

# Perception of Primary School Teachers towards the Use of Artificial Intelligence (AI) In Teaching

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## ABSTRACT

This paper presents a comprehensive literature review relating to primary school teachers' perceptions of the use of artificial intelligence (AI) in teaching. AI in education refers to the use of intelligent technologies capable of supporting, analyzing, and personalizing the teaching and learning (PdP) process. This paper employs a literature review methodology by analysing previous research articles related to the use of AI in education, particularly those focusing on teachers' perceptions. Articles were selected from relevant academic databases based on specific criteria such as year of publication, relevance of topic, and educational context. This paper explores the current state of research in this field as well as identifying knowledge gaps for future studies. The literature review shows that teachers generally have a positive perception of the capabilities of AI, but there are still challenges in terms of readiness, training, and understanding of the technology. The findings suggest that more research needs to be conducted to better understand the level of teacher acceptance, the suitability of AI applications in the classroom context, and the forms of support needed. Overall, this paper acts as a platform for future research and strategies to support the implementation of AI technology in teaching at primary school level in Malaysia.

**Keywords:** Artificial Intelligence in Education, Teachers' Perception, Primary Education, Teacher Readiness

## INTRODUCTION

In this phase of the Industrial Revolution 4.0, digital and advanced technologies have transformed the educational landscape, with AI becoming one of the key tools with the potential to enhance 21st-century teaching and learning. AI refers to the ability of computer systems to mimic human intelligence, such as learning, reasoning, and problem-solving (Luckin et al., 2016). In education, AI is applied through intelligent tutoring systems, personalised learning, assessment automation, and learning analytics (Zawacki-Richter et al., 2019).

By analysing data and student behaviour, AI enables teachers to identify student needs more quickly and accurately. This aligns with student-centred pedagogical approaches, such as those provided by adaptive learning systems and early feedback through learning analytics (Holmes et al., 2022). AI not only benefits teaching and learning but also supports teachers in making better and more informed pedagogical decisions.

In Malaysia, policies such as the Malaysian Education Development Plan (PPPM) 2013–2025 and the Digital Education Policy (2021) demonstrate the government's commitment to adopting advanced digital technology. These policies prioritise the development of teachers' digital skills, including the use of AI technology. However, the positive outcomes of using this technology depend on several factors, including teachers' perceptions and their willingness to adopt it. Primary school teachers, in particular, play a crucial role in educating students during the early stages of learning. Therefore, their support for AI is essential.

Teachers' perceptions of AI influence their motivation and likelihood to use it. A positive attitude can increase the probability of integrating AI, while a negative attitude may lead to concerns about the replacement of the teacher's role or a lack of understanding, which can affect its use (Yu, 2022). This perception is often shaped by the level of knowledge, training, technical skills, and organisational support (Viberg et al., 2020).

Ongoing training and support are considered important factors in improving teachers' positive attitudes towards AI (Li et al., 2021). However, various obstacles such as time constraints, high workloads, and inadequate infrastructure persist in many primary schools in Malaysia, affecting the level of teacher preparedness.

Some countries, such as South Korea and China, have demonstrated positive results in the use of AI in primary schools, but these efforts are supported by intensive training, infrastructure support, and close monitoring. In Malaysia, AI adoption is still in its early stages and requires a relevant approach.

Therefore, studying primary school teachers' perceptions and readiness for AI is crucial for devising a focused and realistic professional development strategy. The findings of this study can assist stakeholders in formulating policies and interventions that are more effective and appropriate for the local context. As each school has different backgrounds and needs, a flexible and reality-based approach in the classroom is key to a successful digital transformation of education.

## LITERATURE REVIEW

### Artificial intelligence (AI) in Education

AI is defined as the ability of machines to mimic human intelligence functions such as decision-making, learning, and problem-solving. In education, AI is receiving increasing attention because of its cutting-edge potential to enhance teaching and learning processes. According to Holmes, Bialik and Fadel (2019), the use of AI in education includes applications such as adaptive learning systems, educational chatbots, automated assessments, and virtual assistants that support both teachers and students in the classroom and outside school hours. A study by Zawacki-Richter et al. (2019) also noted that AI can shape more responsive and innovative learning experiences.

One of the main advantages of AI in education is its ability to support personalised learning, where content and assignments are tailored to the student's ability level. Woolf (2019) explains that AI can save teachers time by providing feedback and automatically evaluating assignments. Furthermore, according to Tang, Lim and Abdul Rahman (2021), AI enables teachers to analyse student learning patterns based on performance data, allowing them to plan more effective interventions. This capability makes teaching more efficient, responsive, and evidence-based.

However, the implementation of AI in education also faces challenges such as the level of technological literacy among teachers, ethical issues, student data privacy, and school infrastructure constraints. Williamson and Eynon (2020) argue that the effectiveness of this technology depends greatly on teachers' perceptions of AI. In this regard, Ahmad and Halim (2023) state that teachers' understanding and acceptance of AI should be emphasised through professional training, technical support, and comprehensive education policies.

### Perception of Primary School Teachers towards the Use of AI

Primary school teachers' perceptions of the use of AI play a major role in determining whether it can be widely adopted in the classroom. Therefore, this literature review focuses on three main aspects in assessing primary school teachers' perceptions of AI, the perceived benefits, the ease of use of technology, and the social influences that drive its adoption.

In general, the benefits of AI in education include the personalisation of learning, automation of administrative tasks, and increased teaching efficiency. In a study by Alghamdi and Holland (2020), teachers who viewed AI as a tool to improve student achievement and accelerate the learning monitoring process showed a higher tendency to accept its use. In primary schools, AI's ability to tailor content to students' individual needs is particularly beneficial for teachers who face varying levels of ability in the classroom.

In Malaysia, Rahim et al. (2021) reported that teachers are beginning to recognise the potential of using AI-based learning systems such as educational chatbots and learning analytics applications to improve student assessment and feedback. These systems can save teachers time, provide automatic recommendations, and help them make more informed teaching decisions. Hasin and Nasir (2022) added that AI can facilitate student data management and improve the effectiveness of academic monitoring.

However, not all teachers share the same positive perception. Che Ahmad et al. (2020) showed that teachers are concerned about the loss of human value in education when technology takes over most teaching tasks. In addition, some teachers feel that AI can reduce direct interaction between teachers and students, which is an important element of basic education.

While AI promises various benefits, the ease of use of this technology also influences how well it is accepted by teachers. According to the Technology Acceptance Model (TAM) developed by Davis (1989), the perception of ease of use is a major factor in determining acceptance. In Malaysia, a study by Hamzah and Daud (2020) showed that many teachers found AI difficult to use due to a lack of adequate training and exposure.

Furthermore, Mohamad and Kamarulzaman (2021) found that teachers with a high level of digital literacy are more confident in exploring new technologies such as AI. In contrast, teachers who lack ICT skills face significant challenges in understanding and operating AI systems. This becomes more difficult when school infrastructure, especially in rural areas, does not fully support the use of advanced technologies such as AI (Ismail et al., 2022). Problems such as a lack of devices, slow internet connections, and the absence of constant technical support prevent teachers from widely using AI.

However, there is a generational difference among teachers. Norazman et al. (2023) showed that younger teachers, who are more exposed to technology, tend to view AI as easy to use, especially when it features a user-friendly interface and interactive tutorials. This demonstrates that both experience and the level of exposure to technology play important roles in shaping perceptions of ease of use.

In addition to individual perceptions, social factors also influence teachers' attitudes towards the use of AI. In the primary school context, social influence can come from school administrators, peers, parents, and national education policies. Alias and Mahamod (2021) emphasise that teachers who receive support from principals and school administration are more likely to accept AI technology. Encouragement to attend training and the provision of incentives also affect teacher acceptance.

Colleagues also play an important role. Yusof et al. (2022) noted that a work culture supporting the use of technology, including best practice sharing sessions and professional collaboration, can increase teachers' confidence in AI. Teachers are more open to experimentation when they observe the effectiveness of AI use by their peers.

At the policy level, the efforts of the Ministry of education through the implementation of initiatives such as DELIMa, My Digital, and the introduction of the digital curriculum provide a clear indication of the importance of technology integration in education. The MOE (2021) aims for all teachers to take advantage of digital technology, including AI, as a teaching support tool. However, as stated by Hasin et al. (2022), the change in attitude towards AI did not occur overnight. It requires time, ongoing training, and both moral and technical support from all parties.

This literature review shows that primary school teachers' perceptions of the use of AI in teaching are influenced by three main factors such as perceived benefit, level of ease of use, and social influence. In general, teachers are aware of the benefits of AI in improving the efficiency and quality of teaching. However, barriers related to technological skills, infrastructure, and social support play a significant role in determining their level of acceptance and readiness.

To ensure that AI can be used effectively in primary schools, education authorities need to focus on structured training, build robust infrastructure, and create an ecosystem that supports the application of AI. Teachers should be guided to understand not only how to use AI, but also how to integrate it pedagogically and ethically in the classroom. Only with a holistic approach can AI be fully utilised in primary education in Malaysia.

### **The Readiness of Primary School Teachers to Use AI in Teaching**

Teacher readiness refers to the level of preparedness and willingness of teachers to effectively apply AI technology in teaching and learning. It involves not only technical competence, but also mental attitude, pedagogical skills, and the ability to face changes and new challenges in the educational ecosystem (Ertmer & Ottenbreit-Leftwich, 2019). A study by Hsu et al. (2021) showed that the readiness of primary school teachers is closely related to the level of training and actual experience in using technology. Teachers who attend formal training and receive practical guidance demonstrate a higher level of readiness because they have the confidence to integrate AI into existing curricula.

In addition, psychological factors such as fear of technology, lack of self-confidence, and time constraints also have a direct impact on the level of teacher readiness. Oye et al. (2020) pointed out that teachers experiencing high work pressure or a lack of time may be less motivated to try new technologies, especially if not accompanied by ongoing technical and emotional support. Systemic support and a phased approach to technology implementation are therefore essential to strengthen this readiness.

More importantly, teachers' perception of the usefulness and relevance of AI in their teaching context is also a key determining factor. If teachers view AI as a tool capable of improving teaching effectiveness, saving time, or helping students achieve better learning outcomes, they will be more motivated to use it (Li & Wang, 2022). Thus, it is clear that teachers' readiness does not exist in isolation, but is closely related to their perception of the benefits, convenience, and social support associated with the use of AI. Therefore, school administration and policy makers need to emphasise increasing positive perceptions through exposure, training, and incentives, so that teacher readiness can be fostered comprehensively and sustainably.

**Past Related Studies**

	Title	Authors	Year	Perception	Readiness	Primary School	Data Analysis	Country
1	The Readiness of Malay Language Teachers to Implement Artificial Intelligence in Teaching and Learning	Nur Udhwa Ashikin Mohd Rani, Nurin Hanisah Roslan & Nur Syafiqah Abdul Wahid	2025	/	/	/	Quantitative	Malaysia
2	Teachers' Perception of the Use of Artificial Intelligence (AI) in Teacher Instruction at the Secondary School Level	Ting Siew Chear & Helmi Norman	2024	/	/		Quantitative	Malaysia
3	Primary Teachers' Perspectives on Using Artificial Intelligence Technology in English as a Second Language Teaching and Learning: A Systematic Review	Nur Sakinah Zulkarnain & Melor Md Yunus	2023	/		/	SLR	Malaysia
4	Teacher's Readiness Level for Using Artificial Intelligence (AI) Based on Teaching Experience	Rajeswary A/P Nerasaman & Mohd Jasmy Bin Abd Rahman	2025	/	/	/	Quantitative	Malaysia
5	Development of Artificial Intelligence-Based Self-Learning Materials for the Heat Topic Among Form Four Students: Needs Analysis Based on Teacher Perceptions	Muhammad Syarifuddin Abd Razak, Suriani Abu Bakar, Anis Nazihah Mat Daud, Nurazreen Mohd Ghazali, Azzam Abu Bakar, Hamdan Hadi Kusuma dan Silvi Yulia Sari	2024	/			Quantitative	Malaysia
6	The Attitudes and Motivation of Chinese	Azura Senawi, Tumisah	2025	/			Qualitative	Malaysia

	Independent Secondary School Malay Language Teachers in Applying Artificial Intelligence for Teaching Malay as a Second Language	Sarimin, Sharmilaadevi Nagaretnam						
7	Perception of Chemistry and Mathematics Trainee Teachers towards the Use of ChatGPT in Education	Nur Iman Kaswadi & Lee Tien Tien	2024	/			Quantitative	Malaysia
8	Level of Knowledge and Frequency of Use of Artificial Intelligence (AI) Powered/Assisted Applications Among DIT & DDT Students at JTMK and TVET Foundation Students at JMSK in Politeknik Ungku Omar: A Survey Study	Khairul Anuar Bin Haji Mohd Radzali, Zainab Binti Haji Hassan & Haji Mohd Hamzi Bin Haji Mohd Safian	2024	/	/		Quantitative	Malaysia
9	Exploring Educators' Perceptions of the Use of Information and Communication Technology in the Teaching and Learning Process	Sylvia Tesalonica Berandah & N.K. Tharshini	2024	/	/		Qualitative	Malaysia
10	Analysis of the Challenges of Integrating Artificial Intelligence in Primary School Education	Ageng Surat Cakraningtyas, Ivrandia Alinta Syaharani, Bramantyo Susilo	2025	/	/	/	Qualitative	Indonesia
11	Perception of English Education Students on the Use of AI in English Language Teaching	Syahira, Kartini, Sulistiyahadi, & Sigit Prafiadi	2023	/			Qualitative	Indonesia
12	Teachers' Perceptions of Artificial Intelligence in Madrasahs: Between Acceptance and Challenges	Abdul Kadir Ahmad, Kun Mardiwati Rahayu	2024	/	/		Quantitative & Qualitative	Indonesia
13	Perception of Mathematics Teacher Candidates towards the Utilization of Artificial Intelligence Technology in the Context of Learning	Harnawati & Uly Hidayati	2024	/			Quantitative	Indonesia
14	The Role of Artificial	Mariana Elena	2024	/	/	/	Qualitative	Romania

	Intelligence in School Leadership	Doman						
15	Teachers Perceptions of Using an Artificial Intelligence-Based Educational Tool for Scientific Writing	Kim Nam Ju & Kim Min Kyu	2022	/		/	Qualitative	United State

The study elaborates on a total of 15 researches examining teacher perceptions as well as preparedness and challenges in the use of AI in education, particularly in the primary school context, from 2019 to 2025. These researches involved various backgrounds of respondents, with around 7 studies directly involving primary school teachers as the main participants, while the rest focused on teacher trainees, secondary school teachers, students and general educators. Most of the studies were conducted in Malaysia with a total of 9 studies, followed by Indonesia with 4 studies, while one study each was conducted in Romania and the United States.

In terms of methodology, a total of 7 studies using quantitative methods, followed by 6 qualitative studies, one Systematic Review study (SLR) and one study using a mixture of qualitative and quantitative methods. These various research approaches enable a broader and deeper insight into the perception and level of readiness of teachers in applying AI in the teaching and learning process. Here is a review of some selected research articles.

A study by Nur Udhwa Ashikin et al. (2025) examined the readiness of Malay primary school teachers to implement AI and found their readiness level was moderate. Although teachers demonstrated some awareness of AI, they showed limited technical knowledge and an incomplete understanding of AI applications in education. This is consistent with the findings of Alamri and Sabri (2024), who highlighted the need for continuous professional development and training to enhance teachers' confidence in using AI tools, such as intelligent assistants and learning analytics in the classroom.

Regarding positive perceptions, a systematic review by Zulkarnain and Yunus (2023) found that primary school teachers generally view AI as a potential tool to enhance teaching effectiveness, particularly in the instruction of English as a second language. Teachers reported that AI could support self-directed learning, student interaction, and personalised learning tailored to individual student needs. However, the study also emphasised significant challenges, including limited infrastructure, insufficient devices, unstable internet connectivity, and low digital literacy among teachers. Comparing this with the findings of Nur Udhwa Ashikin et al. (2025), it is evident that while teachers hold generally positive attitudes towards AI, external factors such as institutional support and technological resources critically influence the extent to which AI can be effectively applied.

Furthermore, Rajeswary Nerasaman and Mohd Jasmy (2025) highlighted that teaching experience affects AI acceptance. More experienced teachers demonstrated higher acceptance levels and were more willing to integrate AI in teaching and learning compared to novice teachers. This suggests that professional exposure and practical teaching experience enhance teachers' confidence in adopting new technologies, supporting the findings of Tan and Chong (2021), who emphasised that experienced teachers adapt more readily to technological innovations in the classroom.

A study by Razak et al. (2024) explored the use of AI-supported self-learning materials in science. Teachers received the implementation of these materials positively, as AI facilitated learning tailored to individual student needs, thereby improving teaching effectiveness. Nevertheless, teachers recommended improvements in system support and continuous training, indicating that positive acceptance must be accompanied by adequate infrastructure and professional development. These findings are consistent with Chen and Lee (2023), who demonstrated that AI-supported educational materials positively influence student motivation and engagement, but their effectiveness relies on teachers' ability to manage the technology effectively.

Kaswadi and Tien (2024) focused on pre-service teachers and their perceptions of AI tools such as ChatGPT. Although pre-service teachers expressed interest in AI, they reported a need for more practical exposure and pedagogical training to integrate AI effectively into classroom teaching. This highlights that interest alone is insufficient; practical training and pedagogical understanding are critical to ensuring AI is applied successfully.

Overall, when comparing these studies, it is evident that primary school teachers generally hold positive but cautious perceptions towards AI use, influenced by teaching experience, training, and institutional support. Most teachers recognise AI's potential to enhance teaching effectiveness, such as facilitating differentiated learning, increasing student engagement, and promoting self-directed learning. However, challenges such as insufficient professional training, limited technical skills, and inadequate infrastructure remain significant barriers. Therefore, to fully leverage AI in primary school education, professional development focused on pedagogical integration, ongoing institutional support, improved digital infrastructure, and approaches tailored to teachers' experience levels are essential (UNESCO, 2021; OECD, 2024). Such measures ensure that AI is not only positively received but also effectively implemented in teaching and learning.

## CONCLUSION

These studies highlight the importance of providing structured professional training, robust technical support, and relevant pedagogical approaches to enhance teachers' positive perceptions of using AI. Positive perceptions, such as viewing AI as a useful, easy-to-use tool capable of supporting teaching and learning (T&L), play a crucial role in fostering a proactive attitude among teachers towards technology. In contrast, negative perceptions, which may result from a lack of technical skills, insufficient school support, or uncertainty about the effectiveness of AI, often act as major barriers to its acceptance in the classroom. Therefore, teachers' readiness to accept and use AI is closely linked to their understanding, confidence, and belief in AI's potential to enhance teaching quality.

Based on these findings, several implications for educational practice in primary schools emerge. First, AI-related training should be provided continuously and in a structured manner to equip teachers with the technical skills and pedagogical knowledge required to integrate AI effectively into T&L. Such training should address not only technical aspects but also teaching strategies that enable AI to be used effectively to meet individual student needs. Second, the development of educational policies supporting the use of AI is essential to provide guidelines, infrastructure support, and adequate digital learning resources. These policies could also include evaluating the effectiveness of AI in the classroom and providing incentives for teachers who actively use it.

Furthermore, this study highlights the need for further research to assess the effectiveness of AI in improving teaching and learning quality, particularly in the context of Malaysian primary schools. Such research could focus on AI's impact on student achievement, motivation, engagement, and classroom management. With a deeper understanding of the relationship between teachers' perceptions, readiness, and the effectiveness of AI, schools and the Ministry of Education can plan more effective, realistic, and context-specific strategies for AI implementation at the grassroots level.

In conclusion, the use of AI in primary school teaching depends not only on the technology itself but also on teachers' attitudes, understanding, and training. With adequate professional development, supportive educational policies, and ongoing research to evaluate AI's effectiveness, its potential can be fully realised, improving teaching and learning quality and fostering teachers who are more confident and proactive in navigating the digital era of education.

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