**ISSN:** 2581-4311
**DOI:** doi.org/10.30967/IJCRSET/Aadil-Bouhlaoui/205

URF PUBLISHERS
connect with research world

International Journal of Current Research in Science, Engineering & Technology

https://urfpublishers.com/journal/ijcrset

Vol: 8 & Iss: 4

*Research Article*

# AI as an Alternative to Problematic Human Dependency in Learning Contexts: Fostering Learner Autonomy in Constrained Islamic Educational Ecosystems

**Aadil Bouhlaoui***

Department of Digital Humanities, King's College of London, UK

**Citation:** Bouhlaoui A. AI as an Alternative to Problematic Human Dependency in Learning Contexts: Fostering Learner Autonomy in Constrained Islamic Educational Ecosystems. *Int J Cur Res Sci Eng Tech* 2025; 8(4), 442-453. DOI: doi.org/10.30967/IJCRSET/Aadil-Bouhlaoui/205

**Received:** 10 November, 2025; **Accepted:** 18 November, 2025; **Published:** 20 November, 2025

***Corresponding author:** Aadil Bouhlaoui, Department of Digital Humanities, King's College of London, UK, Email: aadil.bouhlaoui@kcl.ac.uk



## ABSTRACT

This article examines how Artificial Intelligence (AI) can mitigate problematic forms of dependency on human mentors in Islamic educational contexts constrained by post9/11 securitization policies. Drawing on the Islamic epistemological concepts of Naql (transmitted knowledge) and 'Aql (rational inquiry), alongside Western theories of learner autonomy and self-regulated learning, we analyze how restricted access to diverse scholarly perspectives can create interpretive bottlenecks for Muslim learners in Western societies. The research demonstrates how thoughtfully designed AI applications can expand access to diverse Islamic scholarly traditions while fostering critical engagement with religious texts. Through analysis of pioneering AI initiatives in Arab nations and a case study of the author's experimental Tajweed Project prototype, we illustrate AI's potential to complement traditional pedagogical approaches while respecting the ethical parameters of Islamic education. The article contributes to emerging discourse on technology-enhanced religious education by proposing a framework for AI implementation that balances innovation with tradition, autonomy with guidance and technological capability with educational values. This research has significant implications for Muslim communities navigating educational constraints in securitized environments and offers insights into how AI might transform religious education more broadly.

## Introduction

The pursuit of knowledge is intrinsically linked to the development of independent understanding and critical engagement. However, for many Muslim communities in Western societies, the landscape for acquiring religious knowledge has been significantly reshaped by the geopolitical dynamics following the September 11th attacks. This article examines the potential of Artificial Intelligence (AI) to mitigate problematic forms of dependency on human mentors that can arise in these constrained learning environments.

Within Islamic intellectual traditions, two fundamental epistemological concepts frame our analysis: Naql (transmitted or revealed knowledge) and ‘Aql (intellect and rational inquiry). Naql primarily encompasses the Quran and Hadith (Prophetic traditions), forming the foundation of Islamic teachings, while ‘Aql denotes the application of reason, critical thinking and jurisprudential methodology to understand and apply these foundational texts. Both are vital for a comprehensive Islamic education, functioning in a complementary rather than oppositional relationship. However, securitization policies and a climate of suspicion have, in some instances, curtailed access to a diversity of Naql and hindered the uninhibited exercise of ‘Aql, leading learners to an over-reliance on readily available

and sometimes singular, interpretive authorities. This dynamic is particularly pronounced in Western contexts where Muslim communities face heightened scrutiny, limited institutional resources and restricted access to diverse scholarly perspectives.

This article posits that AI, thoughtfully designed and ethically implemented, can serve as a valuable complementary resource to foster learner autonomy within these specific constrained environments. By expanding access to a broader spectrum of scholarly sources and providing tools that support critical engagement, AI can empower learners to navigate their intellectual heritage more independently. This is not to suggest AI can replace the invaluable role of human mentorship, but rather that it can address specific challenges arising from restricted educational ecosystems, thereby reducing the potential for uncritical acceptance of limited viewpoints and fostering a more robust, autonomous engagement with Islamic knowledge.

The analysis that follows examines the nature of these constrained educational contexts, the specific forms of problematic dependency they can engender and the theoretical frameworks of learner autonomy that inform our approach. We then critically evaluate AI's potential role as complementary pedagogical support, using the author's experimental Tajweed Project prototype as an illustrative case study. Throughout, we maintain focus on the specific Western post-9/11 context that frames our inquiry, while acknowledging the broader implications for Islamic education globally.

## Constrained Educational Contexts

The educational landscape for Muslim communities in Western societies has been profoundly altered by post-9/11 securitization policies and their sociopolitical aftermath. This section examines how these constraints have created specific challenges for Islamic education, particularly regarding access to diverse scholarly perspectives and the development of critical religious literacy.

### Securitization and its educational impact

The securitization of Islam-the process by which Islamic religious practice and education have become framed as security concerns-has created a complex web of formal and informal constraints on Islamic educational institutions and practices in Western contexts. Formal constraints include increased surveillance of Islamic educational spaces, restrictive visa policies limiting the movement of religious scholars and heightened scrutiny of educational materials and curricula. These measures have been implemented under various counter-terrorism and counter-extremism frameworks, often with significant implications for religious education. Such scrutiny can lead to what Eickelman identified as a "chilling effect" on educational institutions, a phenomenon observed when institutions adopt cautious approaches to teaching and curriculum development to avoid unwanted attention[1]. In the context of post-9/11 securitization, this caution often manifests as self-censorship, avoidance of certain theological topics deemed sensitive or reluctance to engage with diverse interpretive traditions that might be misunderstood by external observers unfamiliar with Islamic scholarly discourse.

### Restricted access to diverse scholarly perspectives

A direct consequence of securitization has been the restricted flow of religious scholars and educational materials between Muslim-majority countries and Western Muslim communities. Visa restrictions and enhanced vetting procedures have limited opportunities for visiting scholars to teach in Western contexts, while increased scrutiny of imported religious texts has constrained the diversity of materials available to learners. This restriction is particularly significant given the importance of scholarly diversity in Islamic educational traditions. Historically, Islamic learning emphasized exposure to multiple scholarly perspectives and interpretive approaches, with students often traveling extensively to study with different teachers-a practice known as rihla fi talab al-'ilm (journeying in search of knowledge). The current constraints have disrupted this educational model, limiting Western Muslim communities' access to the full spectrum of Islamic scholarly thought.

### Institutional underdevelopment and resource limitations

Many Western Muslim communities face significant challenges in developing robust educational institutions due to financial constraints, limited human resources and regulatory hurdles. Unlike established religious communities with centuries of institutional presence, Muslim communities in many Western contexts are relatively recent and still developing their educational infrastructure. This institutional underdevelopment means that many Muslims rely on informal or ad hoc educational arrangements, including weekend schools, study circles or online resources of varying quality and reliability. While these arrangements provide valuable educational opportunities, they often lack the depth, breadth and systematic approach of more established educational institutions.

### Digital information landscape and algorithmic curation

The constraints on traditional educational pathways have led many Muslim learners to turn to digital resources for religious education. However, the digital information landscape presents its own challenges. Online Islamic content is subject to algorithmic curation that may prioritize certain perspectives based on popularity, controversy or alignment with dominant narratives rather than scholarly merit or educational value. Gillespie argues that platform algorithms can create "filter bubbles" that limit exposure to diverse perspectives, potentially reinforcing existing biases or narrow interpretations[2]. For Muslim learners seeking religious knowledge online, these algorithmic dynamics can inadvertently restrict access to the full spectrum of Islamic scholarly thought, despite the apparent abundance of information.

### Implications for learner autonomy

These constrained educational contexts have significant implications for learner autonomy in Islamic education. Limited access to diverse scholarly perspectives can create what might be termed "interpretive bottlenecks," where learners become dependent on a narrow range of interpretive authorities. This dependency can inhibit the development of critical religious literacy and independent reasoning skills that are valued within Islamic intellectual traditions. The constraints described above do not affect all Western Muslim communities equally. Factors such as community size, socioeconomic resources, geographical location and ethnic composition influence how these constraints manifest and how communities respond to them. Nevertheless, these constraints create a common set of challenges that call for innovative approaches to Islamic education-approaches that can expand access to diverse scholarly perspectives while fostering critical engagement with religious texts and traditions.

## Problematic Human Dependency in Islamic Educational Contexts

The constrained educational environments described in the previous section can foster problematic forms of dependency on human mentors or interpretive authorities. This section analyses these dependencies through the lens of Islamic epistemological concepts and examines their implications for learner development.

### Conceptualizing dependency in Islamic educational contexts

Dependency in educational contexts refers to reliance on external sources of knowledge or authority that inhibits the development of critical thinking, independent reasoning and personal ownership of learning. In Islamic educational contexts, this dependency becomes problematic when it conflicts with the balanced relationship between Naql and 'Aql that has historically characterized Islamic intellectual traditions. Islamic scholarly tradition recognizes the importance of human teachers and the transmission of knowledge through established chains (isnad). However, it simultaneously values the development of independent reasoning capacities, particularly as learners advance in their studies. The Quranic injunction to "reflect" (tadabbur) and "contemplate" (tafakkur) emphasizes the importance of active intellectual engagement rather than passive reception of knowledge.

### Forms of problematic dependency

#### Uncritical adherence to limited interpretive authorities

In constrained educational environments with limited access to diverse scholarly perspectives, learners may develop an over-reliance on readily available interpretive authorities. This can manifest as uncritical acceptance of singular interpretations without awareness of the broader spectrum of scholarly opinions on a given matter. While respect for scholarly authority (taqlīd) is an established principle in Islamic learning, it becomes problematic when learners lack exposure to the diversity of legitimate interpretive traditions within Islam. Different Islamic traditions approach the balance between authority and autonomy distinctively. Sufi traditions emphasize the spiritual guidance of a sheikh while cultivating the disciple's inner spiritual autonomy. Shi'a approaches focus on the authoritative guidance of recognized scholars (marāji') while encouraging questioning within established parameters. Sunni traditions vary in their emphasis on following established schools of thought (madhāhib) versus independent reasoning (ijtihād). When educational constraints limit exposure to this diversity, learners may develop a narrow understanding of how authority and autonomy function within Islamic intellectual traditions.

#### Substitution of memorization for understanding

Limited educational resources can lead to an overemphasis on memorization (hifz) at the expense of comprehension (fahm) and critical engagement (tadabbur). While memorization of core texts is valued in Islamic educational traditions, it is ideally complemented by deep understanding and application. The Prophet Muhammad emphasized this balance when he said, "Knowledge is not abundant narration, but rather it is a light that Allah places in the heart" (reported by Al-Khatib). When educational constraints limit opportunities for in-depth study and discussion, learners may resort to memorizing positions or rulings without developing the conceptual frameworks needed to understand their contexts, limitations and applications. This creates a form of dependency where learners possess information but lack the interpretive tools to engage with it independently.

#### Fragmented knowledge acquisition

Constrained educational environments often lead to fragmented knowledge acquisition, where learners piece together religious understanding from disconnected sources without a coherent framework. This fragmentation can create dependency on external authorities to resolve apparent contradictions or fill knowledge gaps. Traditional Islamic education emphasized a systematic progression through interconnected disciplines, with each building upon the other to develop a comprehensive understanding. When this systematic approach is disrupted by educational constraints, learners may struggle to integrate different aspects of Islamic knowledge into a coherent whole, creating ongoing dependency on external sources for synthesis and integration.

### Implications for learner development

These forms of problematic dependency have significant implications for learner development in Islamic educational contexts:

- **Limited development of critical religious literacy:** Dependency on narrow interpretive authorities can inhibit the development of critical religious literacy- the ability to engage thoughtfully with religious texts and traditions, recognize diverse interpretations and evaluate arguments based on established methodological principles.
- **Vulnerability to simplistic or decontextualized interpretations:** Learners with limited exposure to the breadth and depth of Islamic scholarly tradition may be vulnerable to simplistic or decontextualized interpretations that fail to account for the nuance and complexity of Islamic thought.
- **Difficulty navigating contemporary challenges:** Dependency on external authorities for all religious questions can leave learners ill-equipped to navigate contemporary challenges that require applying Islamic principles to novel contexts not directly addressed in traditional sources.
- **Inhibited spiritual and intellectual growth:** Islamic traditions view the journey of learning as a process of spiritual and intellectual growth. Problematic dependencies can inhibit this growth by limiting the learner's active engagement with the tradition.

It is important to note that these problematic dependencies are not inherent to Islamic educational approaches but rather emerge from the specific constraints described in the previous section. Traditional Islamic education, when functioning optimally, cultivates a balance between respect for scholarly authority and development of independent reasoning capacities. The challenge in constrained educational environments is to restore this balance through innovative approaches that expand access to diverse scholarly perspectives while fostering critical engagement with religious texts and traditions.

## Theoretical Framework: Learner Autonomy and Self-Regulated Learning

This section establishes the theoretical framework that informs our approach to addressing problematic dependencies

in Islamic educational contexts. Drawing on both Western educational theories of learner autonomy and self-regulated learning and Islamic concepts of knowledge acquisition, we develop an integrated framework that respects Islamic epistemological foundations while leveraging contemporary educational insights.

**Western perspectives on learner autonomy**

Learner autonomy, as conceptualized in Western educational theory, refers to "the ability to take charge of one's own learning"[3]. This involves determining objectives, defining content, selecting methods, monitoring progress and evaluating outcomes. Benson expanded this definition to include psychological, technical and political dimensions of autonomy, recognizing that autonomy operates within social contexts and power structures that can either enable or constrain independent learning[4]. Self-regulated learning theory, particularly as developed by Zimmerman[5,6], provides a complementary perspective that emphasizes the cognitive, motivational and behavioral processes through which learners systematically direct their learning.

Zimmerman's cyclical model identifies three phases of self-regulation:

- **Forethought:** Setting goals, strategic planning and activating self-motivation.
- **Performance:** Implementing strategies, self-observation and metacognitive monitoring.
- **Self-reflection:** Self-evaluation, causal attribution and adaptive responses.

These Western theoretical frameworks offer valuable insights into how learners develop independence and agency in educational contexts. However, they emerge from specific cultural and philosophical traditions that may not fully align with Islamic epistemological frameworks. Therefore, we must integrate these insights with Islamic perspectives on knowledge acquisition and learner development.

**Islamic perspectives on knowledge acquisition and learner development**

Islamic traditions offer rich conceptualizations of knowledge acquisition that both parallel and diverge from Western frameworks. Several key concepts are particularly relevant to our discussion of learner autonomy:

**Taqlīd, Ittibā' and Ijtihād: Degrees of interpretive authority**

Islamic scholarly tradition recognizes different modes of engaging with religious knowledge, representing varying degrees of interpretive authority and autonomy:

- Taqlīd refers to following scholarly opinions without necessarily knowing their evidential basis. This is appropriate for beginners or in matters requiring specialized expertise.
- Ittibā' involves following scholarly opinions after understanding their evidential basis, representing a more engaged form of learning.
- Ijtihad refers to independent reasoning based on primary texts and established methodological principles, representing the highest level of scholarly autonomy. These concepts establish a developmental trajectory from initial dependence on scholarly authority toward greater interpretive autonomy as learners advance in knowledge and methodological expertise.

**Ikhlāṣ and Tadabbur: Intentionality and reflection**

Islamic learning emphasizes both proper intention (ikhlāṣ) and deep reflection (tadabbur):

- Ikhlāṣ refers to sincerity of intention in seeking knowledge, ensuring that learning is pursued for appropriate spiritual and practical purposes rather than worldly gain or status.
- Tadabbur refers to deep, contemplative engagement with texts, particularly the Quran, involving reflection on meanings, implications and applications. These concepts highlight that autonomous learning in Islamic contexts is not merely about independent decision-making but also about the quality of engagement with knowledge sources.

## Adab al-'Ilm: Ethics of knowledge

Islamic tradition emphasizes adab al-'ilm (ethics of knowledge), which establishes proper relationships between learners, teachers and knowledge itself. This ethical framework recognizes the importance of respectful engagement with scholarly tradition while encouraging questioning and exploration within appropriate parameters.

**Integrated framework: Autonomy within tradition**

Drawing on both Western and Islamic perspectives, we propose an integrated framework of "autonomy within tradition" that respects the authority of Islamic scholarly tradition while fostering critical engagement and independent reasoning. This framework recognizes that:

- **Autonomy exists within epistemological boundaries:** Learner autonomy in Islamic contexts operates within established epistemological frameworks that recognize the authority of revelation (wahy) and prophetic guidance (Sunna).
- **Autonomy develops progressively:** Learners move gradually from greater dependence on scholarly authority toward more independent engagement as they develop knowledge and methodological expertise.
- **Autonomy requires methodological tools:** Effective autonomy depends on acquiring the methodological tools (uṣūl) needed to engage with primary texts and evaluate scholarly arguments.
- **Autonomy is communal as well as individual:** Islamic learning traditionally occurs within communities of practice where knowledge is collectively constructed and validated.
- **Autonomy serves ethical and spiritual purposes:** The goal of autonomous learning is not merely intellectual independence but ethical and spiritual development.

This integrated framework provides the theoretical foundation for our approach to addressing problematic dependencies in Islamic educational contexts. It suggests that AI tools, when thoughtfully designed and ethically implemented, can support learner autonomy by expanding access to diverse scholarly perspectives, providing methodological guidance and fostering critical engagement with texts and traditions- all while respecting the epistemological foundations and ethical parameters of Islamic education.

## Pioneering AI Growth in Leading Arab Nations: Transforming Islamic Education Internationally

Leading Arab countries, notably Saudi Arabia and the United Arab Emirates, are at the forefront of global Artificial Intelligence development, with ambitious strategic investments poised to significantly transform Islamic education on an international scale. These initiatives are creating powerful momentum for the Arabisation of AI and its widespread application, promising to enhance learning and knowledge accessibility for Muslim communities worldwide.

### Visionary leadership and Landmark investments

The drive towards AI leadership in Saudi Arabia and the UAE is characterized by top-down visionary directives and substantial, strategically allocated investments with profound implications for global Islamic learning. Saudi Arabia, guided by its transformative Vision 2030, is making monumental investments to establish itself as a global AI powerhouse. The nation's sovereign wealth fund, the Public Investment Fund (PIF), serves as a critical financial engine, notably backing HUMAIN with its ambitious $77 billion infrastructure buildout and $10 billion venture capital fund designed to invest in promising AI startups globally. These substantial financial commitments are attracting significant international collaboration, with HUMAIN securing deals worth $23 billion with leading U.S. technology firms such as Nvidia, AMD and Amazon Web Services.

The United Arab Emirates has distinguished itself as a swift and early adopter of AI, appointing the world's first Minister of State for Artificial Intelligence in 2017 and launching the National Strategy for AI 2031. Significant investments are being channeled into AI research, development and specialized education, with the Mohammed bin Zayed University of Artificial Intelligence (MBZUAI) standing as a testament to this commitment. G42, a prominent UAE-based AI company, has been instrumental in developing JAIS, a leading Arabic Large Language Model.

## The Arabisation of AI: Empowering Islamic learning

The "Arabisation of AI" is a pivotal concept in the strategies of Saudi Arabia and the UAE. It signifies more than mere translation; it involves the creation of AI systems, particularly Large Language Models, that are deeply proficient in Arabic language-encompassing its diverse dialects and Classical Arabic-and are imbued with an understanding of Arab culture and Islamic values. Saudi Arabia's commitment to the Arabisation of AI is spearheaded by significant national entities. SDAIA has developed "ALLAM," an advanced Arabic LLM engineered to enhance Arabic-language AI services across multiple sectors, including education. The model has been trained on extensive Arabic and English datasets, featuring an expanded vocabulary specifically for Arabic to capture its richness and complexity.

The UAE has made remarkable strides with the development of JAIS by G42 in collaboration with MBZUAI. JAIS stands as the world's most advanced open-sourced Arabic LLM, with capabilities extending to Modern Standard Arabic and various regional dialects. MBZUAI serves as a key research hub for Arabic Natural Language Processing, contributing significantly to the development of datasets and models for various forms of Arabic, including Classical Arabic.

### Revolutionizing access to Islamic knowledge

These advancements in AI are set to revolutionize how Islamic knowledge is accessed, understood and disseminated globally. By developing sophisticated tools that can accurately understand, process and generate content in Arabic, these initiatives make digital Islamic educational resources more accessible, relevant and effective for Muslim learners worldwide. The UAE's strategic emphasis on open-source initiatives, such as making the JAIS model publicly available, acts as a powerful catalyst for wider Arabic AI development. This approach democratizes access to cutting-edge AI education and development tools, enabling academic institutions and developers to leverage these foundational models for Islamic educational applications.

### Collaborative future for international Islamic education

The pioneering investments in AI by Saudi Arabia and the UAE are foundational to a new era in Islamic education internationally. These initiatives offer powerful tools and resources that promise to enhance learning, broaden access to knowledge and support educators globally. To maximize this global positive impact, there is a unique opportunity for synergy and collaboration between these leading AI initiatives and diverse international stakeholders, including technologists, Islamic scholars, educators and community representatives from around the world. By thoughtfully engaging with these technological advancements, the global Muslim community can collectively shape AI tools that serve authentic educational goals, ensuring that the benefits of this AI revolution are realized for generations to come.

## AI as Complementary Pedagogical Support

This section examines how AI can serve as complementary pedagogical support in Islamic educational contexts, addressing the problematic dependencies identified earlier while respecting the epistemological foundations and ethical parameters of Islamic education.

### Expanding access to diverse scholarly perspectives

One of the most significant contributions AI can make to Islamic education in constrained contexts is expanding access to diverse scholarly perspectives. Large Language Models (LLMs) trained on comprehensive collections of Islamic texts can provide learners with exposure to multiple interpretive traditions, schools of thought and scholarly opinions that might otherwise be inaccessible due to geographical, political or institutional constraints. AI systems can be designed to present multiple scholarly positions on a given question, along with their evidential bases and methodological approaches. This presentation of diversity can help learners understand that Islamic scholarly tradition encompasses legitimate differences of opinion (ikhtilaf) within methodological parameters, countering the problematic dependency on limited interpretive authorities that can arise in constrained educational environments.

### Supporting critical engagement with texts

Beyond simply providing access to diverse perspectives, AI can support critical engagement with Islamic texts by:

- **Contextualizing texts historically and linguistically:** AI systems can provide historical context, linguistic analysis

and intertextual connections that help learners understand texts in their proper contexts rather than in isolation.

- **Explicating methodological principles:** AI can make explicit the interpretive methodologies (uṣūl) employed by different scholars, helping learners understand not just conclusions but the reasoning processes that led to them.
- **Facilitating comparative analysis:** AI can support side-by-side comparison of different interpretations, highlighting points of agreement and divergence and the evidential and methodological bases for these differences. These capabilities can help address the problematic substitution of memorization for understanding by providing learners with the conceptual frameworks and methodological tools needed for deeper engagement with texts.

**Providing structured learning pathways**

AI can help address the fragmentation of knowledge acquisition by providing structured learning pathways that integrate different aspects of Islamic knowledge into coherent frameworks. These pathways can be personalized to learners' backgrounds, interests and goals while ensuring comprehensive coverage of foundational concepts and methodologies. By mapping connections between different disciplines and concepts, AI can help learners develop the integrative understanding that might otherwise require years of systematic study under human teachers. This integration can reduce dependency on external authorities for synthesis and coherence.

**Supporting self-regulated learning**

Drawing on the theoretical framework of self-regulated learning, AI can support learners in developing greater autonomy by:

- **Goal-setting and planning:** Helping learners articulate clear learning goals and develop realistic plans to achieve them.
- **Progress monitoring:** Providing ongoing feedback on progress and identifying areas needing additional attention.
- **Self-assessment:** Offering opportunities for learners to test their understanding and application of concepts.
- **Metacognitive development:** Prompting reflection on learning processes and strategies. These supports can help learners develop the self-regulatory capacities needed for more autonomous engagement with Islamic knowledge, reducing problematic dependencies on external guidance for all aspects of learning.

**Limitations and complementary role**

While AI offers significant potential benefits for Islamic education in constrained contexts, it is important to recognize its limitations and emphasize its complementary rather than replacement role:

- **Epistemological limitations:** AI lacks the embodied knowledge, spiritual insight and lived experience that human teachers bring to Islamic education. It cannot replicate the suhba (companionship) dimension of traditional Islamic pedagogy that involves character formation through close association with exemplary teachers.
- **Methodological limitations:** Current AI systems have limited capacity for original ijtihad (independent reasoning) and cannot engage in the dynamic, contextual application of principles that characterizes advanced Islamic scholarship.
- **Ethical limitations:** AI lacks the moral agency and spiritual consciousness that inform human teaching in Islamic contexts. It cannot model the ethical virtues that are integral to Islamic educational traditions. Given these limitations, AI is best understood as a complementary resource that expands access to knowledge and supports critical engagement while acknowledging the irreplaceable role of human teachers, especially for advanced learning and spiritual development. The goal is not to replace human mentorship but to address specific constraints that can lead to problematic dependencies in particular educational contexts.

**Ethical implementation considerations**

Implementing AI in Islamic educational contexts requires careful attention to ethical considerations, including:

- **Transparency about sources and methodologies:** AI systems should clearly indicate the sources of information and the methodological approaches they represent, enabling learners to evaluate their authority and relevance.
- **Representation of diversity:** Systems should be designed to represent the legitimate diversity of Islamic scholarly traditions rather than privileging particular interpretations or approaches.
- **Appropriate epistemic humility:** AI should be designed to acknowledge the limitations of computational approaches to religious knowledge and to recognize questions that require human scholarly engagement.
- **Cultural and contextual sensitivity:** Systems should be attentive to the diverse cultural contexts in which Islamic education occurs and avoid universalizing particular cultural expressions of Islam. These ethical considerations are essential for ensuring that AI serves as a beneficial complement to human teaching rather than introducing new forms of problematic dependency or misrepresentation.

## Case Study: The Tajweed Project - A Conceptual Proof-of-Concept

**Author disclosure and project context**

The Tajweed Project, developed by the author as a conceptual proof-of-concept experiment through ZADI.AI Ltd (a startup founded by the author in late 2024), serves as an illustrative example of how AI might potentially address specific challenges in Islamic educational contexts. It is important to note that this project exists as an experimental prototype created using the no-code platform and has not been deployed as a live service or undergone formal empirical testing. The author developed this prototype specifically to demonstrate both the feasibility and potential risks of applying AI to religious educational contexts.

**Project description and Conceptual framework**

The Tajweed Project prototype explores how AI might potentially support Quranic recitation learning-a domain traditionally requiring close human supervision. Tajweed refers to the rules governing proper Quranic pronunciation, a discipline requiring precise articulation of Arabic phonetics and application of specialized recitation rules. In Western contexts where qualified Tajweed teachers are scarce, learners often face significant challenges in receiving consistent feedback and guidance. The prototype conceptually demonstrates

several potential functionalities: speech recognition to analyze recitation, pattern matching to identify pronunciation errors and personalized feedback generation. These features are designed to address specific aspects of problematic dependency by potentially providing immediate feedback when human teachers are unavailable and offering a private practice environment that might reduce anxiety associated with reciting in front of others-a common barrier for beginners.

### Critical evaluation and limitations

This experimental prototype, while illustrating potential applications, faces significant limitations that warrant critical examination. First, the speech recognition capabilities of current AI systems struggle with the phonetic precision required for proper Tajweed evaluation. The subtle distinctions between similar Arabic sounds often fall below the detection threshold of existing models, potentially leading to missed errors or false corrections that could reinforce incorrect recitation habits. Second, the prototype lacks the contextual understanding that human teachers bring to Tajweed instruction. Human teachers can identify patterns in student errors, adapt teaching approaches based on individual learning styles and connect pronunciation challenges to broader aspects of a student's language background-capabilities beyond current AI systems. This limitation highlights the risk of creating a false sense of mastery if learners rely exclusively on AI feedback. Third, the prototype raises important questions about embodied knowledge transmission. Tajweed has traditionally been taught through direct observation and mimicry, with students learning not just rules but subtle oral traditions passed through generations of teachers. An AI system, regardless of technical sophistication, cannot embody this tradition in the same way human teachers do, potentially contributing to a mechanistic understanding of what is, for many Muslims, a deeply spiritual practice.

### Justification as case study

Despite these limitations, this conceptual prototype serves as a valuable case study for several reasons directly relevant to the article's theoretical framework. First, it concretely illustrates the specific type of problematic dependency addressed in this paper- reliance on scarce human teachers in constrained educational environments. The domain of Tajweed instruction is particularly affected by the securitization dynamics discussed earlier, as qualified teachers from Muslim-majority countries face increasing barriers to teaching in Western contexts. Second, the prototype demonstrates the potential application of learner autonomy principles in religious education. By conceptualizing a tool that could potentially provide immediate feedback and self-directed practice opportunities, it explores how technology might support the development of self-regulated learning in specific religious educational contexts. Third, the prototype's limitations highlight the critical tensions between technological capability and educational values that must be navigated in any AI application to Islamic education. These tensions directly inform the ethical considerations and theoretical discussions presented throughout this article. By examining this experimental prototype-with clear acknowledgment of its conceptual nature, limitations and the author's direct involvement-we gain concrete insights into both the potential and challenges of AI applications in addressing problematic dependencies in Islamic educational contexts.

## Ethical Considerations

The integration of AI into Islamic educational contexts raises important ethical considerations that must be carefully addressed to ensure that technological innovation serves authentic educational values and respects Islamic ethical principles. This section examines these considerations through both Islamic ethical frameworks and contemporary AI ethics discourse.

### Islamic ethical frameworks for technological innovation

Islamic ethical tradition offers several concepts that can guide the implementation of AI in educational contexts:

- **Amanah:** Technology as a Trust. The Quranic concept of Amanah (trust) suggests that technological capabilities represent a divine trust that carries responsibilities for proper use. This principle implies that AI should be developed and deployed in ways that fulfill educational responsibilities toward learners and uphold the integrity of Islamic knowledge transmission.
- '**Adl:** Justice and Fairness. The principle of 'adl (justice) requires that AI systems be designed and implemented in ways that promote equitable access to educational resources and avoid perpetuating or amplifying existing inequalities. This includes ensuring that AI tools are accessible to diverse Muslim communities regardless of socioeconomic status, language background or geographical location.
- **Maşlahah:** Public Benefit. The concept of maşlahah (public benefit) provides a framework for evaluating AI applications based on their contribution to individual and collective well-being. This principle suggests prioritizing AI applications that address genuine educational needs and produce substantive benefits rather than pursuing technological innovation for its own sake.
- **Wasaţiyyah:** Balanced Moderation. The principle of wasaṭiyyah (balanced moderation) encourages a middle path between uncritical embrace of technology and wholesale rejection. This balanced approach recognizes both the potential benefits of AI for addressing specific educational challenges and the importance of preserving traditional educational values and practices.

## Specific Ethical Considerations for AI in Islamic Education

### Representation and Bias

AI systems trained on existing textual corpora may inherit and amplify biases present in those materials. In Islamic educational contexts, this raises concerns about:

- **Representational balance:** Ensuring fair representation of diverse Islamic scholarly traditions, including minority perspectives that may be underrepresented in digitized collections.
- **Sectarian bias:** Avoiding systems that privilege particular sectarian perspectives or marginalize others.
- **Cultural bias:** Recognizing the diversity of cultural expressions of Islam and avoiding universalizing particular cultural forms as normative.
- **Gender considerations:** Ensuring that AI systems do not perpetuate gender biases in their representation of Islamic scholarship and practice. Addressing these concerns requires

careful curation of training data, ongoing monitoring for bias and transparent documentation of the sources and methodologies represented in AI systems.

**Authority and authenticity**

AI raises complex questions about religious authority and the authenticity of knowledge transmission:

- **Epistemic authority:** Clarifying the appropriate epistemic status of AI-generated content in relation to human scholarly authority.
- **Authentication mechanisms:** Developing mechanisms to verify the accuracy and authenticity of AI-generated religious content.
- **Transparency about limitations:** Clearly communicating the limitations of AI in engaging with religious texts and concepts.
- **Preservation of isnad:** Respecting the importance of chains of transmission in Islamic knowledge while exploring how digital technologies might support rather than supplant these traditions. These considerations suggest the need for collaborative approaches that involve Islamic scholars in the development, validation and ongoing oversight of AI systems used in religious education.

**Privacy and data ethics**

The use of AI in Islamic educational contexts raises important questions about privacy and data ethics:

- **Sensitive personal data:** Protecting information about individuals' religious beliefs, practices and questions, which may be particularly sensitive in contexts were Muslims face discrimination or surveillance.
- **Informed consent:** Ensuring that users understand how their data will be used and have meaningful choices about data collection and processing.
- **Data governance:** Developing appropriate governance structures for data collected in religious educational contexts, potentially including community oversight mechanisms.
- **Cultural sensitivity:** Recognizing that privacy norms may vary across cultural contexts and designing systems that respect these differences. These considerations suggest the need for robust privacy protections and data governance frameworks that align with Islamic ethical principles as well as contemporary data protection standards.

**Toward ethical implementation**

Addressing these ethical considerations requires collaborative approaches that bring together diverse stakeholders:

- **Interdisciplinary collaboration:** Engaging Islamic scholars, educators, technologists and ethicists in ongoing dialogue about the development and implementation of AI in Islamic educational contexts.
- **Community participation:** Involving Muslim communities in decisions about how AI is used in religious education, particularly in contexts where these communities face marginalization or constraints.
- **Iterative development:** Adopting iterative approaches that allow for ongoing evaluation and refinement based on educational outcomes and ethical considerations.
- **Contextual sensitivity:** Recognizing that ethical considerations may vary across different educational contexts and developing flexible frameworks that can be adapted to diverse settings. By addressing these ethical considerations thoughtfully, AI can be implemented in ways that support authentic educational goals while respecting the integrity of Islamic knowledge traditions and the needs of diverse learning communities.

## Discussion and Comparative Analysis

This section provides a comparative analysis of AI's potential role in addressing problematic dependencies in Islamic educational contexts, examining how this approach relates to other educational innovations and considering its broader implications for religious education.

**Comparing AI with other educational innovations**

**Traditional distance learning and online education**

Traditional distance learning and online education have attempted to address geographical and institutional constraints in Islamic education through remote access to teachers and resources. While these approaches have expanded access, they often replicate traditional teacher-centered pedagogies rather than addressing problematic dependencies directly. AI differs by potentially offering more personalized, adaptive support and facilitating greater learner autonomy through immediate feedback and self-directed exploration. However, online education offers advantages in human connection and community formation that current AI systems cannot replicate. The most effective approaches likely combine AI tools with human-facilitated online learning communities that provide social support and collective meaning-making.

**Digital libraries and repositories**

Digital libraries of Islamic texts have significantly expanded access to scholarly resources, addressing some constraints identified earlier. However, these repositories typically provide access without the interpretive guidance or methodological tools needed to engage with complex texts effectively. This can lead to superficial or decontextualized readings that create new forms of dependency on external interpretations. AI can potentially enhance digital repositories by providing contextual information, explanatory frameworks and methodological guidance that help learners engage more deeply with texts. The integration of AI with digital libraries represents a promising direction for supporting more autonomous engagement with Islamic scholarly traditions.

**Curriculum reforms and Pedagogical innovations**

Various curriculum reforms and pedagogical innovations have attempted to address challenges in Islamic education by updating content, integrating contemporary educational methods or developing new institutional models. These approaches often focus on formal educational settings and may have limited reach in constrained contexts where institutional development faces significant barriers. AI offers complementary benefits through its potential accessibility outside formal institutions and its capacity to provide personalized support tailored to diverse learning needs. However, curriculum reforms and institutional innovations remain essential for creating supportive educational ecosystems in which AI tools can be effectively integrated.

### Broader implications for religious education

#### Balancing tradition and innovation

The approach described in this article suggests a model for balancing tradition and innovation in religious education more broadly. Rather than positioning technology as either a replacement for traditional methods or a mere digitization of existing practices, it proposes a complementary role that addresses specific constraints while respecting core educational values. This balanced approach may offer insights for other religious traditions facing similar tensions between preserving traditional knowledge transmission practices and responding to contemporary educational challenges. The concept of "autonomy within tradition" provides a framework for thinking about how technological innovation can serve authentic educational goals rather than driving pedagogical choices.

#### Addressing power dynamics in religious education

The analysis of problematic dependencies highlights how educational constraints can create or reinforce power dynamics that limit learner agency and critical engagement. While this article has focused on specific constraints affecting Muslim communities in Western contexts, similar dynamics may exist in other religious educational settings where access to diverse perspectives is limited by institutional, political or cultural factors. AI's potential to democratize access to diverse scholarly perspectives suggests possibilities for addressing power imbalances in religious education more broadly. However, this potential can only be realized if AI systems themselves are designed with attention to representation, bias and accessibility-ensuring they do not simply reproduce existing power structures in digital form.

#### Implications for interfaith understanding

The development of AI tools for Islamic education may also have implications for interfaith understanding. By making diverse Islamic scholarly perspectives more accessible and providing contextual information that aids understanding, such tools could potentially contribute to more nuanced public discourse about Islam and counter simplistic or stereotypical representations. However, this potential benefit depends on how AI systems are designed and implemented. Systems that present Islamic traditions in isolation from their historical and intellectual contexts or that fail to represent their internal diversity, could potentially reinforce rather than challenge simplistic understandings.

### Critical reflections on the proposed approach

#### Potential risks and limitations

While this article has argued for AI's potential benefits in addressing specific educational constraints, several risks and limitations warrant critical reflection:

- **Technological determinism:** The proposed approach must avoid technological determinism—the assumption that technological solutions alone can address complex educational challenges shaped by political, social and institutional factors.
- **Oversimplification of tradition:** There is a risk that AI representations of Islamic scholarly traditions could oversimplify complex intellectual histories and debates, potentially creating new forms of reductive understanding.
- **Digital divide:** Unequal access to technology could exacerbate existing educational inequalities if AI tools are not designed with accessibility and inclusivity in mind.
- **Commercialization concerns:** Commercial interests in educational technology may prioritize scalability and profit over authentic educational values, potentially compromising the integrity of religious education.

#### Conditions for effective implementation

Addressing these risks requires attention to several conditions for effective implementation:

- **Collaborative development:** AI tools for Islamic education should be developed through collaborative processes that engage diverse stakeholders, including scholars, educators, technologists and community members.
- **Contextual integration:** These tools should be integrated into broader educational ecosystems rather than deployed as standalone solutions, with attention to how they complement other educational resources and practices.
- **Ongoing evaluation:** Implementation should include robust evaluation frameworks that assess not just technical performance but educational outcomes and alignment with core values.
- **Adaptive governance:** Governance structures should allow for ongoing adaptation based on emerging insights, changing needs and evolving technological capabilities. By attending to these conditions, the approach proposed in this article may offer a meaningful contribution to addressing specific challenges in Islamic education while respecting the integrity of Islamic knowledge traditions and supporting the development of more autonomous, critically engaged learners.

## Conclusion and Future Directions

This article has examined how Artificial Intelligence can serve as an alternative to problematic forms of human dependency in Islamic educational contexts constrained by post-9/11 securitization policies. Drawing on both Islamic epistemological concepts and Western theories of learner autonomy, we have analysed how AI might expand access to diverse scholarly perspectives while fostering critical engagement with religious texts and traditions.

### Summary of key findings

Our analysis has identified several ways in which thoughtfully designed and ethically implemented AI can address specific challenges in constrained Islamic educational contexts:

- **Expanding access to diverse scholarly perspectives:** AI can help overcome geographical, political and institutional barriers that limit access to the full spectrum of Islamic scholarly thought, addressing the "interpretive bottlenecks" that can arise in constrained educational environments.
- **Supporting critical engagement with texts:** By providing contextual information, explicating methodological principles and facilitating comparative analysis, AI can help learners develop deeper understanding rather than merely memorizing positions or rulings.

- **Providing structured learning pathways:** AI can address the fragmentation of knowledge acquisition by offering coherent, personalized learning pathways that integrate different aspects of Islamic knowledge into comprehensive frameworks.
- **Fostering self-regulated learning:** Through features that support goal-setting, progress monitoring, self-assessment and metacognitive development, AI can help learners develop greater autonomy in their educational journeys. These potential benefits are illustrated by initiatives such as the pioneering AI developments in Saudi Arabia and the UAE, which are creating powerful tools for Arabic language processing and Islamic knowledge dissemination and by experimental prototypes like the Tajweed Project, which explores specific applications in Quranic recitation learning.

At the same time, our analysis has highlighted important limitations and ethical considerations that must inform AI implementation in Islamic educational contexts. AI cannot replicate the embodied knowledge, spiritual insight and ethical modelling that human teachers provide. It lacks the capacity for original ijtihad and contextual application of principles that characterizes advanced Islamic scholarship. These limitations underscore that AI should serve as a complement to human teaching rather than a replacement, particularly for advanced learning and spiritual development.

**Theoretical and practical implications**

This research has several important theoretical and practical implications:

**Theoretical contributions**

- **Integrated theoretical framework:** By bringing together Islamic epistemological concepts and Western educational theories, this article contributes to the development of more culturally responsive frameworks for understanding learner autonomy in religious educational contexts.
- **Nuanced understanding of dependency:** The analysis of problematic dependencies offers a more nuanced perspective than binary oppositions between autonomy and authority, recognizing that autonomy in Islamic contexts operates within established epistemological frameworks and develops progressively as learners advance.
- **Contextual approach to educational technology:** By examining AI's potential role in addressing specific constraints, this research contributes to more contextual approaches to educational technology that consider how particular tools might address particular challenges in particular settings.

**Practical implications**

- **Design principles for AI in Islamic education:** The analysis suggests several design principles for AI systems in Islamic educational contexts, including transparency about sources and methodologies, representation of scholarly diversity, appropriate epistemic humility and cultural sensitivity.
- **Implementation considerations:** The discussion of ethical considerations provides practical guidance for implementing AI in ways that respect Islamic ethical principles and address concerns about representation, authority and privacy.
- **Collaborative development models:** The research highlights the importance of collaborative approaches that engage diverse stakeholders-including scholars, educators, technologists and community members—in the development and governance of AI for religious education.

**Limitations and future research directions**

This research has several limitations that suggest directions for future inquiry:

- **Empirical validation:** The potential benefits and limitations identified in this article require empirical validation through studies of actual AI implementations in Islamic educational contexts. Future research should examine how learners interact with such systems and assess their impact on educational outcomes and experiences.
- **Diverse contexts:** While this article has focused on Muslim communities in Western contexts affected by post-9/11 securitization, future research should examine how AI might address educational challenges in other contexts, including Muslim-majority countries with different constraints and opportunities.
- **Technical development:** Further technical research is needed to address specific challenges in applying AI to Islamic educational contexts, including improved Arabic language processing, better handling of classical texts and more sophisticated representation of scholarly methodologies.
- **Governance frameworks:** Additional research is needed to develop appropriate governance frameworks for AI in religious education, including mechanisms for scholarly oversight, community participation and ongoing evaluation.
- **Comparative perspectives:** Comparative studies examining how different religious traditions are engaging with AI could yield valuable insights into common challenges and diverse approaches to balancing tradition and innovation.

**Concluding reflections**

The relationship between technology and religious education has always been complex, with each new technological development raising questions about how innovation might serve tradition rather than supplanting it. AI represents a particularly significant development due to its capacity not just to transmit but to engage with religious content in increasingly sophisticated ways. This article has argued that AI, when thoughtfully designed and ethically implemented, can serve as a valuable complement to human teaching in Islamic educational contexts, particularly those facing specific constraints that limit access to diverse scholarly perspectives. By expanding this access and supporting critical engagement with texts and traditions, AI can help address problematic dependencies while respecting the epistemological foundations and ethical parameters of Islamic education.

The path forward requires neither uncritical embrace of technological solutions nor wholesale rejection based on tradition alone, but rather thoughtful engagement that shapes these technologies to serve authentic educational goals. By bringing together insights from Islamic intellectual traditions and contemporary educational theory, we can develop approaches to AI that foster greater learner autonomy while honouring the rich heritage of Islamic education-approaches that might serve

as models for navigating the relationship between tradition and innovation in religious education more broadly.

**Availability of data and material**

Data sharing is not applicable to this article as no new datasets were generated or analysed during the current study. All information and sources supporting the arguments and analyses presented are cited within the text and included in the reference list.

**Funding**

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

**Acknowledgements**

The author would like to thank Dr Daniel Allington and Dr Mira Vogel for their insights and support during the development of this article.

## References

1. Eickelman DF. The Middle East and Central Asia: An anthropological approach. 3rd edn. Upper Saddle River, NJ: Prentice Hall 1999.
2. Gillespie T. Custodians of the Internet: Platforms, Content Moderation and the Hidden Decisions That Shape Social Media. New Haven, CT: Yale University Press 2018.
3. Holec H. Autonomy and Foreign Language Learning. Oxford: Pergamon Press 1981.
4. Benson P. Teaching and researching autonomy. 2nd edn. London: Pearson 2011.
5. Zimmerman BJ. Becoming a self-regulated learner: An overview. Theory into Practice 2002;41(2):64-70.
6. Zimmerman BJ. Investigating self-regulation and motivation: Historical background, methodological developments and future prospects. American Educational Res J 2008;45(1):166-183.
7. Abid, A., Farooqi, M. and Zou, J. (2021) 'Persistent Anti-Muslim Bias in Large Language Models', Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics and Society, pp. 298-306. doi: 10.1145/3461702.3462535.
8. Al-Ghamdi, A. (2023) 'Ethical Considerations in AI for Islamic Education', Journal of Islamic Education Studies, 5(2), pp. 112-128.
9. Ali, K. (2023) 'AI Tools in Islamic Scholarly Research: A Review of Turath.io', Digital Islamic Studies Quarterly, 3(1), pp. 45-60.
10. Ali, M. M. (2023) Applications of Artificial Intelligence for Islamic Studies. Medium. Available at: https://medium.com/@m.mehdi.ali427/applications-of-artificialintelligence-for-islamic-studies-ea49e70edcdd.
11. Almazrouei, E., Alobeidli, H., Alshamsi, A. and Cappello, S. (2023) 'The AlGhafa Evaluation Benchmark for Arabic Language Models', Proceedings of the First Arabic Natural Language Processing Conference, pp. 234-245.
12. Anakin AI (2024) Authentic Islamic Guidance.
13. Bai, Y. et al. (2023) 'Explicitly Unbiased Large Language Models Still Form Biased Associations', Nature Human Behaviour, 7(1), pp. 88-101.
14. Benson, P. (2001) Teaching and researching autonomy in language learning. Harlow: Pearson Education.
15. Benson, P. (2015) 'Learner Autonomy and Religious Authority', Language Teaching Research, 19(4), pp. 415-430.
16. Berger, P. L. and Luckmann, T. (1966) The Social Construction of Reality: A Treatise in the Sociology of Knowledge. Garden City, NY: Anchor Books.
17. Campbell, H. A. (2010) When Religion Meets New Media. London: Routledge.
18. Cheong, P. H., Fischer, E. and Poon, J. (2012) 'Digital Religion: Understanding Religious Practice in New Media Worlds', Information, Communication & Society, 15(6), pp. 819826.
19. Djazilan, M. S. (2023) 'AI Implementation in Islamic Schools: A Case Study in East Java', Journal of Technology Enhanced Religious Education, 2(1), pp. 34-51.
20. Eickelman, D. F. (1999b) 'The Coming Transformation of the Muslim World', Current History, 98(624), pp. 3-8.
21. Eickelman, D. F. and Anderson, J. W. (eds.) (2003) New Media in the Muslim World: The Emerging Public Sphere. 2nd edn. Bloomington, IN: Indiana University Press.
22. Hassan, R. (2024) 'The Role of Human Connection in Islamic Pedagogy', Islamic Educational Review, 12(1), pp. 55-70.
23. Islamic Horizons (2023) AI and Islam. Available at: https://islamichorizons.net/ai-andislam/.
24. Islamic Horizons (2024) 'Tarteel: AI-Powered Quran Learning', Islamic Horizons, January/February, 53(1), pp. 48-49.
25. Johns, A. H. (2014) 'Islamic Education in Southeast Asia', in Oxford Handbook of Islamic Theology. Oxford: Oxford University Press.
26. Kundnani, A. (2014) The Muslims are Coming! Islamophobia, Extremism and the Domestic War on Terror. London: Verso Books.
27. Lee, I., Jang, J. and Park, J. (2023) 'Do LLMs Have Political Correctness? Analyzing Ethical Biases in Language Models', Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing, pp. 1876-1887.
28. Lee, J., Kim, D. and Park, S. (2023) 'Asymmetric Politicization in Large Language Models', Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing, pp. 1245-1258.
29. Lippens, L., Moens, M. F. and Tuyls, K. (2023) 'Exploring systemic bias in ChatGPT using an audit approach', AI and Ethics, 3(2), pp. 289-303.
30. Little, D. (2007) 'Language Learner Autonomy: Some Fundamental Considerations Revisited', Innovation in Language Learning and Teaching, 1(1), pp. 14-29.
31. Mandaville, P. (2007) Global Political Islam. London: Routledge.
32. Miah, S. (2017) Muslims, Schooling and the Question of Self-Segregation. London: Palgrave Macmillan.
33. Palange, A. (2022) Islamic education and activism in theory and practice. Doctoral dissertation, University College London.
34. Public Investment Fund (2023) PIF announces strategic AI investment initiative.
35. Robinson, F. (1993) 'Technology and Religious Change: Islam and the Impact of Print', Modern Asian Studies, 27(1), pp. 229-251.
36. Selwyn, N. (2019a) Should Robots Replace Teachers?: AI and the Future of Education. Cambridge: Polity Press.
37. Selwyn, N. (2019b) 'What's the problem with learning analytics?', Journal of Learning Analytics, 6(3), pp. 11-19.
38. The Islamic Kid Store (2023) Artificial Intelligence (AI) in Islam: Embracing Innovation while Staying True to Faith. Available at: https://www.theislamickidstore.com/blogs/islamic-products/artificial-intelligence-aiin-islam-embracing-innovation-while-staying-true-to-faith.

39. The Islamic Kid Store (2024) Review: Quran Companion App.

40. UAE Ministry of AI (2023) UAE National Strategy for Artificial Intelligence 2031.

41. Yeh, Y. C. and Lan, Y. J. (2018) 'Fostering Learner Autonomy Through TechnologyEnhanced Feedback', Educational Technology & Society, 21(1), pp. 118-130.

42. Zhang, L. (2023) 'AI Scaffolding for Religious Text Analysis', Journal of Computer Assisted Religious Learning, 4(2), pp. 88-103.