Artificial Intelligence in Education: Readiness, Perceptions, and Implementation in an Early Childhood Teacher Education Program at Universitas Mataram

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ABSTRACT

Background: Early Childhood Teacher Education Program (*PGPAUD*) requires complex pedagogical translation of content into concrete learning experiences. In this context, Artificial Intelligence (AI) has the potential to support prospective teachers in developing personalized learning media, generating age-appropriate instructional content, and simulating interactive environments aligned with children's cognitive and socio-emotional development.

Objective: This study aims to examine the readiness, perceptions, and implementation of AI in learning activities within the *PGPAUD* program, Faculty of Teacher Training and Education, Universitas Mataram.

Method: This research employed a descriptive qualitative approach. The participants consisted of lecturers and students of the *PGPAUD* program. Data were collected through interviews, observations, and documentation using relevant research instruments. The data were analyzed using qualitative data analysis techniques, including data reduction, data display, and conclusion drawing.

Results: The findings indicate that lecturers and students demonstrate adequate digital readiness. However, the integration of AI in instructional practices remains limited. While AI improves learning efficiency and access to information, its use remains largely individual and exploratory due to limited training, lack of experience, and a absence of institutional policies.

Conclusion: Integrating AI into *PGPAUD* requires institutional support, targeted training, and clear policy frameworks. This study helps Indonesian higher education design adaptive, AI-integrated curricula, particularly for teacher education.

Keywords: Artificial Intelligence, technology readiness, user perception, AI implementation.

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INTRODUCTION

Fast digital innovation has greatly reshaped human life and educational systems significantly. Digital transformation has reshaped the ways individuals obtain information, communicate with others, and construct knowledge (Nazyrova et al., 2025). Within educational settings, technological progress has stimulated the emergence of various technology-supported learning innovations intended to boost the fitness, accessibility, and efficacy of acquisitionapproach (Zou et al., 2025). Among the technologies that have recently attracted substantial attention in education is AI (S. H. Raza & Farooq, 2025). AI refers to computer-based integrated mechanism to simulate certain domains of human cognitive functions, such as acquisition from data, identifying patterns, analyzing information, and generating recommendations or automated decisions (Niu et al., 2025). The development of AI provides new possibilities for creating learning systems that are more adaptive, personalized, and driven by data analysis (Juyal et al., 2025).

In educational practice, AI has gradually been utilized to support a variety of instructional activities (Chen, 2024). In the context of early childhood education, AI is not only used to provide adaptive learning materials but also to create interactive and developmentally appropriate learning experiences (Ljungcrantz, 2026). For example, AI-powered applications and intelligent tutoring systems can personalize content based on children's learning pace and responses, thereby supporting cognitive scaffolding and maintaining engagement among young learners, while interactive tools such as educational robots and multimodal learning platforms enhance participation, problem-solving skills, and social interaction through play-based environments (Tao & Binti Mohamad Nasri, 2025). In teacher training contexts, AI can assist prospective teachers in designing adaptive instructional materials, generating storytelling content, and simulating classroom scenarios that reflect authentic early childhood learning situations. Additionally, AI-based systems enable automated feedback and learning analytics, allowing teacher trainees to monitor student progress and adjust instructional strategies more effectively (Salas-Pilco et al., 2022). Through AI-supported systems, learning experiences can become more individualized because instructional content can be adjusted according to learners' abilities and needs (Fortuna et al., 2025).

Furthermore, AI technologies provide educators with granular insights into students' learning processes by analyzing patterns of behavior, learning difficulties, and academic progress, thereby enhancing learning effectiveness and supporting more informed instructional decision-making (Nguyen et al., 2023). However, within the context of Eastern Indonesia, particularly in Nusa Tenggara Barat (NTB) and Mataram, the implementation of AI in education faces distinct challenges, including disparities in access to digital infrastructure, inconsistent internet connectivity, unequal availability of technological facilities, and varying levels of digital literacy among educators and students (Haetami, 2025). These conditions indicate that, although AI offers significant global potential, its integration in regions such as NTB requires context-sensitive approaches that address issues of access, capacity building, and institutional support, thereby making the examination of AI utilization at Universitas Mataram important to generate locally grounded insights that bridge global technological advancements with the specific educational realities of the region (Bond et al., 2024).

The use of AI-based systems continues to expand in line with the flourishing adoption of digital systems in academic activities (Nazyrova et al., 2025). Students increasingly count on diverse AI applications to reinforce their learning processes, such as searching for academic information, processing data, generating ideas for academic writing, and exploring diverse digital learning resources (METLİ, 2023).

Similarly, lecturers can utilize AI tools to support teaching activities, including developing digital instructional materials, analyzing student learning activities, and providing feedback on academic assignments. These developments demonstrate that AI has considerable ability to facilitate the transformation of raised education learning by creating more flexible, interactive, and technology-enhanced learning environments (Schleicher, 2024).

AI adoption in education depends on infrastructure readiness and users' capability to apply it effectively (Mhlanga, 2024). Technological readiness involves several components, including individuals' competence in operating digital technologies and institutional support enables technology-based learning activities. Without sufficient readiness, the available technological tools may not be fully utilized in educational practices. Therefore, Assessing user readiness clarifies AI integration in universities settings (Timotheou et al., 2023).

In addition to readiness, users' perceptions toward technology also engage an important duties in influencing the diffusion and harnessing of technological tools in academic contexts (Nazyrova et al., 2025). Technology perception refers to individuals' beliefs regarding the usefulness of technology, its convenience of harness, and the coverage to which it can enhance learning effectiveness (Zou et al., 2025). AI denotes to computer-based systems adequate of simulating human neural processes. Positive perceptions tend to encourage individuals to actively integrate technology into their learning activities. In contrast, negative perceptions may hinder technology adoption even when the technology is accessible and available (Schleicher, 2024). Within teacher education contexts, the integration of digital technologies, including AI, is increasingly important because prospective teachers are expected to incorporate technology into future learning environments (Jaldemark et al., 2025). Rapid technological development requires educators not only to expert topic matter knowledge but also to exhibit the expertise necessary to integrate technological tools that support students' learning processes (Darwis et al., 2025). Consequently, teacher education institutions have a strategic role in preparing students to evolve digital awareness aptitude and the expertise to use technology creatively and responsibly in educational settings (Nazyrova et al., 2025).

The Early Childhood Teacher Education Program (*PGPAUD*), as one of the teacher preparation programs, has the responsibility to endow students with expertise that is pertinent to educational developments in the digital era (Gamal El Din, 2025). Integrating technology into *PGPAUD* courses can enrich learning experiences and expand students' access to digital learning resources. The utilization of AI technologies in lectures may also assist students in understanding learning concepts, enhancing creativity, and improving the overall effectiveness of learning activities (Kölemen & Yıldırım, 2025). However, the integration of AI in higher education, including *PGPAUD*, still encounters various challenges, particularly differences in students' readiness to use digital technologies and their perceptions of AI, which may influence the extent of its adoption in learning processes (Salhab, 2024). Previous studies have shown that the implementation of digital technologies in higher education often faces obstacles such as limited technological literacy, insufficient understanding of how technology can be effectively integrated into learning, and the suboptimal incorporation of digital tools into academic practices (Southworth et al., 2023).

Despite these insights, prior research has largely focused on general higher education contexts and has not specifically examined the unique characteristics of *PGPAUD* students, who must integrate pedagogical, developmental, and technological competencies simultaneously (Latorre-Medina & Abdelmaula-Mesaud, 2025). Moreover, existing studies tend to investigate digital readiness,

perceptions, or technology use separately, without exploring how these factors interact in shaping the effectiveness of AI integration in learning (Tunkevichus & Bagrationi, 2025). Another important gap lies in the limited empirical evidence from local contexts, particularly in Indonesian universities such as Universitas Mataram, where disparities in infrastructure, digital literacy, and institutional support may produce different dynamics compared to findings reported in global studies (Kasman et al., 2025). Therefore, this study is important to undertake as it seeks to provide a contextualized and integrated analysis of AI utilization in *PGPAUD* at Universitas Mataram, focusing on the interplay between students' readiness, perceptions, and the implementation of AI in learning activities.

Albeit the growing use of AI in educational contexts, limited studies have examined users' readiness, perceptions, and the tangible realization of AI in teacher education programs, particularly within early childhood teacher education settings. Understanding these aspects is essential because the impactful of AI integration in education relies on infrastructure, user readiness, and learning attitudes. Therefore, this study aims to analyze the readiness, perceptions, and implementation of Artificial Intelligence in learning activities within the Early Childhood Teacher Education Program, Faculty of Teacher Training and Education, Universitas Mataram. This study reveals AI use in higher education and supports strategies for teacher education integration.

METHODS

This qualitative descriptive study examined Artificial Intelligence use in university learning activities (Yeung et al., 2026). A qualitative method was chosen to deeply explore participants' experiences, views, and AI use in academics (Murphy et al., 2024). The research focused on three primary aspects: users' readiness, perceptions of AI technology, and the implementation of AI in learning processes (Herawati et al., 2024). The data collected consisted of verbal information, experiences, viewpoints, and observable behaviors obtained from the participants (Holland & Ciachir, 2025).

The study was conducted at the Early Childhood Teacher Education Program (*PGPAUD*), Faculty of Teacher Training and Education, Universitas Mataram, Indonesia. This research site was selected because the program represents a teacher education context where digital technologies have begun to be integrated into learning activities and where the adoption of AI-based learning practices has potential for further development. The participants included lecturers and students who were actively involved in teaching and learning within the program.

The participants were determined through purposive sampling, in which individuals were selected based on their relevance and involvement in learning activities related to the research focus. The selection was guided by specific inclusion criteria to ensure the credibility and depth of data. For lecturers, the criteria included: (1) actively teaching in the *PGPAUD* study program, (2) having a minimum of two years of teaching experience in higher education, and (3) integrating digital technologies or AI-based tools in their instructional practices. For students, the criteria included: (1) being actively enrolled in the *PGPAUD* program, (2) being in at least the third semester or above to ensure sufficient exposure to university learning processes, and (3) having experience in using digital technologies or AI-based applications in academic activities such as assignments, learning platforms, or course-related task (F. A. Raza et al., 2025). The number of participants ranged from 10 to 15 individuals, consisting of both lecturers and students. Informants were finalized when data saturation was reached, indicated by no emergence of new information during data collection.

Data for this study were obtained through several complementary techniques, including semi-structured interviews with participants, direct observations of learning activities, and the examination of relevant documents related to academic practices (Hasib & Islam, 2026). Semi-structured interviews gathered detailed views on participants' AI learning perceptions (Yeung et al., 2026). This interview style used guiding questions while letting participants freely expand their perceptions (Karimova et al., 2025). Observations were carried out to examine learning activities that involved digital technologies and AI-based applications within academic settings (Segaran & Moltudal, 2025). Through these observations, The researcher explored AI integration in learning and interactions (Ofosu-Ampong, 2024). Documentation served as supporting data and included course documents, digital learning materials, student assignments, and other records based to the use of technology in academic contexts (Sanasintani, 2023).

The researcher act as the main tool for collecting and analyzing data. To facilitate the research process, several supporting instruments were employed, including interview guidelines, observation sheets, and documentation records. Interview guidelines focused on AI perceptions in learning activities (Schmidt et al., 2025). The general framework of the interview instrument used in this study is presented in Table 1. Prior to its use in the field, the validity of the interview instrument was established through expert judgment and a limited pilot test. Expert validation was conducted by two academic experts in educational technology and qualitative research methodology to assess the clarity, relevance, and alignment of the interview questions with the research objectives. Based on their feedback, several revisions were made to improve wording clarity and conceptual alignment. In addition, a pilot study was carried out with a small group of respondents who were not included in the main study to ensure the comprehensibility of the questions and the effectiveness of the instrument in eliciting relevant information. These validation procedures ensured that the interview instrument was appropriate, valid, and ready for data collection in the field.

Table 1 Interview Instrument Framework for Investigating Readiness, Perceptions, and Implementation of Artificial Intelligence in Learning

Aspect Examined	Indicators	Focus of Questions
AI readiness	Ability to use digital technologies	Experiences of lecturers and students in using digital devices and technology-based applications
	Availability of devices and internet access	Availability of supporting devices and internet access for technology use in learning
Perceptions of AI	Perceived benefits of AI	Lecturers' and students' perspectives on the advantages of artificial intelligence in facilitating learning processes and supporting academic tasks
	Ease of technology use	The extent to which users perceive AI-based applications as easy to operate and integrate into learning activities.
AI implementation	Frequency of AI use	The level of regularity with which AI tools are utilized during instructional and academic activities.
	Forms of AI utilization	Various approaches through which artificial intelligence is applied to enhance learning processes and academic work.

The analysis process was carried out concurrently with data collection, allowing the researchers to continuously interpret, organize, and refine the emerging

information throughout the study (Holland & Ciachir, 2025). The analysis through data reduction, data display, and conclusion drawing. Data reduction filtered and simplified data to focus on information aligned with research goals. Reduced data were arranged narratively for clear interpretation. Finally, conclusions were drawn through an interpretative process aimed at identifying patterns, relationships, and meanings related to users' readiness, perceptions, and the implementation of AI in learning activities (Tierney et al., 2024).

To ensure credible findings, validation used source and method triangulation (van den Berg, 2024), which involved comparing data collected from interviews, observations, and documents to ensure consistency across data sources (Sadykova & Kayumova, 2024). Credibility was further strengthened through member checking, in which selected participants were provided with transcribed interview data and preliminary findings to review, confirm, and clarify the accuracy of the interpretations. Participants were given the opportunity to correct, refine, or elaborate on the researcher's interpretations prior to final analysis, ensuring that the findings accurately reflected their intended meanings and minimizing the risk of misinterpretation. In addition, dependability and confirmability were ensured through systematic documentation of the research process and careful interpretation of the data (Pinatil & Ramos, 2023). Ethical considerations were also strictly observed, as participants were fully informed about the study purpose and participated voluntarily (Refat et al., 2025). while their identities were kept confidential and all data were used solely for research purposes (Humble & Mozelius, 2023).

RESULTS

The results presented in this study were obtained from qualitative data gathered through interviews, field observations, and document analysis involving lecturers and students of the *PGPAUD* Program at Universitas Mataram. The analysis concentrated on three principal aspects that form the focus of this research: readiness for the use of *AI*, perceptions of AI technology, and the implementation of AI within learning activities. These aspects were examined collectively to understand how AI technology is introduced, interpreted, and utilized within the teaching and learning processes in the program.

The results show that most lecturers and students demonstrate a relatively adequate level of readiness in utilizing digital technologies. This readiness is reflected in their expertise in using digital tools, online platforms, and academic support technologies. Digital technologies have become an essential component of everyday learning practices, particularly for searching academic references, preparing assignments, processing information, and generating ideas during the learning process. These findings indicate that the learning environment within the program has begun to adapt to the rapid development of digital technologies in academic contexts.

However, this readiness is primarily associated with general digital technology use rather than specific engagement with AI technologies in learning. Several informants reported that their familiarity with AI-based applications emerged through independent exploration, such as internet use, social media, or peer recommendations. This indicates that exposure to AI remains informal and is not supported by structured academic mechanisms. The findings suggest that AI understanding and use are still individually driven and have not been systematically embedded into formal academic practices.

This condition is further reinforced by the limited availability of formal training related to AI utilization in education. Most participants stated that they had never

participated in training programs specifically addressing the application of AI technologies in educational settings. As a result, the use of AI largely depends on individual initiative to explore and experiment with available tools, such as using AI to search for references or assist in preparing learning materials, as reported by some lecturers.

This situation can be attributed to several institutional constraints, including the absence of clear policies or guidelines for AI integration, limited professional development opportunities, and a continued emphasis on conventional instructional approaches. In addition, disparities in digital infrastructure and institutional capacity further hinder systematic implementation. Consequently, AI adoption tends to rely on personal initiative rather than coordinated institutional support, highlighting the need for structured policies and targeted capacity-building programs in higher education.In terms of perception, the discoveries that both lecturers and students broadly grip favorable attitudes toward the use of AI technologies in learning activities. Informants perceived AI as a tool that facilitates various academic tasks, including retrieving information, generating ideas for academic writing, and supporting faster comprehension of learning materials. AI technologies are also viewed as capable of improving efficiency in completing academic tasks, particularly in processing information and generating ideas.

Furthermore, AI is perceived to offer opportunities for more flexible and interactive learning experiences. Students reported that AI-based applications help them understand certain concepts more easily through explanations that are clearer and easier to follow. From the lecturers' perspective, AI technologies can function as supplementary resources for developing learning materials and enriching teaching strategies in the classroom. With the presence of these technologies, learning activities are no longer restricted to conventional sources but are supported by diverse digital and adaptive learning resources.

Despite these positive perceptions, several concerns were also expressed regarding the use of AI in learning. Some lecturers noted that excessive dependence on AI technologies may reduce students' reasoning abilities and independent learning skills, particularly when AI tools are used directly to complete academic tasks without sufficient analytical engagement. Such concerns highlight the risk that students may become overly reliant on technological tools in completing academic assignments. These concerns can be interpreted from an ethical perspective in AI in education, particularly in relation to academic integrity and human agency in learning. From a deontological standpoint, uncritical use of AI may challenge principles of academic honesty by shifting intellectual effort from learners to automated systems. Furthermore, from a constructivist perspective, overreliance on AI may weaken students' active knowledge construction processes, which are essential for developing higher-order thinking skills. Overall, these findings suggest that while AI is perceived positively in terms of its pedagogical benefits, its use must be carefully regulated to ensure that it supports rather than replaces students' cognitive engagement and independent learning.In terms of learning practices, the findings show that the implementation of AI technology within learning activities in the *PGPAUD* Program at Universitas Mataram is still at an early stage. Most AI use is limited to individual learning support activities among students, such as searching for references, generating ideas for writing, or assisting in understanding learning materials. The integration of AI into formal classroom instruction has not yet become a systematic component of teaching strategies developed by lecturers.

Several lecturers acknowledged that they are still in the initial increments of exploring various AI-based applications and have not yet fully understood how such technologies can be successfully incorporated into teaching routines. Consequently,

the use of AI in instructional activities remains limited and has not yet been incorporated into structured instructional planning.

The study also identified several challenges related to the implementation of AI technologies in education. These challenges include limited understanding of AI applications, insufficient training related to AI-based learning technologies, and lack of institutional rules regulating AI use in academic process. As a result, the utilization of AI in learning remains sporadic and has not yet developed into a systematically integrated educational practice. **Table 2** summarizes the findings for a clearer overview of the examined aspects.

Table 2 Summary of Findings on AI Readiness, Perceptions, and Implementation in Learning

Aspect	Identified Condition	Characteristics of Findings
AI readiness	Lecturers and students demonstrate adequate readiness in using digital technologies	Good mastery of digital devices, but limited understanding of AI
Perceptions of AI	Generally positive perceptions	AI is perceived as helpful for improving learning efficiency and information access
AI implementation	Implementation remains limited	AI use is mostly individual and not yet systematically integrated
Implementation challenges	Several structural constraints identified	Limited training, technological understanding, and institutional guidelines

Overall, the findings indicate that AI technologies have begun to be recognized and utilized by lecturers and students in academic activities within the *PGPAUD* Program at Universitas Mataram. Users demonstrate a relatively adequate level of digital readiness, and perceptions toward AI tend to be positive. Nevertheless, the integration of AI into formal learning activities remains limited and has not yet been optimally developed. Findings indicate AI in education needs stronger support, training, skills, and clear integration policies.

DISCUSSION

The findings indicate that lecturers and students show a fairly sufficient readiness in using digital technologies. These findings suggest that digital readiness among lecturers and students primarily reflects operational familiarity with digital tools rather than pedagogical readiness to incorporate emerging technologies like AI into organized learning settings. In this context, digital competence is manifested mainly in the use of technology for supporting academic tasks, including information retrieval, reference searching, and assignment preparation, rather than for transforming instructional strategies, a condition that is also observed in previous studies on digital readiness in higher education (Budiyanto et al., 2024). However, this readiness has not yet translated into the systematic blending of AI in instructional practices (Ren & Wu, 2025). This condition suggests that technological readiness in education is not limited to technical competence in operating digital devices but also involves pedagogical capability in integrating technology into teaching strategies (McPhee & Jerowsky, 2025). Functional relies on the link between tech knowledge, pedagogy, and subject expertise in tech-based learning (Ajani, 2024).

This finding is consistent with the concept of Technological Pedagogical Content Knowledge (TPACK), which emphasizes that effective integration of technology requires educators to combine technological competence with pedagogical strategies and disciplinary knowledge. In the context of the *PGPAUD* Program at Universitas

Mataram, the limited integration of AI technologies indicates that this integration has not yet fully reflected the balanced interplay of technological, pedagogical, and content knowledge as proposed in the TPACK framework. This condition is not entirely unique to Universitas Mataram, as similar patterns have also been reported in other higher education institutions. For instance, studies in several Indonesian universities have shown that AI and digital technologies are often used at a basic level without being systematically embedded into pedagogical design, mainly due to limited training and uneven digital literacy among lecturers and students. Comparable findings have also been reported in international contexts, where universities in developing and even some developed countries still face challenges in fully operationalizing TPACK in relation to emerging AI tools, particularly in teacher education programs.

These comparative insights suggest that the phenomenon observed at Universitas Mataram reflects a broader global trend in higher education rather than an isolated case. Therefore, strengthening AI integration in *PGPAUD* requires not only individual technological competence but also institutional efforts to support the balanced development of TPACK among educators and students. technological knowledge and pedagogical practice has not yet fully developed. Although lecturers are capable of using digital tools, the transformation of these tools into structured learning strategies remains limited. This condition reflects the early stage of technology–pedagogy integration within the instructional practices observed in this study (Latorre-Medina & Abdelmaula-Mesaud, 2025). Although lecturers demonstrate adequate digital competencies, AI technologies have not yet been systematically incorporated into instructional design (Arvin et al., 2023). As a result, AI technologies are primarily used as supplementary tools rather than as structured elements within learning strategies (Karimova et al., 2025).

Low AI use is linked to limited experience and insufficient training in educational applications (Jambunathan, 2025). Most lecturers and students reported that their familiarity with AI technologies developed through independent exploration rather than through institutional training initiatives (Su & Yang, 2022). Consequently, the use of AI remains largely individual and has not yet evolved into a structured educational practice (Vieriu & Petrea, 2025). Technological competence in education depends on individual skills and institutional support like training, guidance, and policy (Schmidt et al., 2025). Without such support, technological innovations tend to develop in fragmented ways and remain insufficiently integrated within learning processes (Zhang et al., 2023).

Lecturers and students generally hold positive views toward using AI in learning activities (Alshamy et al., 2025). AI is seen as a tool that enhances learning efficiency and supports understanding (Hutson et al., 2022). These perceptions suggest that users recognize the practical benefits of AI in supporting academic tasks (Sustaningrum & Haldaka, 2025). In TAM, technology acceptance depends mainly on perceived usefulness. In this study, both dimensions can be observed in the participants' responses. Lecturers and students perceived AI applications as useful tools that help them access information more efficiently and support academic tasks. At the same time, the relatively simple interface of many AI-based applications encourages users to experiment with these tools independently. These perceptions contribute to the gradual acceptance of AI technologies within academic activities (Shata & Hartley, 2025). When a technology is considered beneficial and easy to operate, individuals are generally more willing to adopt and use it within academic contexts (Bamasoud et al., 2025).

However, positive perceptions toward technology do not automatically lead to extensive implementation in instructional practices (Spivakovsky et al., 2023).

Although lecturers and students demonstrate favorable attitudes toward AI technologies, their actual use within classroom learning remains relatively limited (Balabdaoui et al., 2024). This condition reflects a gap between technological acceptance and its practical application in educational settings (Ramli et al., 2025). Such a gap may occur due to several factors, including limited knowledge of AI fusion in learning methods, insufficient experience in designing technology-supported instruction, and the absence of clear guidelines regulating the use of AI in academic activities (Chai et al., 2025). Without a clear implementation framework, technologies tend to be used primarily as individual learning aids rather than as structured components within instructional design (Kozan et al., 2025). Beyond individual readiness and perception, the use of AI in education is also influenced by systemic factors related to institutional support (An et al., 2025). Without clear policies, lecturers carefully integrate AI into teaching practices (Selmi Arrooqi & Miqad Alruqi, 2025). Successful tech integration relies on user readiness and supportive institutional policies for innovation (Secreto et al., 2025). Institutional support is key to fostering technology-driven teaching innovation (Towfek et al., 2024).

AI embracement in learning shows that educational technology is usually adopted gradually. The use of AI within the *PGPAUD* Program appears to correspond with the initial stages of technological embracement. A small number of lecturers and students have begun experimenting with AI tools to support learning activities, while broader institutional integration has not yet occurred. This situation indicates that AI adoption remains exploratory and depends largely on individual initiative rather than institutional policy (Faisal Rashid et al., 2024). In the early stages, new technologies are usually adopted by a limited group of users who demonstrate strong interest in technological innovation (Spathopoulou et al., 2025). Over time, the adoption of such technologies may expand into broader educational practices as users gain more experience and institutional support increases. AI use in learning is still early, with lecturers and students exploring tools without systematic integration (Brown et al., 2025).

Furthermore, the relationship between users' perceptions and their readiness to adopt technology can be observed in the use of AI in academic activities (Kim et al., 2025). Individuals who hold positive attitudes toward technology are generally more willing to experiment with and adopt technological tools in their learning processes (Alshamy et al., 2025). Conversely, when users perceive technology as less beneficial, their willingness to adopt such innovations tends to decline (Shofiah & Putera, 2024). Therefore, perceptions of technology play a significant role in shaping users' readiness to engage with technological developments in educational contexts (Joseph et. Al., 2024).

However, positive perceptions and technological readiness alone are insufficient to ensure optimal implementation if they are not supported by an institutional environment that promotes pedagogical innovation (Rughiniș et al., 2025). The development of AI utilization in education entails a comprehensive style that goes beyond strengthening individual competencies and also emphasizes the importance of institutional support systems. Such support may include professional development programs for lecturers and students, institutional policies regulating AI use in learning activities, and curriculum initiatives that systematically integrate digital technologies into educational practices (Chai et al., 2025).

This study found that the AI integration in higher education is shaped by tech readiness, user perceptions, and institutional support. While lecturers and students demonstrate positive attitudes toward AI technologies, the omission of arranged guidance and training limits their skills to integrate these tools into pedagogically

meaningful learning practices. Conceptually, the findings suggest that the use of Artificial Intelligence in education can be understood through the interaction between technological readiness, user perceptions, and the level of implementation within learning practices (Abulail et al., 2025). TPACK integrates technology, pedagogy, and content, while TAM focuses on usefulness and ease of use (Ye & Cao, 2025). Meanwhile, the diffusion of innovation perspective explains that technology adoption in education develops gradually, beginning with exploratory use by early adopters before expanding into wider institutional practices (Al-Zahrani & Alasmari, 2025). Further, development of AI utilization in education requires a comprehensive strategy that strengthens technological competencies, enhances users' perceptions of technological benefits, and reinforces institutional support systems that encourage sustainable technological innovation in learning environments (Aldemir et al., 2025).

CONCLUSION

This study indicates that lecturers and students in the Early Childhood Teacher Education Program (*PGPAUD*), Faculty of Teacher Training and Education, Universitas Mataram, demonstrate a relatively adequate level of readiness in utilizing digital technologies; however, this readiness is mainly reflected in the operational use of digital tools rather than in the pedagogical integration of *AI* within instructional practices. Although digital devices and online platforms are widely employed to support academic activities such as accessing information, preparing assignments, and developing learning materials, the systematic integration of AI into teaching and learning processes remains limited. The findings further reveal that both lecturers and students perceive AI positively, particularly in terms of improving efficiency, accelerating access to information, and supporting learning processes; nevertheless, these perceptions have not yet translated into consistent implementation, as AI use largely depends on individual initiative rather than structured institutional support. This situation is reinforced by the lack of targeted training, clear guidelines, and comprehensive policy frameworks that specifically regulate AI integration in higher education. From a conceptual perspective, these findings highlight that effective AI integration is shaped by the interaction of technological readiness, user perceptions, and institutional support systems, and can be interpreted through the lenses of the Technological Pedagogical Content Knowledge (TPACK), Technology Acceptance Model (TAM), and Diffusion of Innovation frameworks, indicating that sustainable AI adoption requires not only enhanced technological and pedagogical competencies but also positive perceptions and strong institutional governance. Accordingly, universities are recommended to implement structured AI capacity-building programs such as hands-on workshops on AI-assisted instructional design, AI-supported assessment, and the development of interactive learning media, alongside the formulation of institutional policies that address ethical use, academic integrity, acceptable AI usage boundaries, and integration of AI literacy into teacher education curricula; however, this study is limited by its single-institution scope, relatively small sample size, and qualitative design, which restrict generalizability, thus future research is encouraged to involve multiple institutions, larger samples, and mixed-method approaches to provide a more comprehensive understanding of AI integration in higher education.

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ETHICAL CONSIDERATIONS

Ethical considerations were carefully addressed throughout this study. Prior to data collection, permission was obtained from the relevant authorities within Universitas Mataram. Participants were informed about the purpose and procedures of the study and voluntarily agreed to participate through informed consent. Participation was entirely voluntary, and participants had the right to withdraw from the study at any time without any consequences. To ensure confidentiality and anonymity, no personal identifying information was disclosed in the reporting of findings. Data collected from participants were used solely for academic purposes and stored securely. Given the focus on Artificial Intelligence in Education, particular attention was also given to responsible use of digital technologies and the protection of participants' privacy.

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CONFLICT OF INTEREST

The author hereby declares that this research is free from conflicts of interest with any party.

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