly within teacher preparation programs. The integration of AI in learning environments provides pre-service educators with opportunities to enhance their language proficiency, autonomy, and digital literacy, which are essential competencies in the 21st century (Zawacki-Richter et al., 2019). For teacher education institutions, the findings offer insights into how AI tools can be effectively embedded in instructional practices to foster engagement and personalized learning. Language educators can benefit from understanding how AI-driven applications—such as intelligent feedback systems, chatbots, and adaptive learning platforms—improve learners' motivation and performance (Li, Link, & Hegelheimer, 2021). Meanwhile, policy makers may utilize the results to formulate institutional frameworks that support sustainable and ethical AI integration in higher education (Luckin, 2021). This study also holds relevance for pre-service teachers, who must develop both technological competence and pedagogical flexibility to adapt to evolving classroom contexts. By examining their experiences, perceptions, and challenges, this research provides valuable evidence for designing training programs that balance technological advancement with human-centered pedagogy, ensuring that future English educators are both digitally capable and pedagogically responsive in an AI-driven educational landscape.

Theoretical Framework

This study is anchored on Connectivism Theory (Siemens, 2005) and Socio-Constructivism (Vygotsky, 1978), which together explain how artificial intelligence (AI) supports language learning in digital and interactive contexts. Connectivism posits that learning occurs through networks of information, technologies, and human interactions, emphasizing the ability to access and apply knowledge across diverse digital sources. Within this framework, AI tools—such as intelligent tutoring systems, automated feedback platforms, and language chatbots—serve as nodes of learning that provide real-time feedback and personalized support, enabling pre-service educators to build language competence beyond traditional classroom boundaries (Kerr, 2021). Meanwhile, Vygotsky's socio-constructivist perspective highlights the role of social interaction and scaffolding in cognitive development. AI technologies simulate these functions by offering guided feedback, modeling linguistic structures, and adapting instruction according to learners' proficiency levels (Holmes et al., 2022). The integration of these theories underscores that learning through AI is both socially mediated and technologically connected, fostering active engagement, collaboration, and autonomous learning. Thus, this theoretical grounding provides a lens through which the study examines how AI applications influence motivation, interaction, and communicative competence among pre-service English educators.

Conceptual Framework

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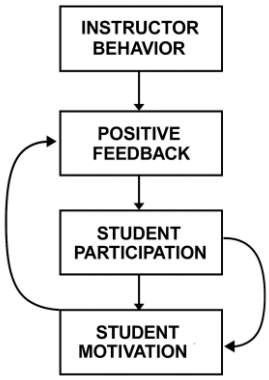

Figure 1. Diagram of Conceptual Framework

Figure 1 presents the conceptual framework illustrating the relationship between artificial intelligence (AI) integration and English language learning outcomes among pre-service educators. The Independent Variable, Integration of Artificial Intelligence in English Language Learning, represents the use of AI tools such as intelligent tutoring systems, automated feedback programs, and adaptive platforms that support skill development and communication. The Dependent Variable, Language Learning Outcomes, encompasses the key areas of motivation, engagement, and proficiency, which reflect how learners respond cognitively and affectively to AI-based instruction. The Moderating Variable, Digital Literacy and Pedagogical Readiness of Pre-Service Educators, influences the degree to which AI integration effectively enhances learning outcomes. High levels of digital literacy and pedagogical readiness allow pre-service teachers to navigate AI tools confidently and apply them meaningfully in language learning contexts. The arrows indicate that successful AI integration leads to improved language learning outcomes, while the moderating variable shapes the strength and direction of this relationship. This framework aligns with Connectivism Theory (Siemens, 2005) and Socio-Constructivism (Vygotsky, 1978), emphasizing that learning in AI-supported environments is both technologically mediated and socially constructed.

2. Review of Related Literature

Artificial intelligence (AI) has expanded rapidly across higher education, reframing how language learning is designed, delivered, and assessed. A large-scale systematic review of AI in higher education found that adaptive tutoring, automated assessment, and conversational agents are the most common applications, with reported benefits in personalization and feedback cycles—but also with persistent gaps in teacher preparation and evaluation frameworks (Zawacki-Richter, Marín, Bond, & Gouverneur, 2019). Within second-language contexts, AI systems are increasingly embedded in learning management platforms and mobile tools, enabling data-driven recommendations and individualized pacing that traditional instruction struggles to provide (Holmes, Bialik, & Fadel, 2022).

Empirical research in applied linguistics shows that AI-enabled feedback can improve accuracy and revision quality, particularly in writing. Studies of intelligent tutoring and automated feedback report gains in error detection, targeted form-focused feedback, and iterative drafting, with positive effects on writing complexity and accuracy when AI support is combined with teacher mediation (Li, Link, & Hegelheimer, 2021). Beyond writing, AI-supported speech technologies—ASR-based pronunciation tutors and dialogue chatbots—offer low-stakes practice that increases time-on-task and immediate corrective feedback, which are linked to improved fluency and pronunciation monitoring (Bai & Wang, 2023). These benefits align with connectivist and socio-constructivist views in which learners engage with multiple "nodes" of support and receive scaffolded guidance from both humans and intelligent systems.

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For teacher education, however, technology efficacy depends on instructors' digital literacy and pedagogical readiness. Reviews emphasize that the pedagogical value of AI is realized when teachers can interpret learning analytics, calibrate feedback, and orchestrate human–AI collaboration rather than outsource instruction to tools (Luckin, 2021; Holmes et al., 2022). In English language education programs, pre-service teachers report using AI for vocabulary, pronunciation, and writing support, but uptake varies with beliefs about accuracy, academic integrity, and the role of teacher feedback (Bai & Wang, 2023; Dizon & Gayed, 2021). Effective integration therefore requires explicit preparation in prompt design, critical evaluation of AI outputs, and alignment of AI activities with course outcomes and assessment rubrics.

Concerns persist regarding ethics, equity, and communicative authenticity. Scholars warn that opaque algorithms can reproduce bias and that over-reliance on AI may attenuate opportunities for interpersonal negotiation of meaning, a core mechanism in language development (Wang & Vasudevan, 2022). Institutions must address data privacy, transparency in automated scoring, and access disparities so that AI augments rather than replaces teacher feedback and interaction (Luckin, 2021; Zawacki-Richter et al., 2019). Taken together, the literature suggests that AI can enhance motivation, engagement, and proficiency when embedded within pedagogy that centers human judgment, scaffolding, and ethical guardrails—conditions especially salient in preparing pre-service English educators to integrate AI responsibly in their future classrooms.

3. Methodology

Research Design

This study employed a descriptive quantitative research design to explore the impact of artificial intelligence (AI) on English language learning among pre-service educators. The design was appropriate because it allowed for the systematic collection and analysis of data describing participants' experiences, perceptions, and attitudes toward AI-assisted learning without manipulation of variables. According to Creswell and Creswell (2018), descriptive research is used to identify and interpret current trends and relationships as they naturally occur. Through this design, the study sought to determine how AI integration influences engagement, motivation, and language proficiency among future English teachers.

Participants and Sampling Technique

The respondents of the study were sixty (60) pre-service English educators enrolled at Northern Iloilo State University – Ajuy Campus during the Academic Year 2023–2024. They were selected through purposive sampling, ensuring that all participants had prior exposure to AI tools or digital learning platforms for language learning. The sample size was considered sufficient for descriptive statistical analysis and reflected the overall population of English major students in the college. Participation was voluntary, and all respondents provided informed consent before answering the research instrument.

Research Instrument

Data were gathered using a structured questionnaire developed by the researchers and validated by three experts in language education and educational technology. The instrument consisted of three parts: (1) demographic profile, (2) extent of AI use in English language learning, and (3) perceived benefits and challenges of AI integration. Responses were measured on a five-point Likert scale, ranging from *1*

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(Strongly Disagree) to *5 (Strongly Agree)*. The tool was pilot-tested with ten respondents from a similar population, and the computed Cronbach's alpha coefficient of 0.91 indicated excellent internal consistency (Taber, 2018). The instrument aligned with previous frameworks used in studies examining AI integration and learner attitudes (Bai & Wang, 2023; Dizon & Gayed, 2021).

Data Gathering Procedure

Prior to data collection, the researchers obtained approval from the Department of Teacher Education and ensured compliance with institutional ethical standards. Questionnaires were distributed in both printed and online formats to accommodate participants' accessibility preferences. Respondents were given one week to complete the survey, after which responses were retrieved, screened for completeness, and encoded for analysis. All data were treated confidentially, and participants' identities were anonymized through code assignment.

Data Analysis

The collected data were analyzed using descriptive and inferential statistics. Frequency counts, percentages, means, and standard deviations were computed to describe the extent of AI use, perceived benefits, and challenges in English language learning. To test the relationship between AI integration and learners' motivation and performance, Pearson's correlation coefficient was used. A significance level of 0.05 was set to determine the rejection or acceptance of the null hypotheses. Statistical analysis was conducted using SPSS version 26, ensuring accuracy and reliability in data interpretation (Pallant, 2020).

Ethical Considerations

Ethical principles of voluntary participation, confidentiality, and informed consent were strictly observed throughout the research process. Participants were briefed on the study's objectives and assured that their responses would be used solely for academic purposes. No identifying information was collected, and all data were securely stored to prevent unauthorized access. The study adhered to institutional research ethics guidelines and followed recommendations on the responsible use of human participants in educational research (Resnik, 2020).

4. Results and Discussion

Table 1
Extent of Use of Artificial Intelligence Tools in English Language Learning

AI Tools/Applications	Mean	Verbal Interpretation
Grammar checkers (e.g., Grammarly, ProWritingAid)	4.42	Very High Extent
Translation tools (e.g., Google Translate, DeepL)	4.21	High Extent
AI-powered chatbots (e.g., ChatGPT, Elsa Speak)	4.10	High Extent
Automated pronunciation trainers	3.85	High Extent
Writing and feedback platforms	3.78	High Extent
Overall Mean	**4.07**	**High Extent**

As shown in Table 1, pre-service English educators reported a high extent of use of AI tools in English language learning (M = 4.07). Grammar checkers (M = 4.42) were the most frequently used, followed by

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translation tools (M = 4.21) and AI chatbots (M = 4.10). This indicates that most pre-service teachers actively use AI technologies to support writing accuracy, vocabulary acquisition, and oral proficiency. The findings align with Dizon and Gayed (2021), who emphasized that grammar and translation applications remain the most accessible and widely used AI tools for non-native English learners. Likewise, Li, Link, and Hegelheimer (2021) found that AI-enhanced feedback fosters learner autonomy by providing instant correction and personalized guidance. These results suggest that AI tools have become an integral part of English language learning, promoting self-directed and adaptive learning experiences among future educators.

Table 2
Perceived Benefits of AI Integration in English Language Learning

Perceived Benefit	Mean	Verbal Interpretation
Enhances vocabulary and grammar accuracy	4.38	Very High Benefit
Improves motivation and engagement	4.29	High Benefit
Provides immediate and personalized feedback	4.22	High Benefit
Increases confidence in communication	4.10	High Benefit
Promotes independent learning	4.04	High Benefit
Overall Mean	**4.21**	**High Benefit**

Table 2 shows that respondents perceived AI integration as highly beneficial to their English learning (M = 4.21). The strongest perceived benefit was the enhancement of vocabulary and grammatical accuracy (M = 4.38), which reflects the influence of AI feedback mechanisms in reinforcing correct usage and minimizing errors. This finding supports Bai and Wang (2023), who reported that AI tools significantly improve learners' linguistic performance through instant corrective input and adaptive practice. Furthermore, high scores for motivation (M = 4.29) and confidence (M = 4.10) suggest that AI fosters learner engagement and reduces apprehension in language tasks. As Holmes, Bialik, and Fadel (2022) noted, personalized AI environments enhance learner agency by allowing users to progress at their own pace. These findings underscore the pedagogical value of AI in strengthening both cognitive and affective domains of language learning.

Table 3
Challenges Encountered by Pre-Service Educators in Using AI for Language Learning

Challenge	Mean	Verbal Interpretation	Rank
Limited internet connectivity	4.05	High Challenge	1
Difficulty interpreting AI feedback	3.87	High Challenge	2
Overreliance on AI-generated outputs	3.72	Moderate Challenge	3
Lack of institutional support and training	3.68	Moderate Challenge	4
Concerns about data privacy and plagiarism	3.55	Moderate Challenge	5
Overall Mean	**3.77**	**Moderate Challenge**	—

As presented in Table 3, the major challenges faced by pre-service educators in AI-assisted learning include limited internet access (M = 4.05) and difficulty interpreting AI feedback (M = 3.87). These findings highlight that technical infrastructure and digital literacy remain essential factors in maximizing AI's potential. Similar results were reported by Zawacki-Richter et al. (2019), who identified unequal access to

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digital tools and insufficient training as barriers to effective AI adoption in higher education. Furthermore, respondents noted the risk of overreliance on AI outputs (M = 3.72), echoing concerns raised by Wang and Vasudevan (2022) about reduced critical thinking and authenticity in student work. The moderate challenge regarding data privacy (M = 3.55) also suggests a growing awareness among future teachers of the ethical implications of using AI tools. These results imply that institutions must balance innovation with digital ethics and capacity-building programs to ensure responsible AI usage.

Table 4
Correlation Between AI Integration and English Language Learning Outcomes

Variables Correlated	r-value	p-value	Interpretation
AI Integration and Motivation	0.68	0.000	Significant Relationship
AI Integration and Engagement	0.63	0.000	Significant Relationship
AI Integration and Proficiency	0.59	0.001	Significant Relationship

Table 4 reveals a strong positive correlation between AI integration and language learning outcomes, particularly in motivation ($r = 0.68$, $p < 0.05$) and engagement ($r = 0.63$, $p < 0.05$). This suggests that greater use of AI tools corresponds to higher learner enthusiasm and active participation in language learning. The correlation between AI use and proficiency ($r = 0.59$) also indicates that AI contributes to measurable improvements in linguistic skills. These findings are consistent with Holmes et al. (2022), who argued that AI applications improve learning efficiency and learner-centered engagement. Moreover, Luckin (2021) emphasized that AI facilitates adaptive assessment and personalized support, enhancing performance across skill areas. Therefore, the data confirm that AI serves as both a motivational and pedagogical enhancer, fostering effective and individualized English language learning experiences among pre-service educators.

Summary of Findings

The findings demonstrate that pre-service English educators actively use AI tools at a high level and perceive them as highly beneficial for improving motivation, vocabulary, and grammatical accuracy. However, challenges such as internet limitations, lack of training, and ethical concerns persist. Significant positive relationships between AI integration and learning outcomes indicate that AI enhances engagement and proficiency when combined with pedagogical readiness and digital literacy. These results affirm that AI has strong potential to transform English language learning but must be implemented within an ethical, well-supported, and learner-centered framework.

Implications of the Results

The results of this study have several important implications for teacher education, instructional design, and policy development. The significant relationship between AI integration and English language learning outcomes implies that technology-enhanced environments can substantially enrich the teaching and learning process when guided by sound pedagogy. For teacher education institutions, this suggests the need to integrate AI literacy into the curriculum, enabling future educators to critically evaluate and effectively use intelligent tools in language instruction (Bai & Wang, 2023). The findings also indicate that digital readiness and pedagogical competence are central to maximizing the potential of AI technologies. As Holmes, Bialik, and Fadel (2022) noted, successful AI integration depends not merely on tool

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availability but on teachers' capacity to adapt instruction and interpret algorithmic feedback for meaningful learning.

At the instructional level, AI tools can serve as facilitators of personalized learning, enhancing student motivation and autonomy. Teachers can leverage data-driven insights from AI applications to tailor instruction to learners' needs, a process that aligns with Luckin's (2021) advocacy for adaptive assessment and intelligent feedback. However, the findings also highlight ethical and infrastructural challenges that must be addressed, such as limited internet access and potential overreliance on machine-generated outputs. For policy makers, this points to the importance of ensuring equitable access to technological resources and establishing institutional guidelines for ethical AI use. Collectively, these implications reinforce that AI integration in language learning is not only a technological innovation but a pedagogical transformation that requires systemic support and continuous professional development.

Conclusion

This study explored the impact of artificial intelligence on English language learning among pre-service educators at Northern Iloilo State University. Results revealed that participants demonstrated a high level of AI use, particularly through grammar checkers, translation tools, and chatbots that enhance vocabulary, accuracy, and engagement. AI integration was found to have a positive and significant correlation with learners' motivation, engagement, and language proficiency. Despite these benefits, respondents reported challenges related to digital access, interpretation of AI feedback, and the need for institutional support. These findings confirm that AI serves as both a cognitive and affective enhancer, improving learners' confidence and fostering autonomous learning when properly implemented.

The study concludes that artificial intelligence has emerged as a transformative component of English language education, particularly for pre-service teachers preparing for technology-rich classrooms. However, its success depends on pedagogical readiness, ethical awareness, and digital competence. AI should not replace traditional instruction but rather complement it by providing adaptive learning experiences that reinforce communication skills and creative engagement. The evidence affirms that pre-service educators who develop both linguistic proficiency and technological fluency will be better equipped to guide future learners in an AI-augmented educational landscape.

Recommendations

Based on the findings and conclusions, several recommendations are proposed. For teacher education institutions, it is recommended that AI literacy and educational technology courses be formally embedded into the curriculum to strengthen future teachers' competence in using AI tools effectively and ethically. Training programs should focus on critical evaluation of AI feedback, data privacy, and strategies to balance machine assistance with human interaction in language teaching. For instructors and program designers, adopting blended models that combine AI-supported learning with collaborative classroom practices can help preserve the social and communicative dimensions of language education while leveraging automation for feedback and assessment (Wang & Vasudevan, 2022). Institutions should also invest in infrastructure improvements such as stable internet access, updated devices, and technical support systems to ensure equitable use of AI resources.

Moreover, policy makers and educational leaders should formulate guidelines for the responsible and transparent use of AI in higher education, including measures for academic integrity and data protection. Future researchers are encouraged to conduct longitudinal and mixed-method studies to explore how

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sustained AI use influences language performance and teaching identity development among pre-service educators. Expanding research to other contexts—such as rural teacher education programs or multilingual settings—may also yield deeper insights into contextual factors affecting AI adoption. Overall, the study recommends a holistic, human-centered approach to AI integration that prioritizes inclusivity, ethics, and pedagogical innovation in the preparation of future English teachers.

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