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Artificial intelligence in Islamic religious education and high school teachers' perceptions of digital divides and prophetic ethics in Indonesia's global south

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Abstract

The integration of Artificial Intelligence (AI) in global education has indeed grown rapidly. Still, its application in the learning of Islamic Religious Education *(Pendidikan Agama Islam - PAI)* at the high school level, especially in areas that have just begun to develop technological initiatives, such as Demak, is still rarely explored. This qualitative research, using a phenomenological approach, aims to analyze in depth the perceptions of PAI teachers in public senior high school (*Sekolah Menengah Atas Negeri : SMAN*) throughout Demak Regency regarding the use of AI in teaching, using the Unified Theory of Acceptance and Use of Technology (UTAUT2) and Technological Pedagogical Content Knowledge (TPACK) frameworks. The findings of the study reveal three main themes: (1) AI as a Facilitator of Pedagogical Efficiency and Creativity, where teachers view AI as a tool that increases performance expectancy in the preparation of lesson plans and the enrichment of interactive learning resources; (2) Negotiation of Scientific Authority and Prophetic Ethics, which includes deep doubts about the accuracy of religious content produced by AI, because this AI does not have scientific censorship such as *sanad* and *matan* in hadith, as well as concerns about reducing the role of teachers as *uswatun hasanah*; (3) Structural Barriers in the Digital Ecosystem, especially infrastructure limitations (facilitating conditions) and digital competency gaps between generations of teachers. This study concludes that the integration of AI in PAI requires an approach that combines technological literacy, critical religious literacy, and strengthening the humanist role of teachers. These findings contribute to the development of AI integration models in value-based Islamic religious education in the context of the Global South and have implications for differentiated and sustainable teacher professional development policies.

1. Introduction

21st-century education cannot be separated from technology. Especially now, artificial intelligence (AI) has become a hot topic everywhere (Anang et al., 2025; Andriansyah, 2023; Triangga et al., 2026). Many learning platforms are starting to integrate AI that can personalize learning, automate administrative tasks, and provide rich pedagogical resources (Gouseti et al., 2025; Holmes et al., 2021). In various countries, this technology has begun to be used to increase the effectiveness of teaching and learning (Hosna et al., 2026). However, when we look at the existing literature (Natalia et al., 2026), most of it is still dominated by the context of general education, science, and mathematics. Meanwhile, research related to Islamic religious education is still scarce.

Even though Islamic Religious Education (PAI) is unique, not only about knowledge transfer, but also about internalizing values, character building, and most importantly, example. PAI teachers have a central position (Djazilan et al., 2024). In the Islamic tradition, the learning process emphasizes *manners* and personal relationships between teachers and students. Teachers are *uswatun hasanah*, good role models (Raquib et al., 2022). Thus, the presence of AI that can produce instant and interactive content makes us wonder whether this kind of technology is in line with the sacred purpose of Islamic religious education, or perhaps it will even distort the essence of teacher-led teaching.

Demak is an interesting area. In addition to being known as the center of the spread of Islam in Java through Walisongo, this area has also begun to show the dynamics of the development of educational technology. There is an AI training initiative in SMAN that shows that teachers there are starting to use applications such as *ChatGPT, MagicSchool, Canva AI,* or *Conker*. But the question is: how do PAI teachers interpret this use in the context of the subjects they teach? Do they see AI as a blessing that makes work easier? Or is it precisely as a threat that can erode their scientific authority? This theme is interesting because it has not been researched much.

Actually, there have been several studies on teachers' readiness to face AI in Indonesia. But those that specifically target PAI teachers and explore their lived experiences in the field are still rare. Muhtaram (2025) has tried to discuss the potential of AI in improving the digital competence of PAI teachers, but it is still limited to literature studies. Meanwhile, what is needed is empirical research like this.

So this study uses two theoretical frameworks at once: First, Venkatesh's Unified Theory of Acceptance and Use of Technology (UTAUT2) (Kittinger & Law, 2024; Venkatesh et al., 2016). This theory explains the factors that influence people in adopting technology: performance expectancy (the extent to which technology improves performance), effort expectancy (ease of use), social influence, facilitating conditions (supportive conditions), hedonic motivation (pleasure), and others. Suitable for analyzing teacher perception.

Second, Technological Pedagogical Content Knowledge (TPACK) from Mishra and Koehler (Mishra et al., 2023; Runge et al., 2025). This theory discusses how effective technology integration requires synergy between technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). In the context of PAI, this CK is very complex because it is not only the memorization of verses, but also the understanding of *sanad, matan,* interpretation methodology, and others. In addition, TPACK is also one of the priorities of the Ministry of Education in Indonesia, which is integrated into the learning curriculum and teacher quality improvement programs, such as teacher professional education.

So this study will answer three questions: 1) How do PAI teachers' perceptions of the benefits of AI in learning seen from the perspective of performance expectancy, effort expectancy, and hedonic motivation in UTAUT2; 2) why teachers feel worried and face challenges is analyzed through negotiations between kindergarten, PK, and CK in TPACK; 3) What factors affect their adaptation to AI from the facilitating conditions and social influence in UTAUT2.

2. Literature Review

AI in education has evolved from what was just simple *computer-assisted learning* to a sophisticated system that can be personalized and adaptive (Fitriyah et al., 2026). AI applications have penetrated into various disciplines, with a significant impact on student *engagement* and learning outcomes (Chen, 2026), has even integrated AI into their digital platforms, enabling teachers to access rich resources and automate administrative tasks *(Runge et al., 2025)*. But the problem is, the majority of these studies focus on STEM and have not penetrated into the humanities, especially since the number of Islamic

religious education is still small. In fact, religious education is not only a cognitive affair, but also affective and spiritual. Dimensions that are not so easily replicated by AI.

UTAUT2 has been widely used to understand the adoption of technology in education. Venkatesh (Venkatesh et al., 2012) showed that performance expectancy, effort expectancy, and facilitating conditions had a significant effect on behavioral intentions to use technology (Venkatesh et al., 2016). In schools, teachers are more likely to adopt technology if they feel it is useful to improve their teaching performance (performance expectancy) and if they have adequate institutional support (facilitating conditions). However, the application of UTAUT2 in the context of religious education is still limited, so this study tries to fill that gap.

TPACK (Dogan et al., 2025; Herring et al., 2016) provides us with a lens to understand the complexity of the knowledge teachers need to integrate technology effectively. In religious education, this content knowledge (CK) component is very important. Because it is not only facts, but also interpretive traditions, epistemological commitments, and value systems.

Hosna, through his research (Hosna et al., 2026), has tried to apply the TPACK concept to analyze the digital competence of PAI teachers in Indonesia. He found that although teachers have basic technological knowledge, they struggle to integrate technology with deep religious knowledge. The study builds on those findings by exploring how PAI teachers negotiate between the content of AI results and traditional Islamic epistemology.

In his book, Fullan (Fullan, 2025) explains that the leadership and cultural roles of principals and district leaders are essential to increase school capacity. A supportive culture and infrastructure are essential to sustaining reform. Furthermore, shallow and short training often fails; Meanwhile, deep and continuous learning related to cultural change is needed because it is more effective. For this reason, future trends and strategies for their successful change depend on shared meaning, moral goals, and reflective action. Change is a complex social process that requires humility, commitment, and sustained effort.

PAI in Indonesia does have unique challenges in the digital era (Chen, 2026). As a subject that aims to form a complete Muslim personality *(insan kamil),* PAI must be able to balance the transmission of traditional knowledge and engagement with contemporary reality. After the AI training in Demak, it shows that teachers are starting to be exposed to AI tools, but still need continuous support to integrate them meaningfully (Anwar et al., 2025).

The concept of uswatun hasanah is a central issue in Islamic pedagogy. Teachers are not only required to transfer knowledge, but also to internalize Islamic values in daily behavior. The fundamental question, then, is whether AI-generated content can support this role of exemplar? Or is it even at risk of reducing teaching to just the transmission of information?

The above review shows that there has been no research that specifically explores the perception of PAI teachers about AI integration using integrated theoretical frameworks (UTAUT2 and TPACK) in the

Indonesian context. This research is here to fill that gap by providing empirical evidence from Demak, Indonesia, an area with a strong Islamic historical heritage as well as a newly developed technological initiative.

3. Methodology

Research Design: Interpretive Phenomenology

This research uses a qualitative approach (Creswell & Creswell, 2023; Creswell, 2012) with a phenomenological approach (Moustakas, 1994; Polkinghorne, 1989). This design was chosen because we intend to research and interpret the meaning of the life experiences of PAI teachers in responding to the presence of AI. This approach is suitable for exploring in depth how participants interpret the phenomenon of teaching PAI using AI based on their subjective perceptions and experiences, while still acknowledging that the researcher's interpretation is also involved in the process of interpretation.

The principle of bracketing (epoche) is strictly applied through several steps: (1) the researcher writes a reflective journal before collecting data to identify personal assumptions about AI and PAI; (2) regular discussions with peers (peer debriefing) to test for potential bias; and (3) member checking to ensure that the researcher's interpretation is in accordance with the meaning intended by the participant.

Participants and Settings

The participants of this study are 12 PAI teachers who teach at high schools in Demak Regency, Central Java. The selection of participants was carried out purposively with strict inclusion criteria: namely PAI teachers who remain in high school with at least 5 years of teaching experience, have actively used AI, who are operationalized as: have participated in formal training on AI in education, or independently have used at least two AI-based applications (such as ChatGPT, Gemini, Canva AI, or MagicSchool) in the preparation or implementation of PAI learning in the last 6 months. Verification is carried out through initial interviews and brief demonstration requests, and the participant is willing to participate in in-depth interviews and member checking processes.

Background variations (age, gender, urban/rural school location, and length of use of AI) were also considered to gain a rich perspective. Table 1 shows the detailed profiles of the participants (see Table 1).

Table 1: Profile of Research Participants

Code	Age	Gender	Experience	School Location	Formal AI Training	AI Applications Used	Frequency
G01	47	Male	22 years old	Urban	Yes	ChatGPT, CanvaAI	Weekly
G02	32	Women	8 years	Urban	Yes	ChatGPT, Gemini, CanvaAI, Deepseek	Almost every day
G03	55	L	28 years old	Suburban Areas	No.	ChatGPT (kadang-kadang)	Every month
G04	40	P	15 years	Urban	Yes	CanvaAI, Conker	Weekly
G05	38	L	12 years	Coastal	Yes	ChatGPT, MagicSchool	2-3x/Week
G06	58	L	32 years old	Urban	Yes	ChatGPT (1-2x)	Rare
G07	44	P	18 years old	Countryside	No.	Belum pernah	Never
G08	51	L	25 years	Urban	Yes	ChatGPT, CanvaAI	Weekly
G09	36	P	10 years	Countryside	No.	ChatGPT (kadang-kadang)	Every Month
G10	29	L	5 years	Urban	Yes	ChatGPT, Gemini, Canva AI	Almost every day
G11	53	P	26 years old	Countryside	No	Belum pernah	Never
G12	42	L	17 years	Urban	Yes	ChatGPT, MagicSchool	2-3x/week

Note: Participants' names are anonymized for confidentiality. Frequency based on participant recognition.

The number of participants (12 people) is determined based on the principle of data saturation, which is the point at which the collection of additional data no longer provides new information or themes. Saturation was achieved after the 3rd interview, and two additional interviews were conducted for confirmation.

Data Collection Techniques

Data were collected through in-depth semi-structured interviews. The interview guidelines were developed based on the UTAUT2 and TPACK frameworks, as well as a literature review, which covers topics including: Understanding of AI and the experience of using AI tools (capturing kindergarten data), Perception of the benefits of AI in PAI learning (capturing performance expectancy and hedonic motivation), Perception of the ease of using AI (capturing effort expectancy), Experience using AI to search for PAI materials, creating media, or compiling evaluations (netting the integration of kindergarten-PK-CK), Concerns about the accuracy of religious content and the role of teachers (netting the negotiation of scientific authorities), Infrastructure barriers and environmental support (netting facilitating conditions and social influence).

Each interview lasts between 30 and 45 minutes, is recorded with the participant's permission, and then transcribed verbatim. In addition to interviews, informal observations of the school environment and documentation (e.g., examples of lesson plans or media made by teachers) are also used as triangulation data.

Data Analysis

Data were analyzed using interpretive thematic analysis methods. The analysis process includes six stages: Reading and rereading: The researcher reads all transcripts over and over again to gain a holistic and in-depth understanding of each participant's experience, Initial notes: The researcher makes exploratory notes in the transcript, including descriptive comments (what the participants said), linguistic comments (how they say them), and conceptual comments (interpretive meaning), Developing the emergent theme: The initial notes are organized into themes that represent the essence of the participant's experience, Seeking connections between themes: The themes of each participant are connected and grouped into larger clusters, Moving on to the next participant: Processes 1-4 are repeated for each participant individually, Searching for patterns between participants: The themes of all participants are synthesized to identify superordinate themes that represent the collective experience.

To ensure the validity of the data (trustworthiness), it was carried out: Triangulation of sources: to compare interview data with observations and documents, Member checking: Reconfirm the researcher's interpretation to five participants (G01, G02, G05, G08, G12) to ensure the accuracy of the interpretation, Peer debriefing: Discuss findings with two fellow researchers who are experts in the field of educational technology and religious education, Audit trail: Systematically document the entire research process, including methodological decisions and interpretation developments.

Coding Map

To be more transparent, here's a coding map (see table 2) showing how raw data is categorized into themes.

Table 2: Coding Maps

Raw Data	Initial code	Sub-theme	Main Theme
"It used to take at least half a day to make a lesson plan; now the draft is ready in minutes" (G01)	Time efficiency	Ease of administration	AI as a facilitator of pedagogical efficiency and creativity
"AI gives me visual capital that I didn't think of before" (G02)	Inspiration of the time	Teaching media innovation	
"I became more enthusiastic about making teaching materials because of the many choices" (G10)	Motivation to rise	Hedonic motivation	
"I tried to ask the AI to create *asbabun nuzul* material, but its accuracy is doubtful" (G03)	Doubts of validity	The dilemma of content accuracy	Negotiation of scientific authority and prophetic ethics
“AI tidak memiliki sensor keilmuan tafsir, guru harus kritis” (G03)	Scientific filter		
"Students need to see examples from teachers directly, not just knowledge from AI" (G04)	Role model	Reduction of the role of humanists	
"PAI needs a spiritual and ethical touch, AI can't provide that" (G04)	Spirituality		
"The signal here is unstable; it's hard to open the app" (G05)	Limited access	Infrastructure barriers	Structural barriers in the digital ecosystem
"Limited lab computers, more frequent use of personal cellphones" (G05)	Limited devices		
"Training feels too fast, I need intensive mentoring" (G06)	Need assistance	Competency gap	
"Young teachers understand better; we seniors are left behind" (G06)	Generation gap		

4. Research Results

From the analysis of interview data with 12 teachers of Islamic Religious Education at State High Schools in Demak, three main themes emerged that represented their perception of the use of AI in teaching. The themes were analyzed using UTAUT2 and TPACK glasses. The three themes are: (1) AI as a Facilitator of Pedagogical Efficiency and Creativity, (2) Negotiation of Scientific Authority and Prophetic Ethics, and (3) Structural Barriers in the Digital Ecosystem.

4.1. AI as a Facilitator of Pedagogical Efficiency and Creativity

This first theme illustrates teachers' positive perceptions of AI, especially in the construct *of performance expectancy* (performance improvement) and hedonic motivation (pleasure of use) in UTAUT2. The majority of participants who actively use AI (G01, G02, G04, G05, G08, G10, G12) felt that there was a significant increase in work efficiency and pedagogical creativity.

Ease of Administration

Teachers feel that the administrative tasks that have been time-consuming have become lighter with the help of AI. Participant G01, a senior teacher with 22 years of experience, revealed how AI is changing her routine:

"In the past, if you wanted to make a lesson plan, it could take half a day, you had to look at books many times, and even the internet. Sometimes I just think about the format until night, the suitability of the indicators, and looking for the right material. Now, with AI like ChatGPT or tools in Canva, I can get drafts in minutes. I only asked "make a class X PAI lesson plan chapter on zakat material with the PBL model", immediately came out. Of course, it cannot be used immediately; I have to adjust it to the context of the PAI material and the character of the students here. But it helped a lot, my time became more and more to think about how to deliver it, what methods would work, or even rest. Very efficient." (Interview, G01, 2025)

This quote shows that AI is perceived as a tool that significantly increases *performance expectancy*, helping teachers to complete tasks faster and better. Interestingly, G01 argues that AI results still need to be adjusted. This shows that he is not completely dependent on technology, but uses AI as a tool, not a substitute for his professional judgment.

Teaching Media Innovation and Teaching Motivation

In addition to efficiency, AI is also perceived as a source of inspiration to create more varied and interactive learning media. Some young teachers claim to use generative AI to create images or short videos that are relevant to the stories of the prophets or illustrations of *kauniyah* verses. G02, who uses AI almost every day, says:

In addition to efficiency, AI is also perceived as a source of inspiration to create more varied and interactive learning media. Some young teachers claim to use generative AI to create images or short videos that are relevant to the stories of the prophets or illustrations of kauniyah verses. G02, who uses AI almost every day, says:

G02 also highlights the *hedonic motivation* aspect of AI that makes work more enjoyable:

"Honestly, I am more enthusiastic about making teaching materials now. I used to feel that it was hard to be assigned to create media. Now I'm even curious. Finally, I tried. What else can this AI make, huh? It's like having a discussion buddy who is always ready to help me 24 hours a day." (Interview, G02)

The same thing was also expressed by G10, the youngest teacher in the study:

"For millennial teachers like me, AI is a mandatory tool. Not only for efficiency, but it can also be used to explore ideas. I often ask AI to provide contemporary analogies of abstract PAI concepts. For example, to explain the concept of destiny, I asked the AI to make an analogy about an algorithm. The results are sometimes beyond expectations, but that's what makes it even more exciting." (Interview, G10)

These findings show that AI not only improves the technical aspects of teaching but also impacts teachers' affective dimensions, motivation, enthusiasm, and enjoyment of work. This is important because teacher motivation is one of the key factors in the success of technology adoption in the long term.

4.2. Negotiation of Scientific Authority and Prophetic Ethics

Behind the positive perception of efficiency, there are also deep concerns regarding substantial and ethical aspects. This theme describes the complex negotiation between technological knowledge (TK), religious content knowledge (CK), and pedagogical knowledge (PK) within the framework of TPACK. The main concern is the accuracy of AI-generated religious content and the potential reduction of the humanist role of teachers.

The Dilemma of Religious Content Accuracy

PAI teachers realize that AI is trained from data on the internet, which is not all valid according to the correct Islamic perspective (according to the *mu'tabar* interpretation). This makes teachers very careful, especially senior teachers who have a deep understanding of the epistemology of Islamic science. G03, a teacher with 28 years of experience, stated emphatically:

"I tried to ask AI to make material about the asbabun nuzul surat Al-Lahab. I gave you a simple prompt. The results are indeed good, neat, and structured. But I couldn't believe it right away. I checked, why is there a history that I memorized that is not mentioned, in fact there are additional stories that I myself doubt the truth. In the science of interpretation, there are many histories that must be studied in sanad and matan. Is the narrator reliable? Is the hadith not contrary to the Qur'an? It requires deep knowledge. AI does not have that scientific sensor. AI only summarizes from various sources on the internet, without being able to distinguish between what is authentic and what is dha'if. I am afraid that when junior teachers or those who are not strong in knowledge or are not critical, they may even be misunderstood and teach students. It's becoming dangerous." (Interview, G03)

These concerns reflect PAI teachers' deep understanding of the epistemology of Islamic science that relies on the validity of sources *(sanad)* and strict interpretation methodologies. In the TPACK framework, it shows that the integration of kindergarten (AI) with CK (religious knowledge) cannot be done simply, in the sense that it requires critical capabilities to verify and filter the output generated by AI.

G04 adds perspective on the need for scientific filters:

"I see this AI as a knife. It can be used for good, but it can also be used for harm. In the context of PAI, if we don't have the filter, we can be consumed by wrong information. I always advise young teachers to never take it raw from AI. It must first be checked against the primary sources such as the Qur'an, mu'tabar tafsir, and hadith books. AI is a tool, not a scientific authority. Scientific authority remains in scholars and teachers who have scientific sanad." (Interview, G04)

Reducing the Humanist Role of Teachers as Uswatun Hasanah

This concern does not only stop at the accuracy part, but also comes down to the role of the teacher as a religious authority holder and moral guide. There are fears that reliance on AI could reduce the central role of PAI teachers, who are supposed to be direct role models. G04 continues:

"I am worried that if teachers are too busy with AI, direct interaction with students will be reduced. Even though PAI is not just a matter of memorizing verses or history. But it is also more about the question of moral formation. Students need to see firsthand how the teacher behaves, how he speaks politely, and how he applies his knowledge in daily life. AI can indeed provide very complete information about honesty, for example, but it cannot give a spiritual touch when students come to convey their problems. AI also cannot provide a direct example of how to be patient, how to forgive. Don't let us get too busy with technology, but forget that the essence of PAI is direct guidance, transferring value, and also example. Teachers are uswatun hasanah, good examples, and they will not be replaced by AI." (Interview, G04)

G01 reinforces this sentiment with a more reflective perspective:

"I had thought, maybe with this AI, the role of teachers will be reduced? But after I pondered it, it was the opposite. AI challenges us to become better teachers and be willing to continue learning and growing. We used to be able to teach in the same way for many years. Now, with AI, students can get information faster than we do. Our job is no longer just to provide information, but to guide them to filter information, criticize, and most importantly, instill values. Our role shifts from being the original source of information to the guide of meaning. And that's precisely a higher, more human role." (Interview, G01)

G01's statement shows that there is a process of negotiation and in-depth reflection on the role of teachers in the AI era. He does not see AI as a threat, but as a catalyst that can drive the transformation of the role of teachers to an even higher level, from a transmitter of knowledge to a facilitator of meaning and an ethical guide. This is an important finding that shows the pedagogical maturity of PAI teachers in Demak Regency.

4.3. Structural Barriers in the Digital Ecosystem

The third theme reveals significant structural barriers, which, within the framework of UTAUT2, can be categorized as inadequate *facilitating conditions*. Not all schools in Demak Regency have adequate digital infrastructure, and the competency gap between teachers is also a serious challenge.

Infrastructure Limitations: Internet and Device Access

Limited internet access in some areas and the availability of supporting devices in schools are the main obstacles. G05, a teacher from a school in a suburban district, complained:

"The enthusiasm to try AI is indeed high. I have participated in training at MGMP and am very interested. But here at our school, the signal is unstable. Sometimes 4G suddenly drops to E. It's difficult to open the application, especially if you have to upload images or videos. In schools, laboratory computers are also limited. The specifications are also old. So, like it or not, I use AI more at home for preparation, using my personal cellphone and my own data package. However, I can't go directly to class with students because I'm afraid of technical problems." (Interview, G05)

G07, who has never used AI, added:

"I heard about AI, but the signal here is difficult. To open WhatsApp alone sometimes takes a long time. So yes, I teach in the usual way, the important thing is that students understand. Maybe later, when the infrastructure is good, I want to learn." (Interview, G07)

This quote shows that despite the *willingness*, the absence of *adequate facilitating conditions*, in this case, digital infrastructure, is a major obstacle to AI adoption. This is in line with UTAUT2's prediction that *facilitating conditions* have a significant effect on the use of technology.

Digital Competency Gap Between Generations

In addition to infrastructure, the digital competency gap between teachers is also a challenge. More senior teachers generally feel less confident about exploring AI, even if they have deep CK (content knowledge). G06 honestly confessed:

"AI training from the Subject Teacher Meeting is good. I went along. But for older teachers like me, the material sometimes feels too fast. The English is difficult; The technical terms also confuse me. They convey about prompts, generate, and machine learning. I nodded, but was dizzy. We need more intensive mentoring, not just theory in class for a day or two, but hands-on practice as much as possible, perhaps with a tutor who is patient and can guide step by step. If not, yes, I have gone back to the old way, which is to use textbooks and lectures. Instead of being wrong, it's better not to do it." (Interview, G06)

G03 also voiced a similar point, highlighting the need for a different approach for senior teachers:

"I see that young people are indeed very quick learners. They are used to using gadgets. Meanwhile, we who are old must learn slowly, and with analogies that we understand. Training should be differentiated; there are classes for those who are already proficient, and there are classes that are specifically for beginners like us. And most importantly, there are also people to ask when we forget or get confused after the training is over." (Interview, G03)

Young teachers such as G10, on the other hand, acknowledge the existence of this gap and offer perspectives on potential collaboration:

"It is true that there is a gap between senior and junior teachers. But I see that this can be used as a strength when managed properly. We young people have advantages in the realm of technology, but the senior ones actually have an extraordinary depth of religious knowledge. I often ask senior teachers for corrections when getting material from AI. He can show which ones are still not right, which are still wrong from a scientific perspective. This kind of collaboration is ideal: I help with the technicalities, he helps with the substance." (Interview, G10)

These findings reiterate that AI adoption is not only a matter of individual willpower, but also highly determined by the availability of infrastructure and the effectiveness of inclusive and differentiated teacher capacity building programs. The generation gap is not a problem that must be eliminated, but it can be leveraged as a resource to be managed through collaboration among teachers.

Summary of Findings in Theoretical Framework

Table 3 shows a summary of the findings mapped into the UTAUT2 and TPACK frameworks (see Table 3).

Table 3
Mapping Findings into UTAUT2 and TPACK

Main Theme	Sub-theme	UTAUT2 Construct	Domain TPACK
AI as a facilitator of efficiency and creativity	Ease of administration	Performance expectancy (+)	TK-PK
	Teaching media innovation	Performance expectancy (+)	TK-CK
	Increased motivation	Hedonic motivation (+)	TK
Negotiation of scientific authority and prophetic ethics	The dilemma of content accuracy	Effort expectancy (-)	TK-CK
	Scientific filter	-	CK
	Reduction of the role of humanists	-	PK-CK
	Spirituality	-	CK-PK
Structural Barriers	Infrastructure limitations	Facilitating conditions (-)	TK
	Device limitations	Facilitating conditions (-)	TK
	Need assistance	-	TK-PK
	Generation gap	Social influence (=/-)	TK-CK

5. Discussion

5.1. AI as a Driver of Performance Expectancy and Transformation of Teacher Roles

The first findings about AI as a facilitator of pedagogical efficiency (Andriansyah, 2023) and creativity are in line with UTAUT2's prediction that performance expectancy (perception of the benefits of technology to improve performance) is the strongest predictor of behavioral intention to use technology (Venkatesh et al., 2016). Teachers in Demak have consistently shown that AI helps them in completing administrative tasks faster (RPP, teaching materials) and producing more creative learning media (Khimmataliev et al., 2025). This also confirms the findings of previous studies on the potential of AI to ease the administrative burden on teachers and provide rich pedagogical resources (Runge et al., 2025).

What is more interesting is the emergence of the dimension of hedonic motivation or pleasure in using AI. G02 and G10 explicitly mention that AI makes them more excited and curious. In the UTAUT2 literature, hedonic motivation has indeed been shown to have a significant effect on technology adoption, especially in the context of consumers and individual users. These findings extend the application of UTAUT2 into the context of Islamic religious education, showing that affective aspects (pleasure) also play an important role in encouraging teachers to adopt AI, not just functional aspects.

But the deeper finding is that these teachers are not simply passive consumers of AI. G01 expressly states that AI results should not be used immediately; they should be customized. This shows that there is an active negotiation process between teachers and technology (Supriyadi et al., 2025). Within the framework of TPACK, this reflects a mature integration between kindergarten (knowledge about using AI) and PK (pedagogical knowledge of student characteristics and learning objectives). The teacher does not lose their professional agency; instead, they use AI as a tool that can reinforce, not replace, their pedagogical considerations.

5.2. Epistemological Negotiations: Tensions between kindergarten and CK in PAI

The most significant findings of the study are about the negotiation of scientific authority, a dimension rarely discussed in the educational technology adoption literature. Teachers' concerns about the accuracy of AI-generated religious content reflect their deep understanding of the epistemology of Islamic science.

In the Islamic scientific tradition, the validity of knowledge is highly dependent on a reliable sanad or chain of narration and strict interpretation methodologies (such as in the science of *tafsir*, *hadith*, and *ushul fiqh*). AI, with its probability algorithms, works with different logics. AI generates text based on statistical patterns from billions of documents on the internet, without the ability to distinguish which sources are authentic and which are *dha'if*, let alone which are maudhu'. The tension between these two

epistemological systems, namely sanad-based Islamic epistemology and probability-based AI epistemology, is at the core of the dilemma faced by PAI teachers.

These findings enrich the TPACK literature by showing that the integration of kindergarten and CK in the context of Islamic religious education cannot be done neutrally. It requires an additional component that may be called Critical Religious Technological Literacy (Supriyadi et al., 2025), that is, the ability to critically evaluate technological outputs from an authoritative religious perspective. G03 and G04 explicitly state the need for scientific filters and scientific authority that cannot be replaced by AI.

These concerns are in line with the global discourse on AI and ethics. Studies in the context of other religions, for example, in Christian education (Salim et al., 2026), also encounter similar concerns about the accuracy of the interpretation of sacred texts by AI. Tapi konteks Islam dengan tradisi sanad yang kuat memberikan nuansa yang lebih kompleks. This suggests that the adoption of AI in religious education requires a more careful and contextual approach compared to general subjects. AI training programs for PAI teachers should explicitly address this issue, engaging commentators and hadith experts to guide how to verify religious content generated by AI.

The Reduction of the Role of Humanists: AI, Uswatun Hasanah, and the Future of Prophetic Pedagogy

Concerns about the reduction of the humanist role of PAI teachers touch the core of Islamic pedagogy. In the Islamic tradition, teachers are not only conveyors of information, but also *murabbi* (educators of the soul), *mu'allim* (teachers of knowledge), and *mu'addib* (shapers of manners) (Aedi & Gorni, 2025). This role cannot be reduced to mere transmission of knowledge, as it involves spiritual and emotional dimensions that require physical presence and personal interaction.

G04 makes it very clear that AI cannot provide a spiritual touch and direct example. This is an important criticism of the discourse on educational technologization that often focuses too much on the cognitive aspect and ignores the affective and spiritual aspects. In an Islamic perspective, learning is a holistic process that involves the soul and body, not just the brain.

But what is interesting is G01's response that sees AI as a challenge to get teachers back to their essential roles. He argued that with AI, the role of teachers shifts from a source of information to a guide of meaning. It's an optimistic and transformative view (Anang et al., 2025). AI, with its ability to provide information instantly, actually frees teachers from mechanical tasks and allows them to focus on higher things: guiding students to interpret information, inculcate values, and form character.

This perspective is in line with the idea of critical pedagogy in the digital age, where teachers play the role of facilitators of critical awareness, not just transmitters of knowledge (Aedi & Gorni, 2025; Anang et al., 2025; Andriansyah, 2023). In the Islamic context, this can be referred to as prophetic pedagogy, an education that not only transfers knowledge, but also forms a person who is divinely aware and committed to prophetic values (honesty, justice, compassion). AI, in this framework, can be a tool that

strengthens prophetic pedagogy, as long as it is used with critical awareness and remains centered on the humanist role of teachers.

5.3. Structural Barriers in the Global South: Lessons from Demak

The findings on infrastructure limitations and digital competency gaps place this study in a broader context, namely the challenges of technology adoption in the developing world (Global South). The conditions experienced by G05, namely unstable signals and limited devices, illustrate the reality faced by many teachers in the suburbs of Indonesia and other developing countries.

Within the framework of UTAUT2, inadequate facilitating conditions proved to be a significant inhibitor, even when performance expectancy and hedonic motivation were high. This shows that AI adoption cannot rely solely on individual willpower or training, but requires serious infrastructure investment from governments. The global AI for Development (AI4D) movement is increasingly aware that the digital divide can widen the educational gap between developed and disadvantaged regions (Anang et al., 2025). The study provides empirical evidence from the field on how these gaps manifest in teachers' daily lives.

In addition to physical infrastructure, the findings on the competency gap between generations of teachers highlight the need for a more inclusive and differentiated approach to professional development (Adiyono et al., 2025). One-size-fits-all or uniform training is proving to be ineffective, especially for senior teachers who may have higher technology anxiety. A continuous mentoring program with a peer-to-peer model, in which young teachers accompany senior teachers (as suggested by the G10), is the most potential solution. This model not only transfers technical skills but also builds social bridges and rewards between generations. Finally, young teachers learn the depth of religious knowledge from seniors; Senior teachers learn digital skills from juniors.

6. Conclusion

This phenomenological qualitative study analyzes in depth the perception of Islamic Religious Education teachers of State High Schools in Demak Regency about the use of AI in teaching, using the UTAUT2 and TPACK frameworks. Three main themes were successfully identified: First, AI is a facilitator of pedagogical efficiency and creativity. Teachers view AI positively as a tool that contributes to increasing performance expectancy (administrative efficiency and creativity of teaching media) and hedonic motivation (pleasure and motivation at work). But teachers still maintain their professional agency by not accepting the output of AI raw, but adapting it to the pedagogical context. Second, Negotiation of Scientific Authority and Prophetic Ethics. Behind the positive perception, there are deep concerns about the accuracy of AI-generated religious content, reflecting the tension between *sanad*-based Islamic epistemology and probability-based AI epistemology. Teachers are also worried about the potential reduction of their humanist role as *uswatun hasanah*. But some teachers see AI as a challenge to restore the essential role of teachers as guides of meaning, not just conveyors of information. Third, structural

barriers in the digital ecosystem. AI adoption is hampered by inadequate facilitating conditions, especially the limitations of internet infrastructure and devices in suburban areas, as well as the digital competency gap between generations of teachers. Senior teachers need a differentiated approach to training and ongoing mentoring, not just one-time training.

This research makes theoretical contributions in the form of: extending the application of UTAUT2 into the context of religious education in the Global South, enriching the TPACK literature by identifying specific tensions between kindergarten and CK in religious education, as well as proposing the need for Critical Religious Technological Literacy, as well as providing empirical evidence on the dynamics of AI adoption in areas with developing technology initiatives (Demak), which is relevant to the discourse of AI for Development. In practical terms, this study offers specific and actionable policy recommendations for stakeholders at the local (Education Office, Subject Teacher Conference, schools) and national (Ministry of Religion, Ministry of Education) levels.

This study has several limitations that need to be acknowledged, namely: Generalizability: The small sample size (12 teachers) and the focus on one district (Demak) limit the generalization of the findings to a broader context. The next research can expand the geographical coverage to other districts/cities in Central Java or Indonesia with different characteristics. Methods: This study only relies on teachers' perceptions through interviews, not directly observing their teaching practices in the classroom. Ethnographic research or in-depth case studies in some schools would be invaluable to see firsthand how teachers integrate AI in their daily pedagogical practices. Student Perspectives: This study only involves the teacher's perspective. Further research can involve students' perceptions of Islamic Religious Education learning involving AI.

The integration of AI in Islamic Religious Education is not only a technical issue, but also a complex pedagogical, epistemological, ethical, and theological issue. This study in Demak shows that Islamic Religious Education teachers welcome AI with enthusiasm as well as vigilance. They see its great potential to increase efficiency and creativity, but are also aware of the risks to the accuracy of the teachings and the essence of their role as educators. The synergy between technological innovation and traditional pedagogical wisdom, or between algorithms and *sanad*, between speed and depth, between information and exemplarity, is the key to realizing a meaningful digital transformation in Islamic religious education. Islamic Religious Education teachers in Demak, with all their limitations, have started this journey with careful and hopeful steps.

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Data Availability Supporting data on the findings in this study are available from the corresponding author on reasonable request.

Human Ethics and Consent to Participate declarations: The research methods and procedures in this article all adhered to applicable ethical standards. The research team guaranteed the confidentiality of participants' identities and secured the data in a password-protected encrypted file. The team conducted the research in accordance with internationally recognized ethical guidelines and regulations for research involving human participants. Ethics approval was granted by the Institute for Research and Community Service, Walisongo State Islamic University, Semarang solely based on the signature of the chairperson (Number: 1453/Un.10.0/L.1/PP.03.06/06/2026). As part of a comprehensive process, the corresponding author led and supervised the entire research team regarding the integrity and regulations of the research. The team ensured that informed consent was obtained from all participants and/or their guardians after the purpose of the research, data handling, and confidentiality protocols were explained prior to participation, as they participated voluntarily and were informed of their freedom to withdraw at any time without negative consequences.

Consent for publication: All participants gave their statements voluntarily and consciously. Before participating, all individuals were given information about the purpose of the study, the procedures to be followed, and their right to withdraw from the study at any time without penalty. All data collected during the survey was kept confidential, used solely for analytical purposes, and stored securely to prevent misuse of information.

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