

Tawaqquf Pedagogy: Reconstructing the Regulation of Epistemic Judgement in Islamic Education in the Age of Artificial Intelligence

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ABSTRACT

The development of generative artificial intelligence (GenAI) raises concerns about learners' independence of judgement when information is accepted without sufficient evaluation of evidence or justification. This study aims to identify the epistemic structure and mechanisms of tawaqquf in classical Islamic literature and to reconstruct these into a pedagogical framework for strengthening epistemic agency in GenAI-assisted learning. Employing a two-stage qualitative approach, the study combines document analysis and conceptual theory-building based on 25 argumentative units drawn from seven classical works by six authors. The data were examined through semantic coding, cross-unit comparison and pattern analysis; the findings were then brought into dialogue with contemporary theories of educational psychology and epistemology. The findings identify six epistemic functions: Epistemic Diagnosis (ED), Evidence–Commitment Calibration (EC), Deliberate Restraint (DR), Active Resolution/Inquiry (AR), Revisability and Exit (RX), and Boundary Governance (BG). Together, these functions constitute a conditional and non-linear architecture for regulating epistemic commitment. EC is proposed as a candidate linking mechanism between the adequacy of evidence and the degree of commitment warranted by that evidence, while BG governs the conditions and limits of legitimate suspension of judgement. The reconstruction yields Tawaqquf Pedagogy and Tawaqquf-Based Epistemic Agency (TBEA), together with seven theoretical propositions for learning practices that retain learners' responsibility for evaluation and justification. The study's originality lies in integrating classical Islamic epistemic principles with mechanisms of evidence–commitment regulation within a contemporary pedagogical framework. However, the purposively selected corpus and the absence of empirical validation mean that its contribution remains conceptual and requires subsequent empirical investigation.

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INTRODUCTION

The development of generative artificial intelligence (GenAI) is transforming how learners seek information, construct arguments and produce academic responses. Research has reported benefits for learning outcomes, engagement and selected cognitive skills (Chen & Cheung, 2025; Deng et al., 2025). However, improved performance while using AI does not necessarily reflect learning that endures once technological assistance is withdrawn. Using AI without adequate pedagogical support may improve learners' success in completing tasks while potentially diminishing their learning outcomes when they are required to work independently without AI assistance (Bastani et al., 2025). This tension relates to cognitive offloading, whereby some cognitive work is delegated to external resources (Risko & Gilbert, 2016). Such delegation may free cognitive resources for deeper thinking, yet can impede capability development when the processes delegated are themselves intended learning outcomes (Nakamura, 2026). The risks of metacognitive laziness (Fan et al., 2025), the need for self-regulatory support (Xu et al., 2025) and a tendency to rely on AI-generated outputs (Hou et al., 2025; Zhai et al., 2024) suggest that the educational problem concerns not simply the accuracy of answers, but whether learners remain actively engaged in evaluating claims and justifying what they come to know.

This study conceptualises one such risk as premature epistemic commitment: accepting, rejecting or expressing certainty about a claim before adequately examining the quality of the evidence, the credibility of its sources, alternative explanations and the limits of the claim. This risk is not equivalent to factual errors in AI outputs: even a correct answer may be accepted for reasons the learner does not understand. Research on epistemic dependence highlights the risk that verification and justification will be delegated to technology (Du & Yuan, 2026), while epistemic trustworthiness draws attention to the quality of information environments and AI tutors (Tanchuk & Taylor, 2025). Human-GenAI collaboration must therefore preserve learners' epistemic agency, so that technology supports thinking and knowledge formation rather than replacing the human capacity to evaluate evidence, exercise judgement and take responsibility for conclusions (Wu et al., 2025). Several established perspectives illuminate this concern: metacognition, understood as the monitoring and control of thinking (Flavell, 1979); self-regulated learning, involving the regulation of goals, strategies and reflection (Zimmerman, 2002); and epistemic vigilance, which involves evaluating sources and messages (Bielik & Krell, 2025; Sperber et al., 2010). Scholarship on epistemic agency emphasises learners' active participation in knowledge-making practices (Nieminen & Ketonen, 2024), while work on suspension of judgement establishes that withholding judgement can be justified when the available reasons are inconclusive (Vollmer, 2024). Taken together, these perspectives illuminate important aspects of judgement, but do not by themselves specify an integrated pedagogical

framework for determining when a learner should form an epistemic commitment, how strong it should be or how narrowly it should be framed in GenAI-assisted learning.

Against this background, the study formulates three interrelated gaps in theoretical integration. First, the construct gap concerns the need to connect evidence evaluation with the degree of commitment warranted by the evidence, rather than stopping at assessments of information credibility. Second, the mechanism gap concerns the conditions under which withholding a decision, narrowing a claim, undertaking further inquiry, revising a judgement or ending suspension is a proportionate response. Third, the pedagogical translation gap concerns how these relationships can be translated into learning practices that retain learners' responsibility for justification even when technology facilitates information exploration. These are gaps in the integration of selected theoretical perspectives, not claims that their constituent ideas have never been examined. The Islamic epistemic tradition provides a conceptual basis for investigating the regulation of judgement through *tawaqquf*, whose legitimacy must be assessed in relation to historical context, the nature of the question and the adequacy of the evidence. In theological debates, *tawaqquf* has limitations when treated as a universal response to undecidable propositions. Conversely, al-Rāzī's withholding of certainty (*jazm*) in discussing the origins of language illustrates how suspension of judgement can be warranted when the available evidence does not establish one alternative over another. This distinction suggests that the relevance of *tawaqquf* lies not in perpetuating doubt but in proportionately calibrating epistemic commitment to the strength and limits of available evidence (Ahsan, 2026; Bigliardi, 2025; Malik, 2026).

To investigate this potential contribution, the study employs qualitative document analysis and a two-stage conceptual reconstruction of 25 argumentative units drawn from seven classical works by six authors. The first stage identifies the argumentative functions of *tawaqquf* within the corpus; the second brings these findings into dialogue with educational psychology, contemporary epistemology and GenAI research. This separation is necessary to avoid attributing contemporary pedagogical categories to classical authors as though they were their historical intentions. The reconstruction concerns six functions, analytically designated Epistemic Diagnosis (ED), Evidence-Commitment Calibration (EC), Deliberate Restraint (DR), Active Resolution/Inquiry (AR), Revisability and Exit (RX), and Boundary Governance (BG). These functions are analysed as conditionally related, rather than as stages in a universal linear sequence. Within this framework, EC links the quality and scope of evidence to the level of commitment warranted, while BG prevents suspension from becoming unlimited scepticism or the postponement of decisions once sufficient justification is available. The frequencies with which functions are identified are treated as descriptions internal to the corpus, not as measures of prevalence across Islamic intellectual history or evidence of a causal psychological sequence.

The study's contribution is to reconstruct *tawaqquf* as Tawaqquf Pedagogy and to propose Tawaqquf-Based Epistemic Agency (TBEA), a

theoretical account of how learners may regulate epistemic commitment responsibly when using GenAI. The model does not replace theories of metacognition or epistemic agency; rather, it proposes more explicit relationships between diagnosing evidential problems, calibrating commitment, selectively withholding judgement or undertaking inquiry, revising judgements and regulating the limits of judgement. Under the proposed human–AI division of labour, technology may assist with exploring and comparing information, while learners continue to develop responsibility for evaluating evidential adequacy and justifying conclusions. This study therefore aims, first, to identify the conceptual structure, triggering conditions, mechanisms and epistemic limits of *tawaqquf* in classical Islamic literature and, second, to reconstruct these features into a pedagogical framework for GenAI-assisted learning. The study addresses two research questions: (1) What are the conceptual structure, triggering conditions, mechanisms and epistemic boundaries of *tawaqquf* in classical Islamic literature? (2) How can these structures and mechanisms be reconstructed into a pedagogical model that strengthens the regulation of epistemic commitment and epistemic agency in GenAI-assisted learning? In this article, TBEA is the outcome of theory development rather than an empirically validated model; its pedagogical implications are consequently presented as propositions for future testing.

METHODS

This study adopts a qualitative, two-stage design integrating qualitative document analysis and conceptual theory-building (Jaakkola, 2020; Sankofa, 2023). The first stage addresses RQ1 by analysing the epistemic functions of *tawaqquf* in classical Islamic literature, while the second addresses RQ2 through a theoretical reconstruction that brings the historical findings into dialogue with educational psychology, contemporary epistemology and research on generative artificial intelligence (GenAI)-assisted learning. The stages are analytically separated to avoid anachronism and prevent contemporary constructs from being imposed as *a priori* categories when interpreting classical sources (van Hulst & Visser, 2025; Vila-Henninger et al., 2024). The object of analysis is the regulation of epistemic commitment through *tawaqquf*. The unit of analysis is the argumentative unit, defined as the smallest passage that preserves a discernible epistemic function within its argumentative context. The final corpus comprises 25 units (U01–U25) from seven works by six authors al-Juwaynī, al-Ghazālī, Fakhr al-Dīn al-Rāzī, al-Shātibī, al-Shāfi‘ī and Ibn Qutaybah spanning *uṣūl al-fiqh*, Qur’anic exegesis and *ikhtilāf/mukhtalif al-ḥadīth* literature (al-Ghazālī, 1993; al-Juwaynī, 1997; al-Rāzī, 1981, 1992; al-Shāfi‘ī, 1986; al-Shātibī, 1997; Qutaybah, 1999).

The corpus was selected through purposive and theoretically informed sampling, considering genre diversity, the relevance of epistemic arguments, variation in mechanisms, the presence of boundary and negative cases, and the traceability of editions and primary-text locations (Sankofa, 2023; Vila-Henninger et al., 2024). Data were collected using two complementary retrieval strategies: literal–lexical retrieval of *waqf/tawaqquf* and related forms, and contextual–functional retrieval of discussions concerning *dalīl*, *bayān*, *tarjīḥ*, *qaṭ‘/jazm*, *shakk*, conflicting

evidence and limitations on claims. Each candidate was examined in its argumentative context and classified as literal evidence (L), a boundary or negative case (B), functional equivalence (F), or a combination of these categories. The corpus contains 16 L units, three B units, two L/B units, one B/meta unit, one F unit and two F/B units. Passages lacking epistemic relevance, adequate argumentative support or traceable sources were excluded. Source verification covered the author, work, edition, volume or juz' and printed page number, rather than relying solely on digital-file pagination. Selection procedures and the edition register are documented in Supplementary Table S4, while Arabic evidence, contextual information and the locator for each unit appear in S1.

The RQ1 corpus was analysed through open semantic coding, cross-unit comparison, category consolidation and interpretative pattern analysis (Braun & Clarke, 2021; Vila-Henninger et al., 2024). Coding focused on the argumentative functions of the texts rather than on the occurrence of particular terms and yielded six analytical categories: Epistemic Diagnosis (ED), Evidence-Commitment Calibration (EC), Deliberate Restraint (DR), Active Resolution/Inquiry (AR), Revisability and Exit (RX), and Boundary Governance (BG). Operational definitions, inclusion and exclusion criteria, and decision rules are specified in the S2 codebook. Multiple coding was permitted where each function had distinct textual or argumentative support. Once categories and coding decisions had been finalised, the RQ1 coding matrix was frozen before descriptive analysis to prevent retrospective alterations. The 25×6 binary matrix in S3 was used to calculate frequencies, percentages, pairwise co-occurrences and recurring configurations. Negative-case analysis, particularly of U02, U06 and U14, was used to examine the limits within which suspension is legitimate (Lane, 2021; Sale, 2022). All calculations were descriptive; no inferential statistical tests were conducted because purposive corpus selection did not support population-level inference about classical Islamic intellectual traditions.

After the RQ1 corpus had been frozen, RQ2 was examined through theory-guided integrative comparison and conceptual reconstruction (Jaakkola, 2020; van Hulst & Visser, 2025). The six epistemic functions were compared with metacognitive regulation, self-regulated learning, epistemic vigilance, suspension of judgement, epistemic agency, cognitive offloading and epistemic dependence to identify functional similarities, conceptual differences, pedagogical mechanisms and boundary conditions (Lan & Zhou, 2025; van Hulst & Visser, 2025). The synthesis proceeded from RQ1 constructs and comparator theories to an assessment of functional correspondences and conceptual differences, followed by mechanism reconstruction and proposition development. The resulting framework consists of Tawaqquf Pedagogy and Tawaqquf-Based Epistemic Agency (TBEA), together with seven theoretical propositions documented in S5. EC was designated a candidate linking mechanism because of its explanatory capacity to connect evidential adequacy with degrees of commitment, not because of its frequency of occurrence; BG was positioned as a cross-process boundary-regulating function. These designations are outcomes of conceptual synthesis, not empirically established causal relationships.

The trustworthiness of the analysis was supported by the documented S1–S5 chain

of evidence, which connects primary quotations, coding decisions, cross-unit patterns, selection procedures and pedagogical reconstruction. Consistency was strengthened through consistent, edition-specific text locators, explicit coding rules, negative-case analysis and the separation of historical interpretation from contemporary theory development (Braun & Clarke, 2021; Sale, 2022). The study involved no human participants or personal data. Its limitations include the purposively selected corpus, the absence of an independent expert audit and formal intercoder reliability testing, and the lack of empirical validation of TBEA. Accordingly, the study offers a conceptual reconstruction and pedagogical propositions that require further investigation through instrument development, think-aloud protocols, process tracing, human-AI learning experiments or longitudinal research

RESULT AND DISCUSSION

Result

The Epistemic Structure of Tawaqquf in Classical Islamic Literature

The analysis of 25 argumentative units (U01-U25) from seven classical works by six authors identified six epistemic functions of tawaqquf: Epistemic Diagnosis (ED), Evidence-Commitment Calibration (EC), Deliberate Restraint (DR), Active Resolution/Inquiry (AR), Revisability and Exit (RX), and Boundary Governance (BG). These categories were generated through analysis of argumentative functions; they are not labels uniformly employed by the classical authors. As shown in Table 1, RX was the most frequently identified function (24/25; 96%), followed by ED (23/25; 92%), DR (20/25; 80%), EC (19/25; 76%), BG (14/25; 56%) and AR (12/25; 48%). Within this corpus, the distribution suggests that the suspension of judgement in the corpus cannot be reduced to passive doubt: it is associated with regulating evidential adequacy, degrees of commitment, the possibility of resolution and the limits of legitimate suspension. These frequencies describe patterns within the purposively selected corpus rather than prevalence throughout the classical Islamic intellectual tradition.

Table 1. Distribution of the Six Epistemic Functions of Tawaqquf in the Classical Corpus (N = 25)

Epistemic function	n	%	Main characteristic
Epistemic Diagnosis (ED)	23	92	Identifies epistemic conditions that prevent a claim from being established
Evidence-Commitment Calibration (EC)	19	76	Aligns the degree and scope of commitment with the evidence
Deliberate Restraint (DR)	20	80	Seeks resolution through targeted inquiry or another justified form of adjudication

Active Resolution/Inquiry (AR)	12	48	Allows revision of a judgement or an end to suspension
Revisability and Exit (RX)	24	96	Enables revision or the termination of suspension
Boundary Governance (BG)	14	56	Governs the scope, domain, conditions and limits of applying tawaqquf

Note. Units could receive multiple codes when each function had independent textual or argumentative support. Frequencies and percentages are descriptive statistics internal to the corpus. Source: analysis of the classical corpus, Supplementary Tables S1–S3.

The findings for ED and EC reveal a fundamental distinction between recognising inadequate evidence and determining its implications for epistemic commitment. ED encompasses ambiguity of meaning, conflicts between textual proofs, limitations of knowledge sources and discrepancies between the scope of a claim and its justification. In U10, al-Ghazālī discusses a report whose truth or falsity remains unknown, such that neither affirmation nor denial is adequately justified (al-Ghazālī, 1993, vol. 2, p. 175). Meanwhile, U19 illustrates al-Rāzī's restriction on specifying the number of the Companions of the Cave (Aṣḥāb al-Kahf) through the statement «هذا التعيين لا دليل عليه، فوجب التوقف وترك القطع»، indicating that the absence of evidence for a particular determination requires withholding certainty regarding that claim (al-Rāzī, 1981, juz' 21, p. 108). Both cases identify evidential insufficiency, but U19 also demonstrates EC by connecting the strength of evidence with how specifically a conclusion can be warranted. EC was found in 19 units and co-occurred with ED in 17 units. Its proposed linking role rests on explanatory significance, not frequency: the function helps explain why a given evidential basis warrants affirmation, a narrower claim or withheld commitment.

The distinction between DR and AR indicates that suspending judgement need not always lead to further inquiry. DR was identified in 20 units, compared with only 12 for AR. In U15, al-Rāzī describes withholding jazm when several possible accounts of the origins of language cannot be resolved on the available evidence (al-Rāzī, 1992, vol. 1, p. 182). U20 shows that al-Shāṭibī regards tawaqquf as appropriate where the grounds for tarjīḥ do not yet justify selecting one alternative (al-Shāṭibī, 1997, vol. 5, p. 113). Conversely, in U13, al-Ghazālī connects suspension with seeking evidence from another source, making AR a directed path towards resolution (al-Ghazālī, 1993, vol. 4, p. 63). AR co-occurred with RX in all 12 relevant units, indicating a descriptive association between inquiry and the possibility of revising epistemic status. In U23, however, al-Shāfi'ī demonstrates resolution by reconciling two hadiths without DR; hence, inquiry is not invariably preceded by suspension (al-Shāfi'ī, 1986, pp. 39–40). These patterns support treating DR and AR as conditional responses, shaped by the character of the problem and the prospect of resolution.

RX and BG clarify the temporal limits, scope and legitimacy of epistemic responses. RX was found in 24 units and BG in 14. In U12, al-Ghazālī links suspension to the emergence of evidence, leaving the status of a judgement open

to change as its evidential basis develops (al-Ghazālī, 1993, vol. 3, p. 635). Yet such openness does not justify indefinite suspension. U14 states: «ولا سبيل إلى التوقف إلى غير» «نهاية فإن فيه تعطيلًا», indicating that endless suspension can result in taʿṭīl, or the obstruction of decisions and action (al-Ghazālī, 1993, vol. 4, p. 114). The negative cases U02 and U06 in al-Juwaynī show that suspension is unnecessary when the evidence is adequate (al-Juwaynī, 1997, vol. 1, pp. 81, 112). A further boundary is evident in U25, where Ibn Qutaybah restricts claims about unseen matters to the information available (Qutaybah, 1999, p. 196). Thus, RX preserves the possibility of revising a judgement or ending suspension, while BG defines the scope, conditions and limits of its applicability.

Cross-unit configurational analysis reveals conditional and non-linear associations among the six functions. The two most frequent configurations each occur in six units: ED-EC-DR-RX-BG in U01, U03, U14, U17, U19 and U25, and ED-EC-DR-AR-RX in U07, U12, U13, U16, U20 and U22. The first configuration emphasises withholding commitment while regulating the scope or evidential limits of a claim; the second involves restraint accompanied by a route towards resolution. Other variations indicate that not all functions must occur together. U02 and U06 contain neither ED nor DR because evidential sufficiency removes the need for suspension; U21 contains ED-EC-BG as a metatheoretical reflection on the limits of the evaluator; and U24 illustrates the adjudication of conflicting hadiths without DR. The co-occurrence of ED-DR and DR-RX in 20 units each, and EC-DR in 15 units, indicates descriptive associations among diagnosis, calibration, restraint and openness to revision. Neither co-occurrence nor repeated configuration, however, establishes a causal pathway or fixed temporal sequence.

Taken together, the RQ1 findings support an interpretation of tawaqquf as a conditional, non-linear architecture for regulating epistemic commitment. ED recognises evidential problems; EC connects evidential adequacy with warranted degrees of commitment; DR withholds unjustified determinations; AR provides a path to resolution where appropriate; RX allows revision or the termination of suspension; and BG governs the boundaries within which these responses apply. The integrative principle emerging from this synthesis is that epistemic commitment should not exceed the strength and scope of its supporting evidence. Nevertheless, this architecture is an interpretation of the argumentative functions found in the corpus, not a pedagogical theory historically formulated by the classical authors themselves. These findings provide the textual basis for the conceptual reconstruction in RQ2, without establishing the psychological mechanisms or educational effectiveness of the proposed contemporary model.

Reconstructing Tawaqquf Pedagogy and Tawaqquf-Based Epistemic Agency (TBEA)

Building on RQ1, the second analytical stage reconstructs the six identified functions into Tawaqquf Pedagogy and the proposed Tawaqquf-Based Epistemic Agency (TBEA) framework for regulating epistemic commitment in GenAI-assisted learning. Integration proceeded through theory-guided integrative comparison, treating classical categories and contemporary constructs as capable of functional comparison without treating them as historically identical. Epistemic Diagnosis (ED) was considered alongside metacognitive monitoring; Evidence-

Commitment Calibration (EC) alongside epistemic vigilance and confidence calibration; Deliberate Restraint (DR) alongside suspension of judgement; Active Resolution/Inquiry (AR) alongside self-regulated inquiry; Revisability and Exit (RX) alongside belief revision and metacognitive control; and Boundary Governance (BG) alongside epistemic agency, scope control and stopping rules. The comparison informs a regulatory architecture linking evidence evaluation, degrees of commitment, conditional restraint or inquiry, revision and the limits of legitimate decision-making, without altering the categories or coding of the classical corpus.

The principal candidate linking mechanism is EC, which relates the quality, strength and scope of evidence to the degree of commitment that this evidence warrants. Whereas epistemic vigilance centres on assessing the credibility of sources, messages and claims, EC specifies the implications of that assessment for the degree of certainty that may justifiably be adopted (Bielik & Krell, 2025; Tanchuk & Taylor, 2025). Within this relationship, ED identifies the epistemic problem, whereas EC determines whether the evidence warrants accepting, restricting or suspending a claim. This distinction provides a more specific account of epistemic agency, understood as active and responsible participation in the formation and use of knowledge (Nieminen & Ketonen, 2024). EC is proposed as a principal candidate mechanism on the basis of its relational function and explanatory capacity, not because it has the highest frequency in the corpus or because causal evidence has already been established.

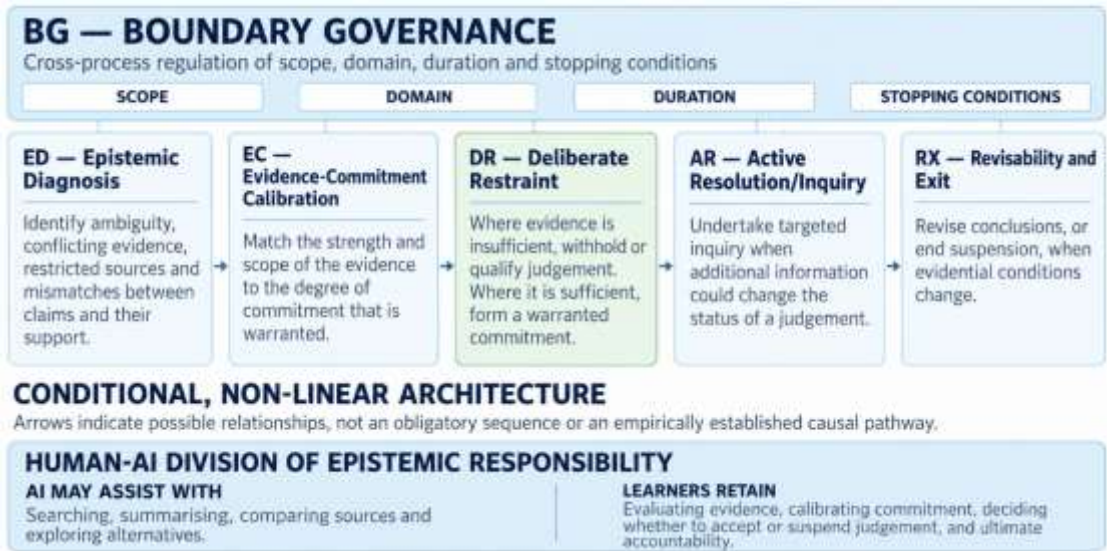
The reconstructed architecture further proposes that DR, AR and RX constitute conditional responses to the relationship between evidence and commitment. DR warrants withholding or restricting judgement when the epistemic grounds are insufficient, consistent with the rationality of suspension of judgement (Vollmer, 2024). However, restraint does not always necessitate further inquiry. AR is employed selectively where additional information could reasonably change the status of a judgement, while RX allows revision or the termination of suspension when evidential conditions change. BG operates across processes, governing the scope of claims, domains of knowledge, the duration of restraint and stopping conditions. This reconstruction retains the negative cases identified in RQ1, particularly U02 and U06, which show that suspension is unnecessary when evidence is sufficient, and U14, which limits prolonged suspension because it may produce *ta'tīl*. Thus, ED-EC-DR/AR-RX, with BG governing the boundaries of the process, is a conceptual shorthand for conditional regulatory relationships rather than a sequence that all learners must follow.

On this basis, TBEA is proposed as learners' capacity to retain authority and responsibility for judgement by diagnosing epistemic problems, calibrating evidence and commitment, deliberately withholding judgement where necessary, undertaking directed inquiry, revising judgements and recognising the limits within which decisions are warranted. TBEA does not replace epistemic agency; rather, it offers a mechanistic specification of how that agency may be developed through human-GenAI interaction (Nieminen & Ketonen, 2024; Wu et al., 2025). The reconstruction also addresses epistemic dependence, especially where technology begins to substitute for learners' evaluative and justificatory activities

(Du & Yuan, 2026). Within TBEA, AI may assist with information searches, summarisation, the organisation of ideas and the exploration of alternatives, while learners continue to develop the capacity to assess evidential adequacy, calibrate certainty and take responsibility for conclusions. This principle is articulated as the human–AI authority proposition: delegating cognitive activities need not erode epistemic agency, provided that authority over evidence calibration and ultimate epistemic accountability remain with humans.

Figure 1.

Conceptual Model of Tawaqquf-Based Epistemic Agency (TBEA): An Architecture for Regulating Epistemic Commitment in GenAI-Assisted Learning.



The synthesis generates seven theoretical propositions linking evidence calibration, legitimate suspension, inquiry, revision, boundary management, the distribution of human–AI authority and the development of epistemic capabilities. As presented in Table 2, these propositions specify relationships for future testing; they do not report empirically confirmed effects.

Table 2. Theoretical Propositions of Tawaqquf-Based Epistemic Agency (TBEA)

Proposition	Theoretical formulation
P1 – Calibration	The more effectively learners align evidential adequacy with degrees of commitment, the less likely they are to form premature epistemic commitments when interacting with GenAI.
P2 – Restraint	Withholding judgement is adaptive when the required commitment exceeds the strength of the evidence, but maladaptive when maintained after the evidence becomes sufficient.
P3 – Inquiry	Productive restraint is likely to be accompanied by directed inquiry when additional information could change epistemic status.
P4 – Revisability	Epistemic agency includes the capacity both to form judgements and to revise them or end suspension as evidential conditions change.
P5 – Boundary	BG regulates scope, domain, duration and stopping conditions so that tawaqquf does not become scepticism or decision paralysis.
P6 – Human–AI Authority	AI may assist with searching for, organising and exploring information without necessarily undermining agency, provided that learners retain responsibility for calibrating commitments and for their ultimate epistemic accountability.

P7 – Formation	Improved performance with AI assistance does not, in itself, establish stronger epistemic capability. TBEA should be evaluated through the quality of learners’ independent judgements and justifications.
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Source: theoretical reconstruction based on Supplementary Table S5. All propositions are provisional and require empirical testing.

Together, the seven propositions specify how regulation of epistemic commitment may connect evidence evaluation with learners’ responsibility in GenAI-assisted learning. Conceptually, this architecture permits acceptance when evidence is adequate, qualification of certainty when evidence is limited, suspension when justification is insufficient, and subsequent revision or an end to suspension as evidential conditions change. The framework’s conceptual contribution lies in integrating these mechanisms within an account of epistemic agency that is sensitive to the boundaries of their application and the distribution of human–AI responsibility. Nevertheless, TBEA is not yet a psychometrically validated construct, and the relationships proposed in P1–P7 have not been tested causally or experimentally. Accordingly, the RQ2 findings provide a basis for instrument development and further pedagogical testing while maintaining the distinction between the textual evidence of RQ1, the theoretical reconstruction of RQ2 and empirical validation in subsequent research.

Discussion

The central theoretical insight is that *tawaqquf* can be interpreted as a conditional architecture for regulating epistemic commitment, rather than simply a requirement to withhold judgement under uncertainty. Its theoretical significance lies in the relationships among evidential adequacy, degrees of commitment, prospects for resolution and the limits within which suspension is legitimate. This interpretation extends discussions of suspension of judgement as an epistemically warranted stance (Vollmer, 2024). More specifically, the reconstruction asks: how to determine a degree of commitment proportionate to the evidence, identify conditions that justify further inquiry and establish when continued suspension is no longer warranted. Addressing these questions requires an interpretation attentive to historical contexts and to the nature of arguments within Islamic intellectual traditions. In theology, *tawaqquf* has limitations if applied as a universal response to undecidable propositions. Conversely, al-Rāzī’s withholding of certainty in arguments concerning the origins of language illustrates that suspension may be justified when the evidence is insufficient to establish one possibility over another. The contrast suggests that the legitimacy of *tawaqquf* depends on the conditions and limits of epistemic justification rather than on uncertainty alone (Ahsan, 2026; Bastani et al., 2025; Malik, 2026). The contribution of this study, therefore, is to reconstruct the functions that regulate epistemic commitment through traceable textual arguments without projecting contemporary educational-psychological constructs onto the historical formulations of classical thinkers.

The framework’s most distinctive proposed mechanism is Evidence–Commitment Calibration (EC), which links assessments of the quality and scope of evidence with the degree of commitment that can be justified. This mechanism

overlaps with epistemic vigilance, which concerns source credibility, message reliability and the conditions under which information is accepted (Bielik & Krell, 2025; Sperber et al., 2010). Yet evaluating reliability does not itself establish how strongly a claim should be believed, whether its scope should be narrowed or when a conclusion should be suspended. EC proposes a more explicit regulatory relationship between evidential assessment and the formation of commitment. Nevertheless, aligning beliefs with evidence is not an entirely new epistemological principle. The originality of Tawaqquf Pedagogy is better understood as integrating this principle with epistemic diagnosis, conditional restraint, selective inquiry, revision and boundary management. EC is therefore a candidate linking mechanism by virtue of its explanatory role, not because coding frequencies establish its priority or because any causal relationship has been demonstrated.

Compared with metacognition and self-regulated learning (SRL), TBEA places more specific emphasis on the legitimacy of forming judgements. Metacognition accounts for the monitoring and control of thinking (Flavell, 1979), while SRL encompasses the regulation of learning goals, strategies, monitoring and reflection (Zimmerman, 2002). AI may support learners' self-regulation, while structured metacognitive support is important for helping learners monitor and reflect on their thinking when using GenAI (Lan & Zhou, 2025; Xu et al., 2025). TBEA complements these perspectives by distinguishing awareness of uncertainty from the capacity to determine its epistemic consequences. A learner may recognise that an answer is uncertain without being able to explain what degree of confidence the evidence warrants. Within this framework, Epistemic Diagnosis (ED) identifies an epistemic problem, while EC regulates its implications for commitment. However, this conceptual distinction does not establish that ED and EC are psychological processes empirically distinct from metacognition or SRL. Whether TBEA adds explanatory value beyond established constructs remains a question for future discriminant-validity testing.

The relationship among Deliberate Restraint (DR), Active Resolution/Inquiry (AR), and Revisability and Exit (RX) clarifies that productive suspension is neither passive doubt nor an obligation to search indefinitely. Within the purposively selected corpus, every unit coded for DR was also coded for RX, while AR appeared in a smaller subset. This is a descriptive coding pattern, not evidence of a temporal pathway. The framework consequently distinguishes two opposing risks: premature epistemic commitment, in which conclusions are formed before adequate justification is available, and unbounded inquiry, in which searching continues without stopping criteria. The negative cases U02, U06 and U14 mark important boundaries: suspension is unnecessary when evidence is sufficient and unjustifiable when it produces *ta'ṭil*. Boundary Governance (BG) therefore regulates the legitimacy of the entire process, rather than constituting a final stage that must always be completed. Evidential adequacy, however, has no universal threshold across all situations. The complexity of a problem, prior knowledge, the consequences of error and acceptable levels of uncertainty must be considered. EC and BG should therefore be understood as context-sensitive regulatory principles, not decision rules that yield the same judgement in every setting.

This distinction becomes particularly important where improvements in GenAI-assisted performance are mistaken for growth in learners' cognitive and epistemic capacities. Although GenAI may enhance learning outcomes and task-completion success, improved performance during technology use does not, in itself, demonstrate meaningful and sustained learning. Indeed, AI assistance without adequate pedagogical support may yield higher performance while it is available but potentially weaken outcomes when learners are required to work independently. This problem is compounded by the risks of metacognitive laziness and dependence on AI outputs, suggesting that the ease of obtaining answers can reduce learner engagement in evaluation and knowledge construction. These risks do not imply, however, that GenAI intrinsically diminishes thinking skills: its effects depend on the design of assistance, task characteristics, the quality of guidance and learners' cognitive engagement (Bastani et al., 2025; Chen & Cheung, 2025; Deng et al., 2025; Fan et al., 2025; Hou et al., 2025; Zhai et al., 2024). TBEA therefore distinguishes the quality of AI-assisted outputs from the quality of learners' independent judgements. The accuracy or quality of AI-assisted answers is insufficient evidence that learners can independently evaluate evidence, calibrate confidence, qualify conclusions and justify them. This distinction grounds P7: the success of GenAI-assisted learning should be assessed not only through the quality of final products but also through the development of epistemic capabilities that learners retain when technological assistance is unavailable.

TBEA does not seek to replace established accounts of epistemic agency; instead, it offers a more focused conceptual specification of how epistemic commitment might be regulated in GenAI-assisted learning. Epistemic agency involves active and responsible participation in knowledge formation and is shaped by assessment practices, social environments and technological interactions. GenAI use nevertheless raises problems of epistemic dependence, particularly when evaluation, justification and decision-making increasingly rely on technology. In this context, cognitive offloading may be augmentative when it helps develop learners' capabilities, but erosive when the cognitive functions intended for development are instead transferred to AI. The crucial issue is therefore less how often learners use technology than whether they retain epistemic authority and accountability for their conclusions (Du & Yuan, 2026; Liu et al., 2026; Nakamura, 2026; Nieminen & Ketonen, 2024; Wu et al., 2025). From this perspective, proposition P6 suggests that delegating exploration, summarisation and the comparison of alternatives to AI can support learning, provided that evaluating evidential adequacy, calibrating commitment and taking responsibility for conclusions remain capabilities developed by learners. The boundary of epistemic delegation is thus determined not merely by the types or number of tasks entrusted to AI but by the evaluative functions that humans must retain. This principle does not demand complete independence from the outset; it allows progressive pedagogical scaffolding as learners develop the capacity to exercise epistemic agency.

For Islamic education, Tawaqquf Pedagogy offers a way of translating classical disciplines of epistemic judgement into learning practices that combine

careful engagement with textual evidence, openness to competing arguments and responsibility for conclusions. Its relevance is particularly evident in learning that involves interpreting texts, comparing scholarly positions or engaging with questions that cannot be resolved through a single rapid answer. For example, when learners use GenAI to compare opinions in Islamic jurisprudence (fiqh), teachers can guide them to identify sources, examine the grounds of arguments, distinguish points of agreement from disagreement and explain the limits of defensible conclusions. This procedure is not intended to position learners as authorities for issuing legal rulings; rather, it develops epistemic caution and awareness of the limits of their competence. In this way, tawaqquf is presented neither as a rejection of technology nor as resistance to differences of opinion, but as a pedagogical framework for avoiding certainty that exceeds the evidence. This is a proposed pedagogical application, not an intervention examined empirically in this study.

Responsibility for strengthening epistemic agency cannot, however, rest solely with individual learners, because the quality of judgement is also shaped by the reliability of the epistemic environment in which knowledge is acquired and evaluated. In GenAI-assisted learning, epistemic trustworthiness requires attention to informational accuracy, source transparency, accountability and inclusivity, especially where learners have limited prior knowledge or limited capacity to verify claims independently (Tanchuk & Taylor, 2025). On this account, implementing TBEA would require pedagogical and institutional support through teacher guidance, traceable evidence and learning environments that encourage critical dialogue and reasoned justification. Possible practices include evaluating evidential adequacy before accepting claims, assessing the quality of learners' justifications and reflecting on changes in confidence as evidence develops. Excessive verification requirements, however, may increase cognitive load and reduce learning efficiency, while overly permissive stopping criteria may reinforce premature epistemic commitment. BG is thus intended to balance evidential rigour, efficient inquiry and the readiness to make defensible decisions. Accordingly, TBEA emphasises not only individual epistemic responsibility but also the need for pedagogical conditions that allow such agency to develop proportionately.

The preceding implications should be read in light of the study's design and evidential limits. The classical corpus was purposively selected, so the six functions identified cannot be generalised as a comprehensive representation of Islamic intellectual traditions. Category co-occurrence provides descriptive evidence of coding patterns, not proof of causal mechanisms or psychological sequences. Moreover, the coding has not undergone independent expert audit, and neither TBEA nor propositions P1–P7 have been subjected to psychometric or experimental testing. Future research should develop operational indicators for the six functions, examine their discriminant validity relative to metacognition and SRL, and evaluate EC's proposed status as a linking mechanism. Think-aloud designs, process tracing, human–AI learning experiments and longitudinal studies could assess confidence calibration, quality of justification, revisability, learning transfer without AI and the risks of excessive suspension. Accordingly, the

contribution is a testable conceptual framework for investigating the relationships among evidence, commitment and epistemic agency, not evidence that Tawaqquf Pedagogy has already reduced epistemic dependence.

CONCLUSIONS

Analysis of the selected classical Islamic corpus suggests that tawaqquf is more than suspension of judgement: it can be interpreted as a conditional and non-linear means of regulating epistemic commitment. Analysis of 25 argumentative units drawn from seven works by six authors identified six epistemic functions: Epistemic Diagnosis (ED), Evidence-Commitment Calibration (EC), Deliberate Restraint (DR), Active Resolution/Inquiry (AR), Revisability and Exit (RX), and Boundary Governance (BG). The RQ1 findings indicate that the legitimacy of a judgement depends on relationships among evidential adequacy, degrees of commitment, possibilities for resolution and boundaries of application. EC was identified as a candidate linking mechanism between evidential status and the warranted degree of commitment, while BG governs the scope, conditions and limits of legitimate suspension. These relationships derive from interpretative synthesis and should not be read as empirically established causal mechanisms.

To address RQ2, the study develops Tawaqquf Pedagogy and the proposed Tawaqquf-Based Epistemic Agency (TBEA) framework, integrating evidential diagnosis, commitment calibration, proportionate restraint, selective inquiry, revision and boundary management in GenAI-assisted learning. Its originality lies in specifying the mechanisms connecting evidence evaluation with the formation of epistemic commitment, rather than claiming to have discovered an entirely new epistemological principle. Seven theoretical propositions outline how GenAI-assisted learning might be designed without displacing learners' ultimate responsibility for evaluating and justifying claims.

This contribution remains limited by the purposively selected corpus, the interpretative nature of the coding, the absence of an independent expert audit and the lack of empirical validation of TBEA. Future research should test the validity of the six functions, EC's role as a linking mechanism and the effectiveness of pedagogical interventions in improving the quality of justification, confidence calibration and epistemic independence. Ultimately, the proposed value of Tawaqquf Pedagogy is not to cultivate doubt for its own sake, but to strengthen learners' capacity to accept claims when the evidence is sufficient, withhold judgement when justification is inadequate and revise their conclusions when the evidence changes.

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