

Pedagogical Innovation in Islamic Education: A Conceptual SMART-Islami Framework Informed by Singapore's aLIVE Programme

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Abstract

This study aims to develop SMART-Islami, a conceptual pedagogical framework for reconstructing smart education within Islamic epistemology. Smart-education models have explained the integration of intelligent technologies and adaptive pedagogy, but they have not sufficiently clarified what educational “intelligence” should ultimately serve, particularly in Islamic education, where the formation of *iman*, *akhlaq*, and *adab* is central. Using Singapore's aLIVE (Learning Islamic Values Everyday) programme under the Islamic Religious Council of Singapore (MUIS) as an instrumental case, this study analysed a bounded corpus of nine primary documents published between 2014 and 2026. The documents included MUIS programme and policy publications, Singapore education-policy and data-protection documents, and independent peer-reviewed studies of aLIVE. Data were examined through directed content analysis based on the three elements of smart education and the five characteristics of smart learning, followed by conceptual synthesis. The findings show that aLIVE's documented strengths are mainly reflected in value modelling and community-based instruction, while differentiated instruction, learning analytics, and personalised learning pathways are not clearly evidenced in the analysed documents. These are reported as documentary gaps rather than confirmed gaps in practice. SMART-Islami reinterprets the five characteristics of smart learning through a specified *Maqasid al-shari'ah* formulation and presents a six-stage implementation model from teacher-and-curriculum input to character formation. As a conceptual proposition, the framework requires empirical validation through a single-centre design-based pilot using measurable character-formation indicators.

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Introduction

Two decades of digital reform have not settled a basic question for religious education: when instruction is mediated by intelligent technologies, what are those technologies for? In general education this question is often answered by appeal to efficiency, engagement, or measurable achievement (Holmes & Tuomi, 2022; Zhu et al., 2016). Islamic education cannot answer it that way. Its purpose is the formation of *iman*, *akhlaq*, and *adab*, so any pedagogical innovation is judged first by whether it strengthens that formation, not by whether it accelerates content delivery (Halstead, 2004). The terms at issue are related but not equivalent, and are used precisely throughout. Digital transformation denotes the system-level reorganisation of educational provision around digital infrastructure; artificial intelligence denotes computational systems that perform tasks such as adaptation, recommendation, or content generation; and smart education denotes a pedagogical paradigm the interaction of smart learners, smart pedagogy, and smart environments that may draw on artificial intelligence but is not reducible to it (Hwang, 2014; Zhu et al., 2016). This study concerns

smart education in that pedagogical sense; artificial intelligence enters only as one possible enabler within the smart environment. The specific problem this article addresses follows directly: the dominant models of technology-rich instruction smart education, TPACK, SAMR, and the emerging responsible-AI guidelines describe *how* to integrate technology but remain silent on the normative source that should govern what the integration is for in a religious setting. That silence matters pedagogically, because without it teachers and curriculum designers in Islamic education have no principled basis for accepting one technological practice and rejecting another.

To make that problem tractable, this article treats five bodies of scholarship as a single analytical architecture rather than as parallel literatures to be summarised in turn. Smart education supplies the pedagogical structure to be reinterpreted. That structure has two components with distinct origins, and their relationship is stated rather than assumed. The three-element model of smart education smart learners, smart pedagogy, and smart environments derives from Zhu et al. (2016), where the smart learner is defined through four ability levels (basic knowledge and core skills, comprehensive abilities, personalised expertise, and collective intelligence). The five characteristics of smart learning self-directed, motivated, adaptive, resource-enriched, and technology-embedded derive from an earlier policy formulation (MEST, 2011, as cited in Zhu et al., 2016). The two are linked in this study as level and attribute: the three elements specify where pedagogical work occurs (in the learner, the pedagogy, or the environment), while the five characteristics specify qualities that smart learning should exhibit across those elements. SMART-Islami reinterprets the five characteristics and re-anchors the three elements to Islamic aims; treating the characteristics as attributes of the smart-learner element is the conceptual bridge the original literature leaves implicit. Islamic educational epistemology supplies the aim that governs the reinterpretation, namely knowledge as a means of cultivating *adab*, faith, and moral responsibility (Halstead, 2004; Tan, 2014). *Maqasid al-shari'ah* supplies the decision criterion that translates that aim into concrete pedagogical judgements. Character and moral education supply the learner outcomes against which the framework is assessed. Responsible-AI scholarship supplies the boundary conditions privacy, transparency, human oversight within which any technology must operate (Nguyen et al., 2023; UNESCO, 2021). These are related as aim, criterion, structure, outcome, and constraint; the framework developed below is the mechanism that connects them.

Two clarifications about the Islamic-educational side of this architecture are needed before proceeding, because Islamic education is not a single, uncontested tradition. First, the concepts drawn on here occupy different conceptual levels and are not interchangeable. *Maqasid al-shari'ah* is a higher-order framework of purposes; *taqwa* and *akhlaq* are dispositional outcomes that a *maqasid* orientation seeks to cultivate; *adab* is a relational and ethical comportment governing how knowledge is sought and transmitted; *niyyah* is the intentional condition of the learner; and sanad denotes the chain of scholarly authority that authenticates religious knowledge. Treating these as one undifferentiated value set would obscure how the framework actually reasons. Second, there is genuine interpretive diversity within Islamic educational thought regarding both the content of *maqasid* and the weighting of these concepts. This article does not claim to represent that diversity exhaustively. It adopts a purposes-based reading in the Ghazalian and *maqasid* tradition, in which the formation of a morally responsible human being is the ultimate aim of education (Al-Ghazali, n.d.; Halstead, 2004), and justifies that choice on the ground that this tradition is the one most directly concerned with the relation between knowledge, character, and pedagogy the relation at issue when

technology enters the classroom. A further distinction runs through the whole argument and should be made explicit: some of these concepts function as normative-theological premises and others as pedagogical claims that could, in principle, be empirically examined. That knowledge should serve the formation of a good human being, that sincere intention (*niyyah*) is a condition of beneficial knowledge, and that *adab* governs the teacher–student relation are normative premises grounded in the tradition (Al-Ghazali, [n.d.](#); Halstead, [2004](#)). That differentiated instruction sustains engagement, that reflection supports self-regulation, or that teacher modelling shapes conduct are pedagogical claims open to evidence (Adhya & Panda, [2026](#)). Operationally, the framework separates them by role: the normative premises set the aims and the admissibility criteria for any practice, while the pedagogical claims describe mechanisms whose effectiveness the proposed empirical validation would test. Where a term such as “beneficial knowledge” (*‘ilm nafi*) carries both senses, it is used here for its normative force and is not treated as an already-measured outcome.

Claims that no adequate framework yet exists should be made cautiously, because such claims often reflect selective reading. A structured comparison is therefore warranted before asserting a gap. Recent scholarship has produced *maqasid*-based governance frameworks for AI in Islamic higher education (Atallah, [2026](#)), *maqasid*-based evaluative frameworks for the digitalisation of Islamic education (Sanusi, [2025](#)), and general responsible-AI and values-sensitive principles applicable across education (Nguyen et al., [2023](#); UNESCO, [2021](#)). Each addresses a real need: governance, evaluation, and universal ethical principle respectively. What none of them supplies is a programme-level pedagogical model that specifies how personalisation, adaptivity, and learning analytics are to be reconstructed and enacted in the ordinary work of teaching within a concrete Islamic education setting. The gap this article claims is thus narrow and specific an operational, classroom-facing pedagogical model rather than a sweeping absence. The comparator frameworks named here and in the Discussion were not selected impressionistically: they were identified through the structured literature search reported in the Method (search locations, terms, and dates in the corpus and search-strategy subsection), retaining peer-reviewed frameworks that explicitly address *maqasid al-shari’ah*, Islamic education, or responsible AI in education. That the comparison is bounded to this set is itself a limitation, revisited in the Discussion; the claim is not that no related model exists several do but that none occupies the specific programme-level pedagogical position SMART-Islami takes.

Singapore offers an instructive setting for examining this gap, though the reasons for selecting it require scrutiny rather than assertion. As a city-state with an established Muslim-minority community, Singapore delivers Islamic education through a small number of full-time madrasahs and, far more widely, through part-time mosque-based programmes attended by children who otherwise study in national schools. The aLIVE (Learning Islamic Values Everyday) programme, serving Muslims aged five to twenty under MUIS, is an appropriate instrumental case not merely because it is well documented and accessible but because it is theoretically revelatory: it combines an explicit, value-formation-centred pedagogy with a national policy environment that actively promotes smart education, so the tension this article examines between technological intelligence and moral formation appears in an unusually sharp and observable form. A programme without that policy pressure, or without an articulated value pedagogy, would make the tension harder to see. Its focus on everyday value formation thus makes it a demanding test of whether a smart-education framework can be adapted without losing its Islamic character (Majlis Ugama Islam Singapura,

2026a, 2026b). At the same time, the very features that make aLIVE revelatory bound its transferability: it is a Muslim-minority, mosque-based, part-time, volunteer-supported programme within a distinctive Singaporean policy regime. Findings and design implications may transfer poorly to Muslim-majority state systems, full-time madrasah education, or settings with different governance, resourcing, or theological traditions, and the framework should be read as calibrated to the minority, community-based context rather than as universally portable. It must be acknowledged that aLIVE was selected in part because prior documentary and empirical work reports comparatively strong value-based pedagogy and institutional support (Syafri et al., 2022). This is a form of positive-case selection, and it bounds the claims that follow: the case demonstrates how the framework can be articulated where conditions are relatively favourable, not how it would fare in programmes with weaker governance, fewer resources, or different theological orientations. The Discussion returns to this limitation and to how the framework might change under less favourable conditions.

This article pursues three linked objectives, each tied to a distinct research question, method, and output, so that evidence is transferred across levels without circular reasoning. The first objective is conceptual: to reformulate smart education as a pedagogical innovation consistent with the aims of Islamic education (RQ1), addressed through conceptual synthesis of the smart-education and Islamic-education literatures and yielding the SMART-Islami framework. The second is case-analytic: to assess the conceptual fit between aLIVE's documented pedagogical characteristics and such a framework (RQ2) a documentary and conceptual assessment, not an empirical test of applicability or effectiveness, since no implementation or outcome data are presented addressed through directed content analysis of the corpus and yielding the mapping in Table 1. The third is design-oriented: to specify an instructional model and implementation strategy for technology-enabled pedagogical innovation in Islamic education (RQ3), addressed through design-oriented synthesis and yielding the implementation model and protocol. The conceptual result constrains the case analysis, and the case analysis disciplines the design; the design claims no empirical warrant beyond what the documentary evidence supports.

Method

This is, in the first instance, a framework-development study. It proceeds through a documentary instrumental case study, but its epistemic aim is theory-building rather than description of the case or evaluation of its outcomes (Stake, 1995; Yin, 2018). The three components stand in a definite sequence with distinct epistemic status. Document analysis establishes what can be said about the case from available evidence (descriptive, evidentiary). Directed content analysis maps that evidence onto smart-education categories (interpretive, structured by prior theory). Conceptual synthesis integrates the mapping with Islamic educational epistemology to construct the framework (generative, theory-building). Naming the sequence explicitly guards against the methodological incoherence that a hybrid label can otherwise invite: the case is an instrument for developing theory, and the framework's status is that of a reasoned proposition, not a validated finding. The design can be stated precisely. The bounded case is the aLIVE programme as represented in its public documentary record. The unit of analysis is the programme's pedagogical design its stated learner aims, its pedagogy, and its learning environment not individual classrooms, teachers, or learners, which the documents do not reach. The temporal boundary runs from 2014, the earliest scholarly analysis of Singapore's Islamic-education reform drawn on here (Tan, 2014), to 2026, the date of the

most recent MUIS and policy publications consulted. Within this design each method performs a distinct function: the instrumental case study bounds and frames the object; document analysis extracts and verifies evidence about it; directed content analysis classifies that evidence against prior theory; and conceptual synthesis generates the framework. Each function takes the previous one's output as its input, which is what makes the integration sequential rather than merely additive.

The corpus was assembled through a defined sampling frame rather than by appeal to "extensive" evidence. Inclusion criteria were: (a) documents issued by MUIS concerning the aLIVE programme, including programme descriptions, curriculum information, media releases, and annual reporting; (b) Singapore government publications on educational digital transformation relevant to the policy context; and (c) peer-reviewed scholarship on smart education, Islamic pedagogy, curriculum innovation, educational technology, character education, and responsible AI, published up to the point of analysis. Documents were excluded where they were not publicly retrievable, were duplicative, or bore no analytical relevance to the SMART characteristics or to the aLIVE case. The corpus is bounded and modest: it comprises the publicly available MUIS aLIVE materials, a small set of Singapore policy documents, and the peer-reviewed works listed in the references. Because the programme's documentary footprint is finite, corpus adequacy is claimed on the basis of coverage of the relevant public record rather than thematic saturation in the interview-study sense; the boundary of that record is itself part of the finding, since much of what a full pedagogical evaluation would need is simply not documented publicly.

The search itself is reported here so that it can be reproduced. Case documents were retrieved from MUIS official platforms (muis.gov.sg and the LearnIslam portal, learnislam.sg) and from Singapore government portals (moe.gov.sg, smartnation.gov.sg, pdpc.gov.sg). Scholarly literature was located through Scopus, Web of Science, and Google Scholar. Search terms combined programme identifiers ("aLIVE", "Learning Islamic Values Everyday", "Islamic education Singapore", "madrasah Singapore") with conceptual terms ("smart education", "smart learning", "*maqasid* digital education", "Islamic education artificial intelligence", "character education technology"). The date range was 2014–2026; retrieval was completed in August 2026. Language was restricted to English and Indonesian, the latter to include the Indonesian-language study of aLIVE by Syafri et al. (2022). Inclusion and exclusion criteria were as stated above; duplicate records returned across databases were consolidated to a single entry; and each document was appraised for quality by provenance (official issuing body versus third-party), peer-review status, and direct relevance to the aLIVE case or to the analytical categories. Nine primary documents met these criteria and constitute the case corpus subjected to document analysis and directed content analysis; the broader peer-reviewed literature (smart-education theory, *maqasid* and Islamic-education scholarship, responsible-AI and methods texts) forms the conceptual base used to construct categories and to synthesise, and is not treated as evidence about aLIVE. Appendix A lists every primary document with its issuing body, year, type, relevance, and role in the analysis.

Two limitations of the source base were treated as analytic issues rather than glossed over. First, official documents privilege institutional intentions and success narratives; MUIS materials describe aims and provision, not independently measured outcomes. The analysis therefore separated documented aims and structures from any claim about educational effects, and, where possible, read official materials against independent scholarship on the programme and on Singapore's Islamic education more broadly (Syafri et al., 2022; Syafri & Budin, 2025; Tan, 2014).

Where independent corroboration was unavailable, claims were marked as institutional self-report and not treated as evidence of effectiveness. Second, source authority varies across the corpus; policy documents, peer-reviewed studies, and programme webpages were weighted accordingly, and provenance was recorded for each analytical conclusion.

The analysis proceeded in three stages. Documentary materials were first examined to identify content relevant to aLIVE's pedagogy and provision (Bowen, 2009). Directed content analysis then coded that content against two predetermined category sets the three pillars of smart education and the five SMART characteristics (Hsieh & Shannon, 2005; Zhu et al., 2016). Because directed coding can force a case into pre-existing categories, the coding frame was kept open to emergent and disconfirming evidence: passages that fitted no SMART category, and passages that appeared to contradict a category's expectations, were logged separately and reviewed. This process revised the initial reading in one respect worth reporting: several institutional indicators initially coded as evidence of "smart environment" readiness (funding, centre growth, home-based resources) were reclassified as context rather than as pedagogical evidence, because they document capacity, not personalisation or analytics. Conceptual synthesis then integrated the mapping with Islamic educational epistemology and a *maqasid* orientation to construct SMART-Islami (Jaakkola, 2020). The coding framework was operationalised rather than left as an abstract procedure. Each category was given an inclusion definition and anchored to indicative text; coding proceeded by assigning documentary segments to a pillar and, where applicable, a SMART characteristic, and by recording the synthesis decision that followed. Appendix B provides worked examples of this chain text segment, assigned code, category, and synthesis decision including one emergent case in which evidence did not fit the directed categories and was reclassified. Given the bounded size of the corpus, Coding was conducted manually using Microsoft Excel as a spreadsheet-based coding matrix rather than dedicated qualitative-analysis software. Where a segment admitted more than one classification, the disagreement was resolved by returning to the source text and, if it remained indeterminate, the more conservative assignment was retained and the ambiguity logged.

Trustworthiness was pursued through more than triangulation and an audit trail, though both were maintained: every analytical conclusion was linked to a documented source, and interpretation was cross-checked across official, scholarly, and policy sources (Bowen, 2009; Creswell & Poth, 2018). Beyond this, the study records its reflexive position the authors approach the case from within a *maqasid*-oriented reading of Islamic education, which shapes what counts as a pedagogically salient feature and notes the procedures used to manage interpretive ambiguity: coding disagreements were resolved by returning to the source text and, where the text was indeterminate, the weaker interpretive claim was retained. Dependability rests on the explicit sampling frame and coding sequence, which make the analytic path reconstructable; confirmability rests on the source-linked audit trail. That audit trail is not merely asserted: it comprises the spreadsheet coding matrix, the specific source citation attached to every analytical conclusion, and a memo record of the synthesis decisions summarised in Appendix B. Coding was conducted by the first author and independently checked by a second author, with disagreements resolved by discussion against the source text. Researcher positionality familiarity with, and a normative commitment to, a *maqasid*-oriented reading of Islamic education was managed by requiring every interpretive claim to cite a specific source and by deliberately retaining negative or contradictory evidence rather than discarding it; the reclassification of capacity indicators from pedagogical evidence to context is the clearest instance of

such disconfirming evidence being kept in view. These procedures raise credibility but do not substitute for empirical validation. Because the study rests entirely on documentary evidence, SMART-Islami remains a conceptual model requiring validation through classroom implementation, teacher participation, and learner evaluation. Its findings should be read as a theoretically grounded pedagogical proposition, not as evidence of instructional effectiveness.

Result and Discussion

Result

The findings come in three parts: the institutional context of Islamic education in Singapore, how aLIVE's existing pedagogical characteristics map against the three pillars of smart education, and the SMART-Islami framework that mapping produces, along with its implementation model.

Context: Islamic Education in Singapore and the aLIVE Programme

Islamic education in Singapore runs along two tracks. Full-time madrasah education combines religious and academic curricula but is limited in number and closely regulated. Part-time Islamic education, delivered in mosques for Muslim children who attend national schools during the week, is far more common. Tan (2014) characterises Singapore's Islamic-education reform as a continuing effort to balance relevance against the preservation of religious identity. The regulatory status of madrasah education and the existence of the Smart Nation programme and the EdTech Masterplan 2030 are documented policy facts (Ministry of Education Singapore, 2023; Smart Nation and Digital Government Office, 2018; Tan, 2014). The further claim that these initiatives shape families' expectations of religious instruction even though mosque programmes fall outside the Ministry of Education's direct authority is interpretive: it is offered as a reasoned reading of the policy context, not as a measured effect, since no survey or interview evidence of such expectations is presented in this documentary study.

aLIVE (Learning Islamic Values Everyday) is a mosque-based initiative under MUIS intended to nurture pious, righteous, and socially conscious young Muslims (Majlis Ugama Islam Singapura, 2026c). It is organised into four age bands spanning five to twenty years and centres on faith, worship, character education, Islamic civilisation, and Qur'anic literacy; during the pandemic it introduced home-based learning resources (Majlis Ugama Islam Singapura, 2026a, 2026b). Two categories of evidence must be kept distinct here. The programme's stated aims and structures age-tiered curriculum, value-oriented instruction, community participation are documented in MUIS materials and in independent study (Syafri et al., 2022). Its educational outcomes are not established by the same sources. Reported figures on provision Islamic Education Fund support of more than SGD 10.2 million reaching roughly 37,000 beneficiaries by 2021, and growth from five pioneer centres to fifteen aLIVE centres by academic year 2022 under a strengthened governance office (Majlis Ugama Islam Singapura, 2021) evidence institutional capacity and reach. They do not, by themselves, establish character formation, adaptability, or readiness for smart education, and are read here as context. On the available record, aLIVE possesses much of the institutional foundation smart education presumes, but the public documents do not show that foundation organised into a pedagogical design linking personalised learning, adaptive pedagogy, and ethically governed technology.

Mapping aLIVE Against the Three Pillars of Smart Education

Cross-analysis of aLIVE against the three pillars, summarised in Table 1, yields a consistent reading, stated here with appropriate caution because documentary sources capture formal provision far better than the informal practice of teachers. On the smart-learner pillar, the documents evidence a value-practice orientation and age-tiered progression; they do not evidence personalised learning pathways or technology-supported collective intelligence. On the smart-pedagogy pillar, the documented emphasis on modelling and habituation is consistent with collaborative learning, but the public record contains no indication of differentiated, data-informed instruction. On the smart-environment pillar, the home-based learning introduced during the pandemic shows early context-awareness and anywhere-access, without documented learning analytics or adaptive interaction of the kind mature smart learning environments require (Hwang, 2014).

Table 1 marks, for each entry, whether it is directly documented, inferred from the absence of documentation, or proposed by the authors as a development opportunity, so that observation, gap, and recommendation are not conflated

Table 1. Mapping of the aLIVE Programme against the Three Pillars of Smart Education

Smart-education pillar	Documented in sources (evidence status)	Not evidenced in sources (gap type)	Proposed development opportunity
Smart Learner	Value-practice orientation; age-tiered progression (documented: MUIS programme materials; Syafri et al., 2022)	Personalised learning pathways; digital collective intelligence (inferred from documentary absence)	Adaptive learner profiles keyed to interest and developmental stage (authors' proposal)
Smart Pedagogy	Modelling, habituation, collaborative instruction (documented: MUIS materials)	Differentiated, data-informed personalisation (inferred from documentary absence)	Blended design: high-value face-to-face core with online reinforcement (authors' proposal)
Smart Environment	Home-based learning resources: video, quizzes (documented: MUIS, 2026a, 2026b)	Learning analytics; adaptive interaction (inferred from documentary absence)	Character-growth feedback with privacy-respecting, consent-based data practices (authors' proposal)

Entries under “Not evidenced in sources” denote an absence in the public documentary record, not a demonstrated absence in programme practice. They are documentation gaps: a programme may personalise informally or keep undocumented data practices. Such entries should be read as identifying where corroborating classroom evidence is needed, not as findings that the practice is missing.

Read cautiously, the mapping suggests that aLIVE's documented strengths lie in character education through modelling and community, while personalisation and analytics are the areas the public record does not evidence. This should not be overstated as a clean inverse relationship in which the programme is strong precisely where technology is weak and weak precisely where technology is strong. Documentary sources under-record informal personalisation, individual teacher judgement, and any data practices that are not formally reported; the absence of evidence is

not evidence of absence. What can be claimed is narrower: the design opportunity lies in connecting differentiated learning, ethically governed analytics, and continuing value formation across classroom and home into a coherent instructional design, without displacing the modelling-and-community practice the documents do record. That is the specific problem SMART-Islami is built to address.

The SMART-Islami Framework

Building on this mapping, the study develops SMART-Islami. It retains smart education's three pillars but re-anchors them to the aims of Islamic education, on the principle that technological innovation should be goal-preserving: technology should deepen how values are internalised rather than become an end in itself. To meet the objection that renaming is not reform, each SMART characteristic is specified not merely by an Islamic gloss but by four elements that together change pedagogical practice: a decision rule that tells a teacher what to do differently, the instructional practice it licenses, the learner process it is expected to produce, and an assessable outcome. Table 2 sets these out. The derivation of each component is made auditable in Appendix C, a source-to-construct traceability matrix that links every SMART-Islami element to the specific documentary finding or theoretical proposition that produced it, so that the framework rests on a visible evidentiary chain rather than on narrative assertion alone.

Consider two characteristics in detail. *Adaptive* is reinterpreted through the principle of graduated instruction suited to readiness. Its decision rule is that difficulty and support are adjusted to a learner's spiritual and cognitive readiness rather than to a fixed syllabus pace; the licensed practice is levelled Qur'anic-literacy pathways and tiered tasks; the expected learner process is sustained engagement at an appropriate level of challenge; the assessable outcome is measured progression along a defined literacy or character sequence. This is a different instructional decision from the age-band progression aLIVE currently documents, which advances by cohort rather than by individual readiness. *Technology-embedded* is reinterpreted as *adab*-conscious integration. Its decision rule is that a technological practice is admitted only if it preserves the teacher's exemplary role and the *adab* of the learning relationship, and rejected otherwise; the licensed practice is blended learning in which face-to-face teaching carries value transmission and digital tools carry reinforcement; the expected learner process is that pupils encounter the teacher as moral exemplar while using digital resources for practice; the assessable outcome is that digitally supported tasks demonstrably feed back into teacher-led formation rather than substituting for it. Here the decision rule does real work, because it can reject a technology an autonomous AI tutor delivering religious content without teacher mediation that a neutral smart-education model would accept as an efficiency gain.

This positioning distinguishes SMART-Islami from adjacent *maqasid*-based work. Atallah's (2026) *maqasid*-based AI-governance framework operates at the level of institutional governance in higher education, Sanusi's (2025) *maqasid*-based framework is evaluative. SMART-Islami operates at programme level and stays anchored to a concrete case, complementing governance and evaluation with pedagogy. Where most smart-education models place technological intelligence first, SMART-Islami begins from Islamic educational epistemology, making the paradigm pedagogy-centred rather than technology-centred (Halstead, 2004; Syafri et al., 2026; Zhu et al., 2016).

A point of conceptual precision is required regarding *maqasid*. The framework does not treat *Maqasid al-shari'ah* as a synonym for *taqwa* and *akhlaq*; these are not interchangeable. *Maqasid al-*

shari'ah is used here in the widely cited five-purposes formulation the preservation of religion (*din*), life (*nafs*), intellect (*'aql*), lineage (*nasl*), and property (*mal*) read for its educational implications rather than its juridical ones. On this reading, the preservation and cultivation of *din* and *'aql* furnish the higher purposes; *taqwa* (God-consciousness) and *akhlaq* (moral character) are the dispositional outcomes through which those purposes are realised in a learner. The framework's core outcomes are thus *derived from* a specified *maqasid* formulation, not equated with it: pedagogical decisions are referred to the purposes, and their success is read in the dispositions those purposes are meant to form.

Within SMART-Islami, the smart learner is defined by the integration of knowledge, practice, and *adab*: foundational knowledge as faith, worship, and Qur'anic literacy; comprehensive ability as contextual reasoning; personal expertise as reflective religious practice; and collective intelligence as *ta'awun*, cooperation in doing good (Halstead, 2004; Zhu et al., 2016). Because terms such as contextual reasoning, reflective religious practice, and *ta'awun* are too abstract to test as they stand, Appendix D defines each as a construct with at least one observable indicator suitable for the proposed empirical validation, so that the smart-learner dimension can be assessed rather than only described. Smart pedagogy brings differentiated instruction, collaborative learning, and personalised guidance together with Islamic teaching traditions: differentiation responds to varied cognitive and prior-learning readiness assessed from demonstrated learning such as Qur'anic-literacy level, not from any attempt to profile a learner's inner spiritual state collaboration draws on *halaqah* and *musyawarah*, and personalisation keeps the teacher–student relationship central to moral formation. Blended learning is the fitting delivery mode, with face-to-face teaching as the main channel for value transmission and digital tools handling reinforcement and personalisation (Mishra & Koehler, 2006; Puentedura, 2013).

The smart environment centres on value-sensitive context awareness, ethically governed learning analytics, and adaptive interaction. Learning analytics can support character development and Qur'anic literacy through targeted feedback, provided learner data is handled according to *amanah*, privacy, transparency, and parental consent requirements that carry particular weight given the young age of many participants ((Personal Data Protection Commission Singapore, 2021).

Because these analytics concern minors, the framework specifies a data-governance protocol rather than resting on a general appeal to ethics. Data minimisation limits collection to the small set of indicators a pedagogical decision actually requires. Parental consent is informed and opt-in, obtained and renewable in line with applicable guidance (Personal Data Protection Commission Singapore, 2021). Access control assigns data to named roles on a least-privilege basis. Retention is time-bounded, with a defined deletion schedule at the end of each learning cycle. Contestability allows learners and parents to see, question, correct, or withdraw a learner's data. Human oversight keeps every consequential judgement with the teacher; analytics inform decisions, they do not make them. Profiling a learner's inner "spiritual stage" is excluded on this account as both ethically hazardous and epistemically unwarranted a learner's inner state is not a proper object of programme data so any differentiation is keyed to demonstrated learning rather than to inferred piety. Table 2 and Figure 1 set out how the SMART characteristics connect to the aims of Islamic education, with the *maqasid* orientation expressed in the dispositions of *taqwa* and *akhlaq* at the core.

Table 2. The SMART-Islami Model: Decision Rules, Practices, Learner Processes, and Assessable Outcomes (Illustrative Design Propositions)

SMART-Islami principle	Teacher decision rule	Illustrative practice	Outcome / evidence
Self-directed → mas'uliyah	Require learners to take ownership of value-based tasks rather than merely complete them.	Digital reflection journal on everyday value practice.	Quality and consistency of learner reflection.
Motivated → niyyah	Frame learning around purpose and intention before content.	<i>Sirah</i> and moral narratives linked to learning purposes.	Learner-articulated reasons for practice.
Adaptive → readiness-based instruction	Adjust difficulty and support to individual readiness rather than cohort pace.	Levelled Qur'anic-literacy pathways and tiered tasks.	Progression along defined literacy/character sequences.
Resource-enriched → verified Islamic resources	Curate authoritative sources rather than simply aggregate digital materials.	Curated digital library of <i>sirah</i> , video, and trusted texts.	Appropriate use and discrimination among sources.
Technology-embedded → <i>adab</i> -conscious integration	Use technology only when it preserves teacher guidance and <i>adab</i> .	Blended learning that retains face-to-face teacher formation.	Evidence of teacher-guided rather than tool-substituted learning.
Goal-preserving → human-in-the-loop	Require human/authority validation of AI-assisted materials and refer technological choices to <i>maqasid</i> .	Teacher or Islamic-authority review before AI-assisted content is used.	Documented provenance and validation.

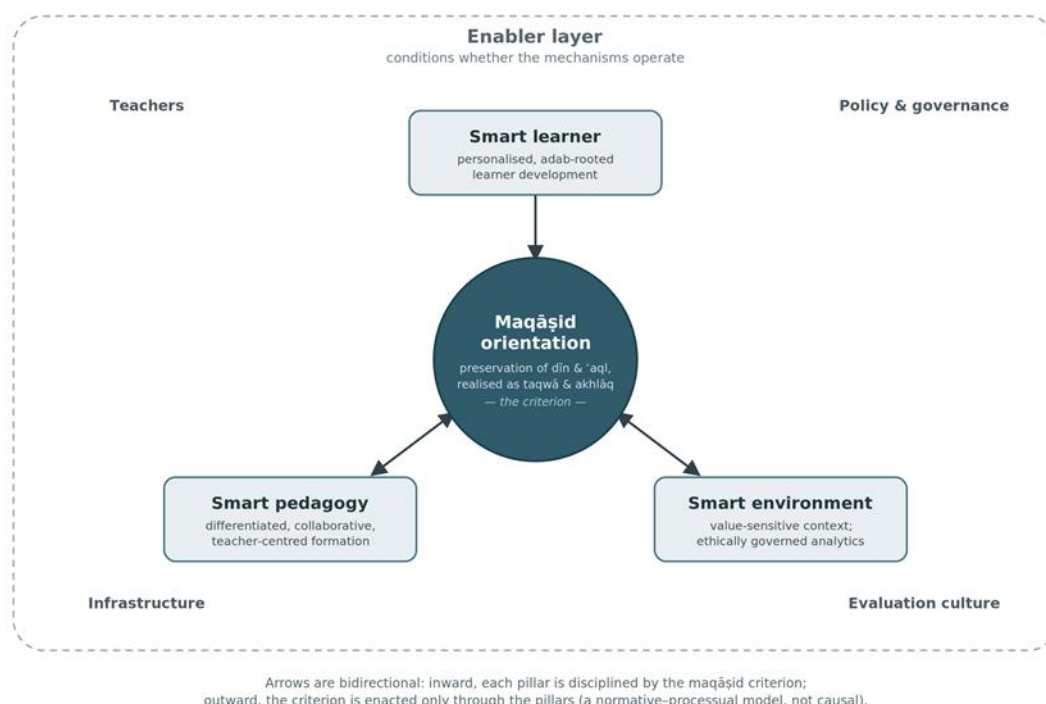


Figure 1. The SMART-Islami framework as an explanatory model.

A *maqasid* orientation preservation of *din* and *'aql*, realised as *taqwa* and *akhlaq* functions as the criterion at the core. The three re-read pillars (smart learner, smart pedagogy, smart environment) are the mechanisms through which that criterion acts on practice; arrows run inward (each pillar is disciplined by the *maqasid* criterion) and outward (the criterion is enacted only through the pillars). An outer layer of enablers (teachers, policy, infrastructure, evaluation culture) conditions whether the mechanisms operate. The model is normative-processual rather than causal: it specifies what should govern pedagogical decisions and how the pillars interact, not a predicted quantitative effect.

The enabler layer named in Figure 1 is defined as follows: teachers, whose formation and readiness carry the model; policy, the institutional and national mandates that authorise or constrain practice; infrastructure, the devices, connectivity, and platforms available; and evaluation culture, the practices through which the programme reviews and improves its own work. Each enabler conditions whether the three mechanisms smart learner, smart pedagogy, smart environment can operate at all, which is why Figure 1 places them as the outer layer rather than inside the core.

Taken together, the three dimensions position SMART-Islami as an extension of existing Islamic pedagogical traditions through the deliberate use of digital technology, with *taqwa*, *adab*, and holistic human development as the governing purpose (Halstead, 2004; Zhu et al., 2016).

Implementation Model and Practical Application

Turning the framework into classroom practice requires an implementation model. Figure 2 presents a six-stage cycle, but the sequence alone would resemble a generic instructional-design loop; what makes it distinctive to SMART-Islami is stated explicitly, together with the feedback and adaptation the earlier version left implicit. Input (teacher, curriculum, learner profile) sets the starting point. The teaching process converts it into a differentiated, *adab*-centred strategy. Digital support supplies resources, personalised pathways, and analytics that assist rather than replace the teacher. Learning activities reflection journals, halaqah discussion, service projects are the tasks through which learners practise the SMART-Islami characteristics. Assessment captures both knowledge and enacted conduct. The cycle closes in character formation, which is not an end point but the input to the next cycle.

Three features distinguish this cycle from a generic model. First, its governing criterion at every stage is the *maqasid* orientation, not content coverage: a stage is well designed when it advances *taqwa* and *akhlaq*, not when it transmits more material. Second, adaptation is built in through explicit feedback: assessment evidence at each cycle revises the learner profile and the next cycle's differentiation, so the model is iterative by construction rather than linear. Third, the decision that character formation "has occurred" is not left to intuition. A teacher determines readiness to advance using triangulated evidence documented conduct (for example, a recorded act of service), the learner's own reflection, and a peer or halaqah observation rather than a single test score; where these disagree, the conservative judgement is retained and the next cycle revisits the value in question. To function as an implementable design rather than a generic process diagram, each stage carries a responsible actor, an entry condition, and an explicit criterion for advancing to the next stage; Appendix E specifies these decision points and actors stage by stage, and the dashed feedback

path in Figure 2 marks where assessment evidence re-enters the input stage to revise the learner profile.

The practical recommendations are stated as a bounded pilot protocol rather than as open-ended advice, so that the model can be tested. For an initial pilot in a single age segment, the protocol specifies: (a) teacher preparation a short preparation sequence covering differentiation, reflection-based assessment, and data governance; (b) lesson-planning artefacts for each unit, a stated target SMART-Islami characteristic, the digital support that reinforces it between sessions, and the evidence that will count as learning (a reflection entry, a peer-led halaqah segment, a documented act of service); (c) data-governance responsibilities a named person accountable for consent, storage, and access, using a protocol sized to a part-time, volunteer-run setting and compliant with applicable data-protection guidance (Personal Data Protection Commission Singapore, 2021); (d) family participation a defined channel for parental consent and for reporting character-growth feedback home; (e) an evaluation schedule a baseline, a mid-term review, and an end-of-term review against the defined indicators; and (f) minimum resource conditions.

The claim is not that implementation is cheap or technology-light. A feasible pilot requires baseline digital infrastructure (reliable devices and connectivity for home reinforcement), teacher competence in differentiation and in basic data handling, protected curriculum time within an already-compressed part-time schedule, and additional teacher workload for planning, reflection review, and record-keeping that must be budgeted rather than assumed. It also requires safeguarding arrangements appropriate to work with minors, a maintenance plan for whatever platform is used, and a line of institutional accountability for data and for the pilot's evaluation. Where these conditions cannot be met, the framework functions as a diagnostic of what must be built first rather than as a design ready to run. For curriculum developers, the same logic implies resequencing thematic units so each carries a personalisation layer, and treating the blended-learning design as a planned curriculum artefact rather than an add-on left to individual teachers.

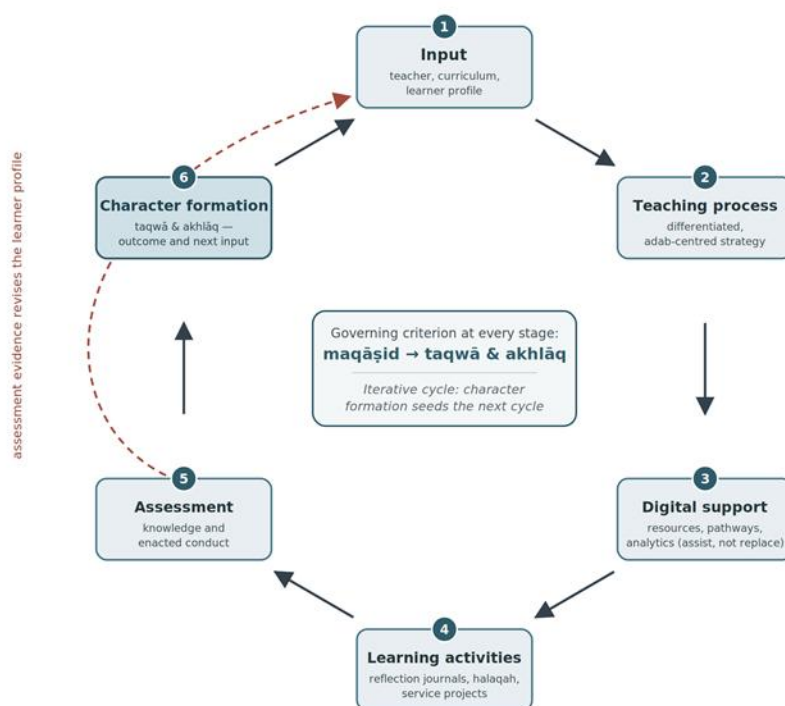


Figure 2. The SMART-Islami implementation cycle

Six stages run clockwise from teacher-and-curriculum input to character formation; the dashed loop marks the feedback path by which assessment evidence revises the learner profile for the next cycle. Stage-by-stage responsible actors and advance criteria are given in Appendix E.

Discussion

The findings of this study indicate that the central challenge in integrating smart education into Islamic education is not merely technological readiness, but the pedagogical, ethical, and epistemological alignment of digital innovation with the formative aims of Islamic learning. The mapping of the aLIVE programme shows that digital tools can support access, continuity, and personalised learning opportunities; however, technology becomes educationally meaningful only when it strengthens *adab*, teacher guidance, learner engagement, parental participation, and the moral formation of students. Thus, the proposed SMART-Islami framework contributes to the research objective by reconstructing smart education through Islamic educational values, particularly *maqāṣid al-sharīʿah*, teacher moral agency, content verification, and responsible data governance.

This finding is consistent with global studies published between 2020 and 2026 which argue that artificial intelligence and digital learning should be understood as socio-technical systems rather than neutral instructional tools. Holmes and Tuomi (2022) emphasise that AI in education can expand personalisation and feedback, yet it also raises questions about pedagogy, governance, and educational purpose. Similarly, Nguyen et al. (2023) identify transparency, fairness, privacy, accountability, and human oversight as core ethical principles for AI in education. The present study supports these concerns but extends them by showing that in Islamic education, human oversight is not only a technical safeguard but also an epistemological necessity related to *sanad*, religious authority, and the moral role of teachers. This position also resonates with Akgun and Greenhow (2022), who warn that AI use in K–12 settings can reproduce bias, weaken privacy protection, and reshape teacher–student relationships if not governed carefully. However, unlike most global AI-education literature, which generally frames ethics in universal and secular terms, this study argues that Islamic education requires an additional normative layer that defines what counts as valid knowledge, appropriate authority, and morally responsible digital practice.

The results also align with recent research on student engagement and media literacy. Bond et al. (2020) show that educational technology can enhance engagement when it supports cognitive, behavioural, affective, and social participation rather than merely delivering content. Zhang et al. (2024) further demonstrate that structured digital media literacy instruction can improve students' capacity to interpret and use digital information critically. These findings support the SMART-Islami emphasis on media literacy as part of moral and religious formation. Nevertheless, the present study adds that media literacy in Islamic education should not be limited to technical evaluation of sources; it must also include ethical judgment, humility toward religious authority, and awareness of how digital interaction shapes Muslim identity. This is important because global evidence on adolescents' digital lives shows that social media and online participation have complex associations with well-being, identity, and mental health, with effects depending on context, vulnerability, and patterns of use rather than screen exposure alone (Odgers & Jensen, 2020; Valkenburg et al., 2022). Therefore, SMART-Islami positions digital learning as a guided environment for identity formation, not simply as a platform for information access.

In the Indonesian and regional context, the findings are strongly supported by studies on Islamic education, character formation, and digital pedagogy. Al Khansa et al. (2024), in a study involving Muhammad Sufian, found that integrated Islamic Religious Education can increase student engagement and support honesty, discipline, and cooperation when religious values are embedded in relatable learning scenarios. Koderi et al. (2023) also show that local wisdom-based film media can make Arabic learning more engaging and effective, suggesting that culturally grounded digital media can strengthen both learning outcomes and identity formation. Erlina et al. (2025a) similarly demonstrate that problem-based Arabic learning can foster religious moderation, while Erlina et al. (2025b) show that gender-responsive qira'ah modules can improve students' understanding of equality and inclusivity in Islamic higher education. These studies reinforce the present finding that digital and innovative pedagogy should be culturally situated, value-oriented, and responsive to learners' social realities. In comparison, DiSoLife studies by Handoko et al. (2025) and Hariandini et al. (2026) highlight that digital learning trajectories are shaped by context, biography, teacher competence, and institutional support. This supports the argument that SMART-Islami must be implemented through teacher preparation and reflective instructional design, not through technology adoption alone.

The theoretical, pedagogical, and policy implications of this study are therefore interdependent. Theoretically, SMART-Islami extends smart education, TPACK, and responsible-AI frameworks by inserting an explicit Islamic normative foundation into decisions about personalisation, content authority, learner autonomy, and ethical digital engagement. Pedagogically, the findings suggest that educators should use digital tools to strengthen student engagement, emotional well-being, media literacy, and ethical online behaviour through guided inquiry, verified religious content, reflective dialogue, and teacher-mediated interpretation. Digital learning should help students become critical, morally responsible, and socially aware users of online environments, rather than passive recipients of algorithmically curated information. From a policy perspective, Islamic education institutions should develop clear standards for AI-assisted materials, student data protection, teacher training, parental consent, religious content validation, and reporting mechanisms for harmful or inaccurate digital content. This is especially important in contexts involving minors, religious identity formation, and online interaction, where privacy and moral responsibility are central concerns (Edi & Alghifari, 2026; Fikri & Triono, 2026).

The novelty of this study lies in its reconstruction of smart education through a specifically Islamic pedagogical framework rather than treating digital transformation as a universal model that can be transferred unchanged across contexts. By using the aLIVE programme as an instrumental case, the study contributes a conceptual model that integrates smart learning, *maqāṣid*-oriented reasoning, teacher moral agency, media literacy, parental participation, and data ethics. Methodologically, the study advances the literature by moving beyond general claims about "technology integration" and offering a structured framework with potential indicators for future empirical validation. This contribution is particularly important for Muslim-minority and mosque-based educational contexts, where religious education must negotiate modern digital infrastructures while preserving communal learning, scholarly authority, and moral formation.

Several limitations should be acknowledged. This study relies primarily on documentary and conceptual analysis; therefore, it cannot determine whether SMART-Islami improves learning outcomes, character formation, emotional well-being, or students' media literacy in actual

classrooms. The aLIVE case is also context-specific and may not represent Islamic education systems in Muslim-majority countries, formal madrasahs, pesantren, or public schools. In addition, institutional documents may emphasise programme ideals more than everyday teaching practices. Future research should test SMART-Islami through design-based research, mixed-methods studies, classroom observation, teacher interviews, student surveys, and longitudinal analysis. Comparative studies across Singapore, Indonesia, Malaysia, and other Muslim educational contexts would also help clarify which elements of the framework are transferable and which require contextual adaptation.

Conclusion

This study repositions smart education from a technology-oriented paradigm toward a pedagogical innovation grounded in the epistemological foundations of Islamic education. Through documentary analysis of Singapore's aLIVE programme as an instrumental case, it finds that the programme's documented strengths lie in value modelling, character formation, and community-based learning, while the public record does not evidence personalised learning, adaptive pedagogy, or ethically governed digital support. SMART-Islami reconstructs the three pillars of smart education through a specified *maqasid* formulation, *adab*, and holistic human development, and expresses them as a six-stage implementation model with stated decision rules, feedback, and indicators.

The framework is a conceptual proposition informed by documentary analysis, not an empirically validated model, and its transferability beyond a favourably selected case remains open. The most immediate testable next step is a single-centre, single-age-band design-based pilot that operationalises the Table 2 indicators and the implementation protocol, measuring whether SMART-Islami's differentiated, *adab*-centred cycle produces documented gains in defined character-formation and Qur'anic-literacy indicators relative to current practice. Such a study would provide the first falsifiable evidence of the framework's pedagogical value and mark the point at which SMART-Islami could move from proposition to tested model.

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