

Shaping Future Classrooms: English Pre-Service Teachers' Experiences with AI-Driven Teaching and Learning

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INFO ARTIKEL

ISSN: 2963-8933
Vol. 5, No. 2 Juni 2026
<http://jurnal.ardenjaya.com/index.php/ajpp>

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Saran Penulisan Referensi:

HY, M., Nadjib, N., Rahman, R. A., Hasanuddin, N., & Fajriani. (2026). Shaping Future Classrooms: English Pre-Service Teachers' Experiences with AI-Driven Teaching and Learning. *Arus Jurnal Psikologi dan Pendidikan (AJPP)*, 5(2), 1613-1722.

Abstrak

Penelitian ini menggunakan pendekatan kualitatif yang didukung oleh analisis kuantitatif deskriptif untuk mengkaji dampak teknologi berbasis deep learning dalam pembelajaran bahasa Inggris sebagai bahasa asing (EFL). Partisipan terdiri atas 25 calon guru Bahasa Inggris dari Polewali Mandar yang mengisi kuesioner 30 butir dengan skala Likert 5 poin, serta lima orang yang diwawancarai secara semi-terstruktur. Hasil penelitian menunjukkan bahwa para calon guru memiliki tingkat kepercayaan diri yang tinggi dalam menggunakan AI (M = 3,93), literasi AI yang baik (M = 3,70), serta sikap positif terhadap AI (M = 3,92). Dukungan institusi juga tergolong kuat (M = 3,75), meskipun kebutuhan pelatihan masih sangat tinggi (M = 4,25). Selain itu, mereka menunjukkan niat yang kuat untuk menggunakan AI (M = 3,84), terutama guru yang lebih berpengalaman yang menilai AI sangat bermanfaat (M = 4,32). AI dipandang membantu dalam perencanaan pembelajaran, meningkatkan kreativitas, efisiensi, serta kemandirian belajar siswa. Namun, terdapat kekhawatiran terkait ketergantungan berlebihan pada AI yang dapat menurunkan kemampuan berpikir kritis, memicu kemalasan akademik, dan mengurangi interaksi sosial. Secara keseluruhan, calon guru EFL menunjukkan kesiapan dan sikap positif terhadap integrasi AI, dengan catatan perlunya pelatihan, dukungan institusi, dan pedoman etis yang memadai.

Kata kunci : Kecerdasan Buatan (AI); Bahasa Inggris sebagai Bahasa Asing (EFL); Teknologi Deep Learning; Efikasi Diri Guru; Pelatihan Integrasi AI

Abstract

This study employed a qualitative design, supported by descriptive quantitative analysis, to explore the impact of deep learning-based technologies in English as a Foreign Language (EFL) classrooms. The participants were 25 pre-service English teachers from Polewali Mandar, who completed a 30-item questionnaire on a 5-point Likert scale and five of them took part in semi-structured interviews. Descriptive results showed that teachers reported high self-efficacy in using AI ($M = 3.93$), high AI literacy ($M = 3.70$), and positive attitudes toward AI ($M = 3.92$), alongside strong institutional support ($M = 3.75$) and very high training needs ($M = 4.25$). They also expressed a strong intention to use AI ($M = 3.84$), with experienced teachers showing very positive views of AI's usefulness ($M = 4.32$). The findings indicated that teachers perceived AI as helpful for lesson planning, creativity, efficiency, and promoting learner autonomy, but they were concerned about students' over-reliance on AI leading to reduced critical thinking, academic laziness, and weakened social interaction. Overall, the study concludes that pre-service EFL teachers are generally confident and positive about integrating AI into their pedagogy, provided that sufficient training, institutional support, and ethical guidelines are in place to ensure responsible and balanced use in both face-to-face and online learning environments.

Keyword: Artificial Intelligence (AI); English as a Foreign Language (EFL); Deep Learning Technology; Teacher Self- Efficacy; AI integrating Training

A. Introduction

Recent advancements in Artificial Intelligence (AI) technology have significantly transformed education, particularly in language teaching and learning (see e.g., García Laborda et al., 2024; Hockly, 2023; Traxler et al., 2023). AI provides language teachers with diverse resources that enhance teaching practices and student learning experiences (Lin, 2023; Nye et al., 2021). It also enables personalized learning and interactive practice, improving efficiency, engagement, and accessibility while fostering critical skills and digital literacy (Negrila, 2023).

Despite the potential benefits of AI in language teaching, challenges such as high implementation costs, integration time, and ethical concerns around data privacy and algorithmic bias remain (Brynjolfsson & McAfee, 2014). In addition, there remains a notable gap in understanding how preservice language teachers perceive these tools within their training programs. Previous studies have documented positive outcomes associated with AI usage in language learning; however, qualitative insights into preservice teachers' experiences and attitudes toward these technologies are limited (Vogt & Flindt, 2023).

With the exponential growth of Artificial Intelligence (AI), many sectors, including education, have been greatly impacted. The advancement of AI technologies and their application to educational practices have received considerable attention. AI could transform traditional pedagogical approaches in the context of ELT and offer innovative tools that can improve both teaching experience and learning experiences (Zhao & Lei, 2017). Applications of AI, such as intelligent tutoring systems, automated feedback tools, and adaptive learning platforms, have the potential to tailor learning to individual needs increase engagement, and offer timely support to learners (Luckin, 2018). But, the journey toward adopting AI in ELT deserves some caution due to several reasons involving the perceptions and experiences of both learners and educators.

The integration of AI in ELT is still relatively new in Indonesia, where empirical research regarding its contribution is still limited. Many of the unique challenges and opportunities of AI technology will apply to the educational landscape of the country. Considering the diversity of the students and educators in the ELT community, unequal access and usage of technology in education, and fast-moving pedagogy policies, the knowledge gained from this research to understand how stakeholders in ELT perceive and experience AI would provide much-needed insights that guide meaningful implementation (Dwii & John, 2024). This study seeks to fill some of this gap by inquiring in and through the perceptions and experiences of learners and educators in the tertiary education space of Indonesia with AI.

We have seen a growing body of literature on AI in education over the last ten years, as researchers study its potential to change the nature of what and how students learn (Zhao & Lei, 2017). AI sustainable value proposition AI technologies generate diverse advantages, including personalized learning, engagement level enhancement, and outcome performance improvement (Zhao & Lei, 2017). Intelligent tutoring systems, for instance, adapt to the individual needs of learners by offering personalized instruction and feedback that helps them progress through

Based on the VOSviewer visual mapping, there is a clear limitation in studies integrating the themes of “self-efficacy” and “digital technology” within learning experiences, despite their increasing relevance in the era of AI. Additionally, the topics of “generative AI tool” and assessment approaches based on “case studies” have not demonstrated strong links to the central topic of “experience”. This indicates a research gap that could be filled by further study, especially in the context of English teacher education”.

This study aims to fill these gaps by offering a qualitative exploration that investigates how language learners and language educators experience and perceive AI in the Indonesian tertiary education context. Situated within the COI framework, the research provides a new way of considering AI integration in ELT and the nuanced interplay among technology, pedagogy, and human dynamics. This contribution enhances the broader literature on AI in education by illustrating possibilities and challenges in a developing country context where access to technology and educational resources may be more constrained than in developed nations.

The research seeks, above all, to explore language learners’ attitudes and perceptions toward AI technologies in ELT classrooms, focusing on how they perceive the advantages and disadvantages of AI and the factors that motivate engagement with these technologies and influence academic performance. Second, it investigates educators’ sense-making of AI integration in ELT by examining factors that shape their attitudes, concerns, expectations, and overall willingness and capacity to use AI in their practice. Third, it analyzes practical experiences of learners and educators with AI applications in ELT environments, potential challenges and opportunities encountered, and the implications for the COI.

The study holds significant value for both local and international audiences by providing a multifaceted view of AI integration in English Language Teaching (ELT). Locally, it offers a detailed account of Indonesia’s current ELT landscape concerning AI usage, capturing the experiences and perspectives of students and teachers within a developing world context. This localized evidence supports the formulation of future educational policies and practices, contributing to developing approaches that integrate AI into ELT both in Indonesia and globally. On the international front, the study enriches existing literature related to AI in education by presenting a unique perspective through the Community of Inquiry (COI) framework. It encourages the engagement of diverse stakeholders in designing and implementing AI-driven educational solutions, emphasizing the importance of addressing the social dimensions of AI adoption. This highlights the necessity for a balanced approach that thoughtfully considers both the technical aspects and pedagogical implications of AI in education. The research also addresses two core questions: 1) What are the attitudes and perceptions of language learners toward the integration of AI technologies in English Language Teaching (ELT) classrooms?. 2) How do educators perceive the integration of AI in ELT, and what factors influence their attitudes, concerns, and readiness to adopt AI in their practice?

By connecting these local and global insights, the study provides a comprehensive understanding that supports the responsible and effective use of AI in enhancing ELT, ensuring that technological innovation harmonizes with ethical, social, and pedagogical considerations.

B. Methodology

This study investigated pre-service English teachers’ perceptions and experiences regarding the integration of artificial intelligence (AI) and deep learning technologies in English language teaching. The study focused on examining participants’ attitudes, self-efficacy, perceived usefulness, ethical concerns, and experiences in utilizing AI-based tools in educational settings. To obtain a comprehensive understanding of the phenomenon, both quantitative and qualitative data were collected and analyzed.

1. Research Design

This study employed a mixed-method research design with a convergent approach. Quantitative and qualitative data were collected during the same phase of the research process and were integrated during the interpretation stage. The quantitative component aimed to identify general patterns of participants’ perceptions toward AI integration, while the qualitative component provided deeper insights into their experiences, challenges, and perspectives. This design was selected to obtain a more comprehensive understanding of the role of AI and deep learning technologies in English language teaching.

2. Participants (Population and Sample)

The population of this study consisted of pre-service English teachers in Polewali Mandar. A purposive sampling technique was employed to select participants who had knowledge of

or experience with digital technologies and AI in language learning. Approximately 25 pre-service English teachers participated in the questionnaire survey. From the total participants, five individuals were selected for semi-structured interviews to provide more detailed information regarding their experiences and perceptions. Participation was voluntary, and all participants provided informed consent before data collection. To maintain confidentiality, pseudonyms were used instead of participants' real names.

3. Technique of Data Collection

The data were collected through an online questionnaire and semi-structured interviews. The questionnaire was distributed electronically using Google Forms, enabling participants to complete the survey conveniently from different locations. The questionnaire link was shared through personalized WhatsApp messages to facilitate communication and encourage participation. Following the questionnaire administration, semi-structured interviews were conducted with selected participants to gain deeper insights into their experiences with AI and deep learning technologies in English language teaching.

4. Instruments

Two instruments were utilized in this study: a questionnaire and a semi-structured interview guide. The questionnaire consisted of 30 items measured on a five-point Likert scale ranging from strongly disagree to strongly agree. The instrument assessed several dimensions, including teacher self-efficacy, attitudes toward digital technology, perceived usefulness, perceived efficiency, and ethical concerns regarding AI use. The questionnaire demonstrated high reliability with a Cronbach's alpha coefficient of 0.95. The interview guide was developed based on the objectives of the study and validated by experts to ensure content validity and clarity. The interviews explored participants' experiences, perceptions, and challenges related to AI integration in English language teaching.

5. Technique of Data Analysis

Quantitative data obtained from the questionnaires were analyzed using descriptive statistics. Mean scores were calculated to determine the level of participants' responses and were categorized into five levels: very low, low, moderate, high, and very high. Meanwhile, qualitative data from the semi-structured interviews were analyzed using thematic analysis. Interview transcripts were coded and categorized into themes representing participants' experiences and perceptions of AI integration in English language teaching. To enhance the validity and trustworthiness of the findings, quantitative and qualitative results were compared and integrated during the interpretation stage. This triangulation process provided a deeper understanding of the phenomenon and strengthened the credibility of the research findings.

C. Results and Discussion

Results

Twenty-five English as a Foreign Language (EFL) teachers participated in this study. Among them, 11 teachers had attended formal training on Artificial Intelligence (AI), while 14 had never participated in any formal AI training. A five-point Likert scale ranging from 1 (very low) to 5 (very high) was used to measure all questionnaire items. The data were analyzed descriptively using mean (M) and standard deviation (SD). To facilitate interpretation, the mean scores were categorized as follows: 1.00–1.80 = very low, 1.81–2.60 = low, 2.61–3.40 = moderate, 3.41–4.20 = high, and 4.21–5.00 = very high.

Table 1. Means and standard deviations for each construct (N = 25)

Construct	Number of Items	M	SD	Category
Self-efficacy	4	3.93	0.99	High
AI literacy	4	3.70	1.01	High
Attitudes towards AI	3	3.92	1.04	High
Institutional support	3	3.75	0.90	High
Training needs	4	4.25	1.08	Very high
Intention to use AI	4	3.84	0.85	High
Perspective of experienced teachers	3	4.32	0.74	Very high
Additional factors	5	3.65	0.95	High

Overall, all constructs obtained mean scores within the high to very high categories. Teachers' self-efficacy regarding AI use was high ($M = 3.93$, $SD = 0.99$), indicating that participants generally felt confident in their ability to utilize AI tools in teaching and learning activities. AI literacy also reached a high level ($M = 3.70$, $SD = 1.01$), suggesting that teachers possessed adequate knowledge and understanding of AI technologies, although there was still room for improvement. Positive attitudes toward AI were also evident, as reflected by a high mean score ($M = 3.92$, $SD = 1.04$), indicating that teachers generally viewed AI as beneficial for educational purposes.

Institutional support was perceived positively by participants ($M = 3.75$, $SD = 0.90$). Most teachers believed that educational institutions had begun providing opportunities and support for learning and implementing AI in teaching practices. Meanwhile, training needs emerged as one of the strongest constructs ($M = 4.25$, $SD = 1.08$), reaching the very high category. This finding suggests that teachers recognized the importance of additional training and professional development to effectively integrate AI into their classrooms.

The intention to use AI also scored highly ($M = 3.84$, $SD = 0.85$), indicating a strong willingness among teachers to adopt AI technologies in their future professional activities. The highest score was found in the construct of experienced teachers' perspectives ($M = 4.32$, $SD = 0.74$), suggesting that teachers with more teaching experience generally viewed AI as highly useful and promising. In addition, the construct of additional factors obtained a high score ($M = 3.65$, $SD = 0.95$), indicating that contextual factors such as challenges, concerns, and supporting conditions were perceived as important influences on AI adoption.

To enrich the quantitative findings, semi-structured interviews were conducted with five English teachers. The interviews explored teachers' perceptions of students' attitudes toward AI as well as teachers' own experiences using AI in English language teaching.

The interview data revealed that students generally showed positive attitudes toward AI-based learning activities. According to the participants, students were particularly interested in interactive learning experiences that involved AI-generated games, images, videos, and personalized learning activities. Teachers reported that students tended to be more engaged and motivated when AI tools were incorporated into classroom instruction. Participants also observed that AI enabled students to access learning resources more flexibly, allowing them to learn independently according to their interests, learning pace, and individual needs.

However, the interviews also revealed several concerns regarding students' use of AI. All five teachers expressed worries about students becoming overly dependent on AI technologies. Participants reported that students frequently relied on AI to complete assignments, generate ideas, search for vocabulary, and solve problems that they should be able to address independently. Teachers perceived this tendency as potentially reducing students' critical thinking skills, creativity, and learning autonomy. Some participants even reported modifying their assessment practices to minimize opportunities for excessive AI use.

Another issue raised during the interviews concerned the impact of AI on students' social interaction. Several teachers observed that students increasingly preferred interacting with AI tools rather than communicating with classmates or teachers. Participants suggested that excessive reliance on AI could reduce face-to-face communication, collaborative learning, and classroom discussion. In addition, some teachers reported that students occasionally trusted AI-generated information more than teachers' explanations, leading to concerns about teacher credibility and authority in the classroom.

Regarding teachers' perceptions of AI, all participants generally viewed AI as a useful educational tool. Teachers highlighted AI's contribution to lesson planning, instructional material development, assessment preparation, and administrative tasks. Participants noted that AI significantly reduced workload and improved efficiency. Several teachers also described AI as a valuable source of ideas and inspiration for creating engaging learning activities and instructional materials.

Nevertheless, participants emphasized that AI should not replace the role of teachers. They consistently argued that human judgment, pedagogical expertise, ethical considerations, and interpersonal interaction remained essential components of effective teaching. Teachers also identified several factors influencing AI adoption, including digital literacy, access to technological resources, institutional support, professional training opportunities, workload demands, and students' educational needs.

Discussion

The findings indicate that EFL teachers generally have positive perceptions toward AI integration in English language teaching. The high levels of self-efficacy, AI literacy, positive attitudes toward AI, institutional support, and intention to use AI suggest that teachers recognize the potential of AI to improve teaching and learning processes. These findings are consistent with previous studies showing that educators increasingly perceive AI as a valuable tool for enhancing instructional effectiveness, creativity, and student engagement (Arvin et al., 2023; Wulandari & Purnamaningwulan, 2024).

The interview findings further reveal that students demonstrate positive attitudes toward AI-based learning activities. Teachers reported that students are particularly interested in interactive learning experiences involving AI-generated games, videos, images, and personalized learning opportunities. These findings support previous studies showing that AI technologies, including gamified platforms, adaptive learning systems, and intelligent chatbots, can enhance student engagement, motivation, and learning outcomes (Zainuddin, 2024). Similarly, AI-supported learning environments provide flexible learning opportunities that allow students to access educational resources anytime and anywhere, thereby promoting learner autonomy and self-directed learning (Urbaite, 2025). The ability of AI systems to personalize learning experiences according to students' needs and preferences has also been found to contribute to greater academic achievement and learner independence (Abrar et al., 2025; Chen, 2025).

Despite these benefits, teachers expressed significant concerns regarding students' excessive dependence on AI. All interview participants reported that many students tend to use AI as a shortcut to complete assignments rather than as a tool to support learning. Teachers believed that such behavior could reduce critical thinking, creativity, and independent problem-solving skills. These concerns are supported by previous studies that identify the risks of AI dependency in educational contexts. Research has shown that excessive reliance on AI may lead to academic laziness, reduced originality, and weaker reasoning abilities (Zhang & Zhao, 2024). Similarly, Çela, Fonkam, and Potluri (2024) found that overdependence on AI can discourage students from engaging in critical thinking and independent problem-solving processes. Chavez et al. (2024) further argue that excessive AI use may weaken students' self-discipline and authentic learning experiences, while Fan et al. (2024) describe this phenomenon as "metacognitive laziness," where learners increasingly rely on AI-generated answers rather than reflecting on their own understanding. These findings support teachers' concerns that AI may negatively influence students' intellectual development if used without appropriate guidance.

Another important issue identified in this study is the influence of AI on students' social interaction and communication. Teachers observed that students increasingly prefer interacting with AI systems rather than engaging in discussions with peers and teachers. This finding aligns with previous studies suggesting that excessive use of AI technologies may weaken interpersonal communication and reduce classroom interaction (Dobrovská, Vaněček, & Yorulmaz, 2024). Van, Underwood, and Tai (2021) similarly found that students who rely heavily on digital technologies tend to participate less actively in collaborative learning activities. Furthermore, Han, Coghlan, Buchanan, and McKay (2024) argue that AI's speed and convenience may lead students to perceive human communication as less efficient, potentially reducing opportunities for meaningful classroom dialogue and social learning.

The interviews also revealed concerns regarding students' trust in AI-generated information. Several teachers reported that students sometimes regard AI as a more reliable source of information than teachers. This finding is supported by Chavez et al. (2024), who found that AI technologies may challenge traditional classroom authority when students perceive AI-generated responses as more objective than teacher explanations. Pitts and Motamedi (2025) further explain that students often develop a hybrid form of human-AI trust, in which AI is viewed as highly reliable despite its limitations. Consequently, educators must foster critical AI literacy and encourage students to evaluate AI-generated information critically rather than accepting it unquestioningly. Building trust and maintaining effective communication between teachers and students remain essential for ensuring meaningful learning experiences and academic integrity (Felten, Forsyth, & Sutherland, 2023).

The findings also demonstrate that teachers generally view AI as a beneficial educational assistant. Participants reported that AI helps them create instructional materials, design lesson plans, generate assessment tasks, and perform administrative duties more efficiently. These findings support previous studies indicating that AI can significantly reduce teachers' workload and improve instructional productivity (Eltahir & Babiker, 2024; Delello et al., 2025). Teachers

also described AI as a valuable source of inspiration for developing creative learning activities, which is consistent with studies highlighting AI's contribution to innovative instructional design and classroom engagement (Akyıldız, 2024; Liu et al., 2023).

In addition, teachers perceived AI as a tool that can support personalized and autonomous learning. Several participants noted that AI enables students to learn independently and access explanations tailored to their individual needs. Previous studies have similarly shown that AI-powered learning systems provide immediate feedback and personalized learning pathways, which can promote learner autonomy and self-regulated learning (Quinde et al., 2024; Niu et al., 2024). These findings suggest that AI can support both teachers and students when integrated appropriately into educational practices.

The results also highlight the importance of teachers' digital literacy, institutional support, and professional development opportunities. Participants emphasized that confidence in using AI is strongly influenced by technological knowledge, access to resources, and continuous training. This finding is consistent with previous research demonstrating that teachers who possess stronger digital competencies are more likely to adopt emerging technologies successfully (Meylani, 2024). Similarly, educators with extensive experience adapting to technological changes tend to view AI as a natural extension of educational innovation rather than a threat (Shuaili, 2025).

Furthermore, institutional support emerged as a key factor affecting AI adoption. Teachers emphasized the need for training programs, technological infrastructure, access to AI tools, and opportunities for professional collaboration. Previous studies have found that schools providing technological resources and professional support create more favorable conditions for meaningful AI integration (Castro-Díaz, 2025). Conversely, inadequate facilities, limited training opportunities, and contextual constraints may hinder teachers' readiness to use AI effectively, particularly in rural or specialized educational settings (Lotfi & Laajan, 2025).

Overall, the findings suggest that AI offers considerable benefits for English language teaching by improving efficiency, supporting creativity, enhancing learner engagement, and facilitating personalized learning. However, concerns related to dependency, critical thinking, social interaction, trust, and ethical use remain significant challenges. Consistent with Chan and Tsi (2023), the findings support the view that AI should function as a supportive educational tool rather than a replacement for teachers. Human judgment, ethical decision-making, and interpersonal relationships continue to play essential roles in effective teaching and learning. Therefore, successful AI integration requires a balanced approach that combines technological innovation, institutional support, professional development, and human-centered pedagogy.

D. Conclusion

Based on the results and discussion, the study concludes that English Foreign Language (EFL) teachers generally have high self-efficacy, AI literacy, and positive attitudes towards AI integration in teaching. They perceive strong institutional support and express a very high demand for further AI-related training to use AI effectively and responsibly. Experienced teachers especially view AI as a promising and useful tool for enhancing teaching practices. Teachers recognize AI's potential to improve lesson planning, creativity, efficiency, and learner autonomy, but also remain cautious about overreliance by students, which could lead to laziness, reduced critical thinking, and hindered social interaction.

The interviews reveal learners' enthusiasm for AI-based interactive and personalized learning, yet teachers voice concerns about students' dependence on AI for shortcuts and their decreasing social engagement and trust in teachers. The teachers stress that while AI is a valuable assistant in education, it must not replace human judgment, ethics, and interpersonal communication. The readiness to adopt AI depends on teachers' digital literacy, institutional support, workload, and contextual factors such as school environment.

Overall, AI is appreciated as a powerful educational tool that enhances teaching efficiency and student autonomy but requires careful implementation, adequate training, and balanced use to preserve critical thinking and social dynamics in learning environments.

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