

Preschool Teachers' Perceptions and Readiness in Adopting Artificial Intelligence (AI) for Learning: A Survey Data Analysis Study 2025

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Abstract: This study aims to analyze the perceptions, understanding, readiness, and needs of kindergarten teachers regarding the implementation of Artificial Intelligence (AI) in early childhood education based on internal survey data collected in March 2025. The research method used a quantitative descriptive approach with a questionnaire distributed to kindergarten teachers at Raudhatul Athfal in Polewali Mandar Regency. The results show that teachers' understanding of AI varies, with the majority falling into the "Fairly Understand" category. Teachers assess AI's potential as very high, particularly for personalized learning and creativity development. The main challenges identified include infrastructure limitations, lack of training, concerns about the diminishing role of teachers, and alignment with moral and religious values. ChatGPT and Canva are the most popular AI tools used by teachers, with weekly usage intensity. The highest priority need for AI-based teaching modules is the development of moral and religious content. Most teachers are ready to adopt AI if provided with adequate training. The primary support needed is technical training on the use of AI tools. This study recommends the development of integrated AI modules, continuous training, the provision of infrastructure, and the integration of moral and religious values into AI-based learning in kindergarten.

Keywords: Artificial Intelligence, early childhood education, kindergarten teachers, perceptions, teaching modules, technology integration

I. INTRODUCTION

The development of Artificial Intelligence (AI) technology has penetrated various sectors, including education at the Early Childhood Education (PAUD) and Kindergarten (TK) levels. AI is beginning to be seen as having great potential to create more personalized, interactive, and creative learning experiences. The use of artificial intelligence in the field of education, particularly at the preschool level, has become a crucial discourse given its potential to enrich the teaching and learning process (Jalil, 2024). However, the success of this technology integration heavily depends on the perceptions, understanding, and readiness of teachers as the frontline implementers in the classroom. Nevertheless, the integration of AI in early childhood education presents its own challenges, particularly regarding teacher readiness and adequate infrastructure (Afandi & Kurnia, 2023). Therefore, it is important to analyze kindergarten teachers' perceptions and readiness levels regarding AI adoption, including their understanding of AI literacy and their ability to develop relevant AI-based learning materials (Kölemen & Yıldırım, 2025). Based on the results of an internal survey conducted in March 2026 among kindergarten teachers in Indonesia, this article presents an in-depth analysis of teachers' levels of understanding,

potential, challenges, experiences, and key needs regarding the use of AI in learning. This study examines how kindergarten teachers' perceptions and readiness can influence AI implementation, considering factors such as attitudes toward AI, perceived benefits and challenges, and self-efficacy in its use (Putera et al., 2024). This study will also examine how teachers' professional competencies and personal attitudes toward AI technology influence the pace of effectively implementing smart technology in the classroom (Sadykova & Kayumova, 2024). A deep understanding of teachers' attitudes and perceptions is essential because they are central agents in the successful and sustainable implementation of AI within the context of early childhood education (Mohammed, 2023).

Furthermore, synergy between school policies, parental support, and teacher commitment is crucial for creating a conducive and sustainable digital ecosystem for the entire school community in the context of AI implementation (Aldi & Hanif, 2026). The importance of school administrative support and regular teacher training has been proven to enhance the effectiveness of technology-based learning (Asih et al., 2026). Given the complexity of integrating AI into early childhood education, teacher competency development models should not rely solely on formal training but also integrate continuous education with intensive mentoring from expert mentors and active support from professional learning communities (Fadillah & Wardan, 2025). This approach will bridge the gap between theory and practice, ensuring that teachers not only understand the potential of AI but are also able to implement it effectively and ethically within the learning context (Dewi et al., 2025). A flexible approach to the training curriculum is also necessary to respond to the challenges of the digital age and the diversity of students (Pardiyawan et al., 2026). This model must also include the development of teachers' reflective skills to critically evaluate the effectiveness of AI within their pedagogical contexts, as emphasized by research on enhancing teacher autonomy through self-reflection.

II. METHODS

This study employs a survey method using both quantitative and qualitative descriptive approaches. The quantitative approach using a survey method was chosen to collect data on kindergarten teachers' perceptions and readiness to adopt AI (Fatimah et al., 2025; Rodríguez et al., 2024), as this approach allows for the systematic identification of patterns and trends related to factors influencing technology adoption among educators (Rusliana et al., 2026). The research instrument consisted of a structured questionnaire adapted from studies investigating teachers' views on the integration of AI in education to ensure validity and reliability (Uygun, 2024). The questionnaire was distributed online via the Google Forms platform to kindergarten teachers across Indonesia in March 2026, given the effectiveness of this method in large-scale educational surveys (Rohmah et al., 2023; Safitri et al., 2022). A total of 21 teacher respondents completed the questionnaire in full. The questionnaire was designed to measure teachers' familiarity with AI tools, their comfort and confidence in using them, perceptions regarding the benefits and challenges of AI adoption (Iddrisu & Iddrisu, 2025), as well as teachers' understanding of AI, preferences for AI-based learning methods, and views on its impact on the learning experience (Sanasintani, 2023). Quantitative data were analyzed using descriptive statistics, including frequency distributions and percentages, to provide a comprehensive overview of teachers' levels of readiness, familiarity, confidence, and general attitudes toward AI in an educational context (Lacuna, 2025).

In addition, to gain a deeper understanding, this study also adopted a qualitative approach. As suggested by previous studies, a mixed-methods approach allows for the integration of the strengths of quantitative data in identifying general patterns with in-depth qualitative insights to explain the nuances behind the numbers (AlKanaan, 2022; Prilop et al., 2025). In this study, open-ended responses from the questionnaire will be analyzed thematically. Additionally, semi-structured interviews with subgroups of teachers, school principals, and other key informants will be conducted to explore perceptions, experiences, and challenges not fully revealed through the questionnaire (Asidiqi & Adiputra, 2024; Triplett, 2023). Participant observation and analysis of related documents, such as lesson plans and semester programs, will also be conducted to identify the extent to which AI concepts have been integrated into the existing curriculum (Huriah et al., 2026; Wahfiyah & Pamungkas, 2023; Yusuf & Darmasnyah, 2025). Qualitative data analysis will follow the procedures of Miles and Huberman, ranging from data reduction, data presentation, to drawing conclusions (Nurfatmawati et al., 2023), using a thematic

approach to identify patterns and insights emerging from interview transcripts (AlAli & Wardat, 2024). The researcher acts as the primary instrument in data collection, actively participating in the interview, observation, and document analysis processes to ensure the depth and accuracy of the information (Jannah et al., 2023; Masturoh et al., 2024). The validity of the findings is strengthened through data source triangulation and methodological triangulation, which involves comparing findings from observations, interviews, and document analysis (Ihsan et al., 2023; Silvester et al., 2022; Soleha & Mujahid, 2024). The population in this study comprises kindergarten teachers in the Jakarta Capital Region and surrounding areas, with a sample of 21 kindergarten teachers who completed the questionnaire, as well as 3 kindergarten directors selected using purposive sampling, consistent with similar studies focusing on the Merdeka Curriculum (Setiawan et al., 2023). This technique can be combined with snowball sampling to gather accurate, in-depth, and representative information (Sutinah et al., 2026), ensuring that each participant possesses relevant understanding regarding the implementation of AI in the context of early childhood education (Agustinasari & Fiqry, 2025). This combined methodological approach will enrich our understanding of the complexities of AI adoption among preschool teachers by integrating statistical generalizations with narrative depth (Ifraheem et al., 2024).

III. RESULTS AND DISCUSSION

3.1 Teachers' Understanding of AI

The data indicates that kindergarten teachers' understanding of AI remains highly varied. Most teachers are at the "Fairly Familiar" level (knowing the basics of AI), but some still report being "Not Very Familiar" (having only heard of it) and even "Not Familiar at All." Only a small proportion of teachers possess in-depth knowledge of AI concepts and applications within the context of early childhood education. Implications: A massive, tiered AI literacy improvement program is needed for kindergarten teachers, ranging from an introduction to basic concepts to simple practical applications.

3.2 The Potential of AI in the Eyes of Teachers

The majority of teachers (75%) view the potential of AI as "Very Great, Potentially Revolutionary" in kindergarten learning, particularly for:

- a. Personalized learning: AI is considered capable of tailoring materials to each child's learning style and pace.
- b. Creativity development: The use of AI-based art generators and creative applications helps children express themselves.
- c. Increased interactivity: AI-based educational games and apps make learning more engaging.

However, a small portion of teachers (around 20%) assess the potential of AI as "Limited," citing that early childhood education requires a more human-centered approach and direct interaction from teachers.

3.3 Key Challenges in Implementing AI in Preschools

The survey identified four main challenges perceived by teachers, as presented in Table 1.

Table 1. Key challenges in AI implementation in preschool

Challenge	Description
Limited facilities/infrastructure	Many kindergartens do not yet have gadgets, stable internet access, or other supporting infrastructure.
Lack of training	Teachers do not yet have the necessary skills to integrate AI into learning.
Concerns about diminishing the teacher's role	There are concerns that AI will replace personal interaction and the human touch of teachers.

Challenge	Description
Alignment with moral/religious values	AI content needs to be adapted to align with cultural, moral, and religious values.

Survey data also indicates that some teachers highlight the challenge of "Alignment with RA's religious and moral values" as a particular concern, especially in religious-based preschool settings.

3.4 Use of AI Tools: Popular but Not Yet Intensive

Among the various AI tools available, ChatGPT and Canva are the most popular among preschool teachers. Some also use Gemini and digital worksheets.

- a. Frequency of use. Most teachers use AI on a weekly basis, indicating integration that is not yet intensive but is becoming consistent.
- b. User experience. The majority of teachers stated that AI is "Very Helpful" in supporting the learning process. A small portion stated it is "Somewhat helpful but requires manual refinement," particularly to tailor the output to the specific needs of young children.

3.5 Needs for AI-Based Teaching Modules

Based on the results of the needs assessment for the development of AI-based teaching modules for kindergarten, teachers identified several priorities divided into three main pillars, as well as one holistic, integrative need.

- a. Development of Moral Values and Character
 The top priority for kindergarten teachers is an AI module capable of supporting the development of moral values and character in young children. Teachers do not want values to be conveyed textually, but rather through interactive activities that allow children to directly experience noble values such as honesty, helping others, patience, and empathy. Example: an interactive story simulation where children choose between good and bad actions, and the AI provides friendly feedback aligned with the taught moral values.
- b. Engaging and Easy-to-Understand Religious Content
 Teachers need AI to present basic religious material—such as daily prayers, stories of prophets and religious figures, and spiritual foundations—in an engaging way suited to children's developmental stages. Desired formats include: short animations, interactive songs, prayer word-building games, and narrative stories with gentle audio and visuals.
- c. Artistic Creativity to Foster Imagination
 The AI module is also expected to stimulate children's artistic creativity through digital coloring activities, exploration of simple sounds and music, and interactive art such as symmetrical drawing or creating patterns from basic shapes. AI can serve as an "art playmate" that suggests colors, repeats melodies, or personally praises the child's artwork.
- d. Other Needs: An Integrated Module Combining Morality, Religion, and Art Under One Theme.
 A number of teachers mentioned "others," indicating a need for an integrative thematic approach. This means that teachers do not want modules that separate morality, religion, and art into different chapters, but rather modules that combine all three into a single learning theme.
 Example: the theme "The Story of the Kind-Hearted Prophet" → includes:
 Morality: helping a sick friend.
 Religion: a prayer for visiting the sick + a short story.
 Art: coloring a picture of a child visiting a friend or making a get-well card.
 Thus, AI is expected to be able to develop cohesive, interactive, and adaptive thematic learning scenarios tailored to the local context of each kindergarten.

3.6 Required Readiness and Support

Teacher readiness level:

- a. Ready with adequate training, Highest category. Teachers are willing to adopt AI provided they receive sufficient training.
- b. Very ready (have already tried it and want to improve). A small but progressive group.
- c. Not yet ready due to limitations. There are still teachers who feel unprepared due to a lack of resources or knowledge.

The most essential support needed:

- a. Technical training on the use of AI tools. The most dominant need (nearly 70% of respondents mentioned this).
- b. Provision of ready-made module examples. Teachers want concrete examples that can be adapted immediately.
- c. Infrastructure (devices, internet). Especially for kindergartens where access to technology is still limited.

IV. CONCLUSION

This study concludes that: (1) kindergarten teachers' understanding of AI varies and needs to be improved; (2) the potential of AI is considered very significant, particularly for personalization and creativity; (3) the main challenges are infrastructure and training, not resistance to technology; (4) teachers have already used AI (ChatGPT, Canva) and experienced its benefits; (5) the greatest need for modules is in the development of moral, ethical, and religious content; (6) most teachers are ready to adopt AI provided they receive adequate training.

Strategic recommendations:

- a. Development of Integrated AI Modules. AI-based teaching modules that integrate moral values, religion, and artistic creativity appropriate for the preschool context.
- b. Continuing Education. A technical training program on the use of AI tools (ChatGPT, Canva, Gemini) designed specifically for preschool teachers.
- c. Infrastructure Provision. Support for devices and internet access for kindergartens with limited resources.
- d. Promoting AI's Role as a Support Tool. Emphasizing that AI is an aid, not a replacement for the teacher's central role in children's character education.
- e. AI is not a threat to kindergarten teachers, but rather an opportunity to enrich learning if implemented wisely and contextually. With the right training, adequate infrastructure, and modules relevant to moral and religious values, AI can become an innovative partner in creating a generation of children who are intelligent, creative, and of noble character.

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