AI-Driven Teaching Efficiency in Islamic Education: Conceptualizing Modern Pedagogy and Teacher Development

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Abstract

This paper conceptualizes how artificial intelligence (AI) can raise teaching efficiency in Islamic education without displacing the teacher's pedagogical and moral authority. It uses a literature-based conceptual analysis of 15 sources published between 2021 and 2026, covering AI in teaching, teacher competence frameworks, and AI in Islamic religious education. The analysis shows three patterns. First, measurable efficiency gains are concentrated in planning, assessment, and material development, and they are only realized when teachers redesign their tasks rather than automate old ones. Second, existing studies in Islamic education mostly list benefits and risks, and they rarely define efficiency or connect it to teacher development. Third, teacher competence frameworks address technology, pedagogy, and ethics, but they do not yet address the verification of religious knowledge and the continuity of transmission (sanad). The paper proposes a four-component framework: efficiency domains, pedagogical reinvestment, teacher competence, and a values anchor. Four propositions follow from it. The framework redefines efficiency in Islamic education as time that is released by AI and reinvested in mentoring, dialogue, and talaqqi. It offers a basis for empirical testing and for teacher development programs.

Keywords: artificial intelligence, teaching efficiency, Islamic education, modern pedagogy, teacher development, Intelligent-TPACK

Introduction

Teaching efficiency has moved from a managerial concern to an evidence-based question. In a school-randomised trial of 259 science teachers in 68 English schools, teachers who used ChatGPT for lesson preparation spent about 56.2 minutes per week on planning, compared with 81.5 minutes in the comparison group, a saving of 25.3 minutes, and an expert panel found no difference in the quality of the resources (Roy et al., 2024). The same trial shows that the saving came from modest use, mostly for quizzes and activity ideas, not from full lesson automation. Efficiency, in other words, depends on how teachers use the tool.

Islamic education faces the same shift, with added constraints. A mixed-methods study of Islamic Studies students found that most of them use AI tools, particularly ChatGPT at 58.64%, and the respondents asked for ethical guidelines grounded in Islamic values (Nordin et al., 2025). Interviews with Islamic religious education (PAI) teachers show that they accept AI for administrative work but reject it as a substitute for talaqqi, the face-to-face transmission of the Qur'an, and they insist on the supremacy of sanad (Zulfikar et al., 2026). Teacher

preparation lags behind this use. UNESCO reported that few countries have defined AI competencies for teachers or built national training programs, and that by 2022 only seven countries had a framework or professional development program for teachers (Miao & Cukurova, 2024).

These developments sit within a wider body of research on artificial intelligence in education. Reviews of the field describe applications in administration, instruction, and learning (Chen et al., 2020; Hwang et al., 2020), and a systematic review of higher education research asked where the educators are, reporting weak links to pedagogical theory and little critical reflection on the challenges and risks of AI (Zawacki-Richter et al., 2019). Ouyang and Jiao (2021) distinguish three paradigms, in which AI directs the learner, supports the learner, or empowers the learner, and the paradigms differ in how much agency they leave to the human actors. Which paradigm applies to a teacher's own work, and who decides how saved time is used, are questions that the efficiency literature seldom asks. They carry more weight in a tradition in which the teacher is also a moral exemplar and a link in a chain of transmission.

The literature on AI in Islamic education has grown quickly, but it is dominated by reviews that list benefits such as adaptive learning, interactive media, and automated assessment, and risks such as ethical issues, data privacy, and overreliance (Luqmi et al., 2024; Zainadun et al., 2025). These reviews do not define teaching efficiency, they do not separate task-level gains from pedagogical gains, and they treat teacher development as a closing recommendation rather than as a component of the model. Work on teacher knowledge, such as Intelligent-TPACK, is developed in general education and does not address the verification of religious knowledge (Celik, 2023; Mishra et al., 2023).

This paper addresses that gap through three objectives. The first is to define teaching efficiency in a way that fits Islamic education. The second is to identify which modern pedagogical practices AI can support and which it must not replace. The third is to specify the competencies that teacher development should build. The contribution is a conceptual framework with four propositions that can be tested empirically.

Research Questions

The three objectives are stated as three research questions.

RQ1. How can teaching efficiency be defined for Islamic education in a way that accounts for what teachers do with the time that AI releases?

RQ2. Which modern pedagogical practices can AI support in Islamic education, and which practices should remain with the teacher?

RQ3. Which competencies should teacher development programs build so that AI use stays accurate, ethical, and consistent with the transmission of religious knowledge?

The answers are built from the literature and are framed as a framework and four propositions, not as empirical findings.

Contribution and Organization of the Paper

The paper contributes in three ways. It offers a definition of teaching efficiency that counts reinvestment and the accuracy of religious content, not only time saved. It combines four components that are usually treated separately, namely efficiency domains, pedagogical reinvestment, teacher competence, and a values anchor. It also states four propositions together with indicators that later studies can use. The remaining sections review the literature, describe the method, present the framework and the propositions, discuss them in light of prior work, and close with limitations and directions for research.

Literature Review

Efficiency, effectiveness, and productivity

The word efficiency is used loosely in education research, so a working distinction is useful. In its simplest sense, efficiency compares what is obtained with what is spent, and in teaching the main scarce resource is teacher time. Effectiveness concerns whether learning goals are reached, and productivity relates outputs to inputs across a system. A teacher can become more efficient at preparing materials without any change in effectiveness, and an effective method can be inefficient. The English trial discussed below illustrates the first case, because the findings cited in this paper concern planning time and the quality of resources judged by experts, not learner outcomes (Roy et al., 2024).

This gap matters for the definition proposed later. If time saved is the only measure, a school could count a gain when teachers simply finish work earlier. Keppler et al. (2024) show that the way teachers choose tasks changes how much of the potential gain is captured, which points to the task, not the tool, as the unit of analysis. Cognitive load theory offers a second reason for care. Working memory is limited (Sweller, 1988), and a tool that removes routine demands may free capacity for the complex judgments of teaching, but only if the teacher's attention is redirected to them. These ideas lead to a view of efficiency as a relation among released time, the use made of that time, and the quality of what is taught.

AI and teaching efficiency

Holmes and Tuomi (2022) review AI systems in education and show that expectations often rest on a misreading of what the technology can do and on narrow views of what education is for. Their typology separates systems that serve learners, teachers, and institutions, which matters here because efficiency claims differ across these roles. A review of reviews of AI in higher education, covering secondary studies from several databases, found that adaptive systems and personalisation dominate the field and called for more attention to ethics, collaboration, and rigour (Bond et al., 2024).

For teachers, the most concrete evidence concerns planning time. The English trial cited above reports a 31% reduction in planning time without a measurable loss of quality (Roy et al., 2024). A study that models teacher task selection adds a caution: teachers who use generative AI only to complete tasks they already did leave most of the potential gain unrealized, while teachers who use it to decide which tasks to do capture more (Keppler et al., 2024). Efficiency is therefore a property of the redesigned task, not of the tool. Kasneci et al. (2023) reach a compatible conclusion from the side of competence, arguing that large language models require teachers and learners to build competencies and literacies that cover both the use and the limits of such systems.

Paradigms of AI in education and the position of the teacher

Ouyang and Jiao (2021) describe three paradigms. In the first, AI is directive and the learner is a recipient. In the second, AI supports the learner, who acts as a collaborator. In the third, AI empowers the learner, who leads the process. The same logic can be applied to teachers. A teacher who accepts AI output without review is in the position of a recipient, a teacher who uses it as a drafting partner is a collaborator, and a teacher who sets goals, criteria, and limits before using it is a leader. The framework in this paper assumes the third position as the target, since religious content requires a person who is accountable for its accuracy.

Hwang et al. (2020) discuss the vision, challenges, roles, and research issues of AI in education, and Chen et al. (2020) review applications in administration, instruction, and

learning. Williamson and Eynon (2020) place current enthusiasm in a longer history and draw attention to the interests and assumptions that shape it. Taken together, these works suggest that AI in education is a set of tools whose educational meaning depends on design and governance. A framework for Islamic education therefore has to state what is to be preserved as well as what is to be gained.

Modern pedagogy in Islamic education

Studies of AI in Islamic religious education converge on a set of applications. A systematic review of 39 empirical studies on Qur'anic pedagogy identifies automated assessment and recitation support, interactive teaching materials, monitoring of student progress, simulation tools for teacher training, and collaboration among teachers, and it lists accuracy, limited treatment of spiritual and moral values, and teacher overreliance as the main challenges (Zainadun et al., 2025). A review of 14 articles on PAI learning reports adaptive learning, interactive media, and automatic assessment as benefits, and ethical issues, data privacy, and information security as challenges (Luqmi et al., 2024).

The pedagogical question is what the teacher does once these functions are automated. A library study of PAI teachers in the generative AI era describes a repositioning of the teacher as learning facilitator, knowledge curator, digital ethics guide, and mentor of character and spirituality, and argues that moral exemplification and spiritual guidance cannot be replicated by AI systems (Azizah et al., 2026). Field evidence supports the same boundary. Teachers in a phenomenological study treat AI as an instrument for administrative tasks and reject it as a replacement for talaqqi (Zulfikar et al., 2026), and Islamic Studies students link AI use to the integrity of sanad and the authenticity of knowledge (Nordin et al., 2025). Modern pedagogy in Islamic education, as used in this paper, therefore means learner-centred and technology-supported practice that keeps the teacher as the guarantor of knowledge and character.

The teacher in Islamic educational thought

Writing on Islamic education has long treated the teacher as more than a conveyor of content. Sahin (2018) discusses critical issues in Islamic education studies and the tension between Islamic and Western liberal secular values of education, which suggests that questions about technology cannot be separated from questions about the purpose of education. In the tradition of Qur'anic and religious learning, knowledge is received from a teacher, and the chain of transmission (sanad) and face-to-face reception (talaqqi) give that knowledge its authority. The Islamic education studies reviewed in this paper reflect this view. PAI teachers accept AI for administrative work but not as a replacement for talaqqi (Zulfikar et al., 2026), students link AI use to the integrity of sanad (Nordin et al., 2025), and the repositioning of the teacher as digital ethics guide and mentor of character rests on the claim that moral exemplification cannot be replicated by AI systems (Azizah et al., 2026).

This view has a consequence for efficiency. If the teacher's presence is itself part of what is taught, a measure that counts only minutes saved will miss what matters. The time released by AI should therefore be judged by how far it extends the teacher's presence with learners, in dialogue, recitation, and mentoring, and not by how far it reduces that presence.

Teacher development and AI literacy

AI literacy has been organized into four aspects: knowing and understanding AI, using and applying it, evaluating and creating with it, and ethical issues (Ng et al., 2021). Teacher-specific work adapts the European DigCompEdu framework and a twenty-first century skills framework to AI (Ng et al., 2023). Celik (2023) extends TPACK into Intelligent-TPACK and

finds that technological knowledge alone does not suffice for educational integration; it matters when combined with pedagogical knowledge, and technological knowledge helps teachers assess the decisions of AI tools. Mishra et al. (2023) argue that generative AI is protean, opaque, and unstable, and that it is also generative and social, which requires a broader notion of contextual knowledge. UNESCO's framework defines 15 competencies in five dimensions: human-centred mindset, ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning (Miao & Cukurova, 2024).

Teacher knowledge, technology acceptance, and professional development

Teacher knowledge frameworks start from Shulman's (1986) argument that teaching depends on pedagogical content knowledge, the ways of representing a subject so that others can understand it. Mishra and Koehler (2006) added technological knowledge to produce TPACK, and the later work of Celik (2023) and Mishra et al. (2023) extends the idea to AI, as described above. For religious subjects, content knowledge includes the sources of the tradition and the methods by which claims about them are verified. A framework that treats content knowledge as a stable input therefore needs a further element when AI can produce fluent but unverified answers.

Whether teachers adopt a tool is a separate question from whether they use it well. The technology acceptance model holds that perceived usefulness and perceived ease of use shape acceptance (Davis, 1989), and the unified theory of acceptance and use of technology adds performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). Ertmer and Ottenbreit-Leftwich (2010) show that knowledge, confidence, beliefs, and culture intersect in teacher technology change. These accounts help explain why teachers in the Islamic education studies accept AI for administration, where usefulness is easy to see, and hesitate where it touches religious authority. They also suggest that guidelines and institutional support, which are facilitating conditions, belong in any adoption strategy.

Professional development research adds conditions for change. Guskey (2002) argues that teachers' beliefs often change after they see that a new practice improves student learning, which implies that training should let teachers try practices and observe the results. Desimone (2009) proposes core features of effective professional development: content focus, active learning, coherence, duration, and collective participation. Long and Magerko (2020) describe competencies and design considerations for AI literacy, and Ng et al. (2021) organize AI literacy into four aspects, as noted above. These findings guide the teacher development content proposed later in this paper.

Ethics, risk, and governance

Ethical concerns recur in most of the sources in the corpus. Holmes et al. (2022) discuss the ethics of AI in education and propose working toward a community-wide framework. Bond et al. (2024) call for more attention to ethics, collaboration, and rigour, and Kasneci et al. (2023) stress the need for competencies and literacies that cover the limits of large language models. In Islamic education the concerns include accuracy, limited treatment of spiritual and moral values, data privacy, and teacher overreliance (Luqmi et al., 2024; Zainadun et al., 2025). Students ask for guidelines grounded in Islamic values (Nordin et al., 2025), and Zulfikar et al. (2026) recommend that the Ministry of Religious Affairs and Islamic institutions issue them.

Governance therefore operates at several levels: the teacher's own verification practice, the institution's guidelines, and national policy such as competency frameworks (Miao &

Cukurova, 2024). The framework presented below treats these levels as parts of a single values anchor.

Research gap

Three gaps follow from this review. The efficiency literature is built mainly on general education and does not test what teachers do with the time saved in a religious education setting. The Islamic education literature describes applications and risks but offers no definition of efficiency that preserves the teacher's role. The competence frameworks include ethics in general terms and omit the verification of religious knowledge and its chain of transmission. The framework in Section 4 responds to these three gaps.

Methods

Research Design

This study is a conceptual paper based on a narrative review of the literature. It does not follow the PRISMA protocol and does not claim to be a systematic review. The aim is to build a framework from existing evidence, not to estimate effects.

A conceptual design was chosen because the problem is one of definition and structure. Existing studies measure time saved, list applications, or describe competencies, but none combines them for Islamic education, and an empirical study would have no agreed construct to measure. The output of the design is a framework with propositions, which in the sense used here are statements of expected relations that later studies can test.

Data Sources and Selection

Sources were identified through targeted searches of publisher and journal pages in October 2026, using combinations of the terms artificial intelligence, generative AI, ChatGPT, teaching efficiency, teacher workload, teacher competence, TPACK, AI literacy, Islamic religious education, and Qur'anic pedagogy. A source was included when it met four criteria: publication between 2021 and 2026, a clear focus on AI in teaching, teacher competence, or Islamic education, availability of full bibliographic data, and a verifiable DOI or official page. Blogs, news items, and sources without identifiable authors were excluded. The final set has 15 sources: seven peer-reviewed articles on AI and teachers in general education, one randomised trial report, one working paper, one UNESCO framework, and five studies from Islamic education.

Table 1 shows the composition of the final set. Other works are cited in this paper for conceptual grounding only. They include foundational statements of theories on teacher knowledge, technology acceptance, professional development, and cognitive load, and broader reviews of AI in education. These works were not coded, and the components and propositions were derived from the 15 sources in Table 1. The additional works are used to interpret and extend them, and some predate 2021 because they are the original statements of the theories they represent.

Table 1 Composition of the final source set (n = 15)

Category (n)	Sources	Design or focus
General education, peer-reviewed (7)	Bond et al. (2024); Celik (2023); Holmes & Tuomi (2022); Kasneci et al. (2023); Mishra et al. (2023); Ng et al. (2021); Ng et al. (2023)	Reviews, an empirical study of teacher knowledge, and conceptual work on AI in education, teacher competence, and AI literacy

Category (n)	Sources	Design or focus
Randomised trial report (1)	Roy et al. (2024)	School-randomised trial of ChatGPT in lesson preparation (259 teachers, 68 schools)
Working paper (1)	Keppler et al. (2024)	Model of teacher task selection with generative AI
International framework (1)	Miao & Cukurova (2024)	UNESCO AI competency framework for teachers
Islamic education (5)	Azizah et al. (2026); Luqmi et al. (2024); Nordin et al. (2025); Zainadun et al. (2025); Zulfikar et al. (2026)	Library study, literature reviews (14 and 39 studies), mixed-methods student study, and phenomenological interview study

Data Analysis Technique

The analysis proceeded in three steps. The first step coded each source for the efficiency domain it addresses, the pedagogical role it assigns to the teacher, and the competence it requires. The second step compared the codes across the general and the Islamic education sources to find where they agree and where Islamic education adds a requirement. The third step turned the points of agreement and the additional requirements into components and propositions. Because the source set is small and selected, the framework is offered as a basis for testing and not as a finding.

Table 2 gives the coding scheme used in the first step. Each source was read in full and coded by hand against the three categories listed there, and a source could receive more than one code. A fourth code recorded the boundary conditions that a source places on AI use. The comparison in the second step placed the codes of the general education sources next to those of the Islamic education sources and asked, for each code, whether the Islamic education sources repeated it, qualified it, or added a requirement.

Table 2 Coding scheme

Code	Definition	Examples from the source set
Efficiency domain	The area of teaching work in which a source reports or expects a gain	Planning and material development; assessment and feedback; monitoring and administration
Teacher role	The pedagogical function the source assigns to the teacher when AI is used	Facilitator; knowledge curator; digital ethics guide; mentor of character
Required competence	The knowledge or skill that the source says teachers need	AI literacy; Intelligent-TPACK; UNESCO competencies; verification of religious knowledge
Boundary condition	A limit that the source places on AI use	No substitute for talaqqi; supremacy of sanad; ethical guidelines

Trustworthiness of the Analysis

Because a narrative review depends on the judgment of the reviewer, several steps were taken to make that judgment visible. The search terms and the inclusion and exclusion criteria are stated above. Each component and proposition is tied to named sources in Table 3, so a reader can trace it back. Claims that rest on transfer from general education are marked as such in the critical analysis. The paper does not report effect sizes or statistical tests, and where a source reports a figure, the figure is attributed to that source. The main threat is selection bias, since targeted searches can miss relevant work, and it is acknowledged under the limitations.

Results

Defining teaching efficiency in Islamic education

In this paper, teaching efficiency in Islamic education is the share of teacher time released from routine tasks by AI that is reinvested in work only a teacher can do, such as mentoring, dialogue, and talaqqi, without loss of accuracy in religious content. The definition has two parts that general efficiency measures lack. It counts reinvestment, not only time saved, and it adds a condition on the accuracy of religious knowledge.

The definition can be read as three conditions that must hold together. The first is release: AI reduces the time spent on routine tasks such as drafting, formatting, and marking. The second is reinvestment: a meaningful share of the released time goes to activities in which the teacher's own presence matters. The third is accuracy: the religious content that learners receive remains correct and traceable to authoritative sources. If any condition fails, the efficiency is only apparent. Time can be released and then spent on more paperwork. Time can be reinvested while inaccurate content circulates. Content can be accurate because the teacher checks everything by hand, but then little time is released.

This reading explains why the definition departs from managerial measures. A school that measures only hours saved would rate a teacher who prepares a worksheet in ten minutes above a teacher who spends an hour on the same worksheet, whatever each does with the remaining time and whatever the worksheet contains. The definition asks what happened to the hour. In the English trial, a saving of about 25 minutes per week was reported without a difference in the quality of resources (Roy et al., 2024). The definition would ask in addition how those minutes were used and whether the content was correct for the subject.

Two indicators follow from the definition and are offered as proposals for later studies, not as validated measures. A release indicator is the change in weekly time spent on a defined set of routine tasks. A reinvestment indicator is the share of that change that reappears as time in mentoring, dialogue, recitation guidance, or other activities that the institution has listed in advance. Accuracy would be assessed by reviewing AI-assisted materials against authoritative sources.

The four-component framework

Table 3 The four-component framework and its evidence base

Component	What it covers	Evidence base	Islamic education requirement
1. Efficiency domains	Planning and material development, assessment and feedback, monitoring and administration	Roy et al. (2024); Zainadun et al. (2025); Luqmi et al. (2024)	Content generated by AI is checked against authoritative sources before use
2. Pedagogical reinvestment	Released time moves to mentoring, dialogue, talaqqi, and character guidance	Keppler et al. (2024); Azizah et al. (2026); Roy et al. (2024)	Reinvestment is planned by the institution, not left to chance
3. Teacher competence	AI literacy, Intelligent-TPACK, and the UNESCO competency dimensions	Ng et al. (2021, 2023); Celik (2023); Mishra et al. (2023); Miao & Cukurova (2024)	Added competence in verifying religious knowledge and its sources
4. Values anchor	Sanad, authenticity of knowledge, ethical guidelines, teacher authority	Nordin et al. (2025); Zulfikar et al. (2026)	Guidelines issued at ministry and institution level

The components work in sequence and also in feedback. AI use in the efficiency domains releases time. The reinvestment component determines whether that time becomes pedagogical value. Teacher competence determines how much time is released and how safely, and the values anchor sets the limits within which all three operate.

Figure 1 shows the four components and the relations among them. The three inner components follow the sequence described above, and the values anchor surrounds them.

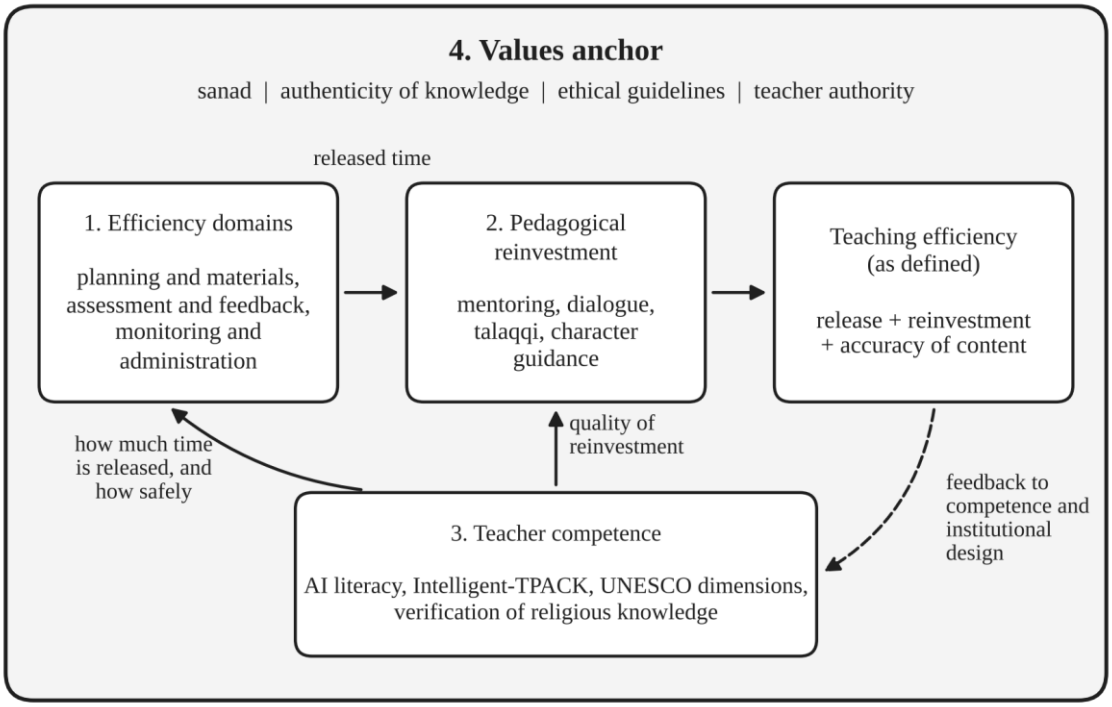


Figure 1 The four-component framework (author's conceptual model)

Efficiency domains

The first component names where AI can release time. The evidence is clearest for planning and material development, where a trial found that teachers who used ChatGPT for lesson preparation spent less time without a difference in the quality of resources (Roy et al., 2024). Assessment and feedback form the second domain. Automated assessment and recitation support are among the applications reported for Qur'anic pedagogy (Zainadun et al., 2025), and adaptive learning and automatic assessment are listed as benefits in studies of PAI learning (Luqmi et al., 2024). Automated feedback should be judged by what learners do with it and not only by how fast it arrives. The third domain is monitoring and administration, which the PAI teachers in Zulfikar et al. (2026) were willing to hand to AI. The requirement attached to this component is that AI-generated content is checked against authoritative sources before use. The domains with the largest expected gain, materials and assessment, are also those in which an error in religious content would reach learners directly.

Pedagogical reinvestment

The second component addresses what the first leaves open. Released time is only potential value. The English trial reports that teachers used saved time to complete other planning tasks or to reduce workload, as discussed in the critical analysis below, so reinvestment in higher-value work does not follow automatically. The framework therefore treats reinvestment as a component with its own design. The activities named in the literature are mentoring, dialogue, talaqqi, and character guidance (Azizah et al., 2026; Zulfikar et al.,

2026). Research on the science of learning and development points to the importance of supportive relationships and environments (Darling-Hammond et al., 2020), which gives a general reason to expect these activities to matter. The requirement in Islamic education is that reinvestment is planned by the institution. Timetables, class sizes, and supervision arrangements decide whether a teacher can give an hour to a struggling reciter, and an individual teacher cannot change them alone.

Teacher competence

The third component specifies what teachers need to realize the first two. It combines the four aspects of AI literacy (Ng et al., 2021), Intelligent-TPACK (Celik, 2023), the five dimensions of the UNESCO framework (Miao & Cukurova, 2024), and the view that generative AI requires a broader notion of contextual knowledge (Mishra et al., 2023). Competence has two expected effects in the model. It shapes how much time AI can release, because teachers who can judge outputs can be expected to discard less. It also shapes safety, because teachers who can evaluate outputs are less likely to pass on errors. The paper adds one competence that the frameworks do not name, the verification of religious knowledge and its sources. In practice this means checking quotations and rulings against recognized references, recognizing when a generated answer mixes sources or supplies a citation that cannot be traced, and knowing which questions should be referred to a qualified scholar.

Values anchor

The fourth component sets limits within which the other three operate. It has four parts: sanad, the authenticity of knowledge, ethical guidelines, and the authority of the teacher. Studies of students and teachers in Islamic education show that these concerns are not peripheral. Students link AI use to the integrity of sanad and ask for ethical guidelines (Nordin et al., 2025), and teachers reject AI as a substitute for talaqqi (Zulfikar et al., 2026). The anchor also has an institutional side, because guidelines issued at ministry and institution level give individual teachers a basis for decisions that they would otherwise make alone. The anchor is not a brake on efficiency. It is the condition that makes released time count as value in Islamic education, since time saved by methods that weaken sanad would not be counted as a gain under the definition given above.

Propositions

P1. Efficiency gains are larger when teachers use AI to redesign their tasks than when they use it to automate existing tasks (Keppler et al., 2024; Roy et al., 2024).

P2. Released time improves learning quality in Islamic education only when it is reinvested in mentoring and talaqqi (Azizah et al., 2026; Zulfikar et al., 2026).

P3. Teacher competence, defined as Intelligent-TPACK plus the verification of religious knowledge, strengthens the link between AI use and efficiency (Celik, 2023; Mishra et al., 2023; Ng et al., 2021).

P4. A values anchor based on sanad and institutional guidelines lowers the risk of inaccurate content and overreliance and sustains teacher authority (Nordin et al., 2025; Zainadun et al., 2025).

P1 rests on evidence from general education. P2 to P4 are inferences from Islamic education studies that are mostly qualitative or review-based, so they are hypotheses and not established relations.

Rationale and boundary conditions

P1 follows from the contrast between using AI to complete existing tasks and using it to decide which tasks to do (Keppler et al., 2024) and from the finding that modest, selective use produced savings in the English trial (Roy et al., 2024). Its boundary condition is that the gain depends on teachers having the discretion to change their tasks. Where lesson plans and templates are fixed by the institution, redesign may not be possible.

P2 rests on the Islamic education studies that assign the teacher the roles of mentor and guide and that reject AI as a substitute for talaqqi (Azizah et al., 2026; Zulfikar et al., 2026). The proposition is conditional: released time improves learning quality only if it is reinvested. A rival expectation is that released time has no effect, or a negative one, when it is absorbed by other administrative work, and the critical analysis below treats this as a plausible outcome.

P3 draws on Celik (2023), who finds that technological knowledge matters when combined with pedagogical knowledge, and on Mishra et al. (2023) and Ng et al. (2021). It is stated as a moderation relation: the link between AI use and efficiency is stronger when competence is higher. The verification component is this paper's addition, and none of the sources has tested its effect.

P4 combines the concern about inaccurate content and overreliance in Zainadun et al. (2025) with the demand for guidelines in Nordin et al. (2025). It is the proposition with the weakest evidence, because the sources describe risks and perceptions and do not compare institutions with and without guidelines. Table 4 suggests how each proposition could be examined.

Table 4 Proposed operationalization of the propositions

Proposition	Main variables	Possible indicators	Suitable design
P1	Task redesign (predictor); time saved (outcome)	Share of AI use at the planning level versus the task level; weekly planning time	Quasi-experiment with two teacher groups; time logs
P2	Reinvestment (moderator); learning quality (outcome)	Hours spent in mentoring and talaqqi; recitation or comprehension assessments; learner and teacher reports	Mixed methods; classroom observation with pre- and post-assessment
P3	Teacher competence (moderator)	A measure of Intelligent-TPACK; AI literacy test; score on a verification task	Survey with moderation analysis; performance tasks
P4	Values anchor (predictor); content errors and overreliance (outcomes)	Presence and use of guidelines; errors found on review of AI-assisted materials; reported overreliance	Comparative case study of institutions; document review

Discussion

Interpretation in Light of Prior Studies

The framework confirms and qualifies the studies it draws on. It confirms the general education finding that efficiency gains depend on how teachers use a tool (Keppler et al., 2024; Roy et al., 2024) and extends it by asking what happens to released time in a setting where the teacher's presence is part of the curriculum. It agrees with the Islamic education reviews that list adaptive learning, interactive media, and automated assessment as benefits (Luqmi et al., 2024; Zainadun et al., 2025), but it does not treat those benefits as efficiency until the three conditions of release, reinvestment, and accuracy are met. It differs from the competence

frameworks in adding the verification of religious knowledge to the competencies of ethics and pedagogy (Miao & Cukurova, 2024; Ng et al., 2021).

The framework is also consistent with the view that technology acceptance is shaped by perceived usefulness and by facilitating conditions (Davis, 1989; Venkatesh et al., 2003). Teachers in the Islamic education studies accept AI where it is plainly useful and reject it where it threatens authority. The values anchor can be read as a facilitating condition that makes acceptance possible without a loss of that authority. An apparent inconsistency is the optimism of the benefit-oriented reviews against the caution of the teacher interviews. The framework explains it by distinguishing domains. The reviews describe what AI can do in the efficiency domains, while the teachers describe what should stay in the domain of reinvestment and under the values anchor.

Critical analysis

The strongest efficiency evidence comes from a trial in English science classrooms, not from religious education (Roy et al., 2024). The trial also shows that teachers used the saved time to complete other planning tasks or to reduce workload, which means reinvestment in higher-value work does not follow automatically. This supports P2 and argues for institutional design of how released time is used. The Islamic education sources describe applications and perceptions, but they do not report time saved by teachers (Luqmi et al., 2024; Zainadun et al., 2025; Zulfikar et al., 2026). The claim that AI raises efficiency in Islamic education therefore rests on transfer from general education and on teacher reports. Finally, the rejection of AI as a substitute for talaqqi is based on a small interview sample (Zulfikar et al., 2026), and it should be tested with larger samples across institution types.

Implications for teacher development

The framework suggests five content areas for teacher development programs. The first is AI literacy covering the four aspects of knowing, using, evaluating, and ethics (Ng et al., 2021). The second is practice in Intelligent-TPACK, with attention to how AI changes pedagogical and content decisions (Celik, 2023). The third is task redesign, so that teachers use AI at the planning level and not only at the task level (Keppler et al., 2024). The fourth is verification of religious content against authoritative sources and the chain of transmission, which is the addition proposed by this paper. The fifth is familiarity with institutional guidelines, and Zulfikar et al. (2026) recommend that the Ministry of Religious Affairs and Islamic institutions issue such guidelines. For policy, the UNESCO framework offers a template for national competency programs that can be adapted with a religious knowledge component (Miao & Cukurova, 2024). For research, the propositions can be tested with a quasi-experimental design that measures planning time, the use of released time, and learning outcomes in madrasah and pesantren settings.

Designing a Teacher Development Program

The five content areas in the previous section can be arranged as a program. Following Desimone (2009), the design should have a content focus, active learning, coherence with the school's goals, sufficient duration, and collective participation. Following Guskey (2002), it should let teachers try new practices and see their effects on learners. Table 5 gives an outline. The modules are suggestions for adaptation and have not been tested.

Table 5 Outline of a teacher development program

Module	Content	Activity	Link to the framework
1. AI literacy	Knowing, using, and evaluating AI, and its ethical issues (Ng et al., 2021)	Hands-on exploration of a generative tool with PAI materials	Teacher competence
2. Intelligent-TPACK	How AI changes decisions about pedagogy and content (Celik, 2023)	Redesign of one unit plan in small teams	Teacher competence
3. Task redesign	Planning-level use versus task-level use (Keppler et al., 2024)	Audit of one's own weekly tasks; choose tasks to drop, shorten, or delegate	Efficiency domains; P1
4. Verification of religious content	Checking quotations and rulings against authoritative sources; referring questions to scholars	Error-finding exercise on generated materials	Teacher competence; values anchor; P3, P4
5. Reinvestment planning	Planning the use of released time for mentoring, dialogue, and talaqqi	Timetable and class-size workshop with school leaders	Pedagogical reinvestment; P2
6. Guidelines and ethics	Institutional and ministry guidelines; data privacy	Drafting a school guideline with a sampling review	Values anchor; P4

Limitations

Several limitations should be stated. The source set is small and was selected through targeted searches, so relevant work may be missing. The efficiency evidence comes from a single trial in English science classrooms, and the Islamic education sources are mainly reviews, a library study, and small qualitative or survey studies. The propositions are inferences, and the indicators in Table 4 have not been validated. The paper does not examine differences among Islamic education settings, such as madrasah, pesantren, and Islamic higher education, or differences among countries and schools of thought, which may affect views on AI and on the authority of sources. Finally, the field changes quickly, and tools and teacher practices in 2026 may differ from those described in the sources reviewed.

Directions for Future Research

Future work can proceed in four directions. The first is measurement: developing and validating indicators of release, reinvestment, and accuracy, and a measure of verification competence. The second is testing the propositions with quasi-experimental designs that compare teachers who redesign tasks with teachers who automate them, using time logs and learner outcomes. The third is qualitative work on how teachers decide what to hand to AI and what to keep, in madrasah, pesantren, and Islamic higher education, which would show whether the boundary drawn by the PAI teachers in the interview study holds across settings. The fourth is design research on verification supports and institutional guidelines, evaluating whether they reduce errors and overreliance without discouraging useful use. Comparative studies across countries would show how national policy and religious traditions shape these relations.

Conclusion

The first objective was to define teaching efficiency for Islamic education. The paper defines it as released teacher time that is reinvested in mentoring, dialogue, and talaqqi without loss of accuracy in religious content. The second objective was to identify which modern practices AI can support. AI supports planning, material development, assessment, and monitoring, and the sources assign the teacher the roles of facilitator, knowledge curator, digital ethics guide, and mentor of character, which AI does not replace. The third objective was to

specify the competencies that teacher development should build. These are AI literacy, Intelligent-TPACK, task redesign, verification of religious knowledge, and familiarity with institutional guidelines.

The main limitation is the source base. The set is small, it was selected through targeted searches, and the efficiency evidence comes from general education. The Islamic education sources are mostly reviews, library studies, and small qualitative or survey studies. Further research should test the four propositions with quasi-experimental or mixed-methods designs in madrasah, pesantren, and Islamic higher education, should measure time saved and the use of that time, and should examine whether verification training changes the accuracy of AI-assisted religious content.

Taken together, the paper argues that teaching efficiency in Islamic education should be judged by what teachers and learners gain from the time that AI releases, and not by the time alone. The framework gives teachers, institutions, and policy makers a shared vocabulary for that judgment, and the propositions give researchers a starting point for testing it. Whether the expected gains appear in practice is an empirical question, and the paper has aimed to make that test possible.

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Conflict of interests

The authors declare that they have no conflict of interest.

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