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AI and Fair Assessment Reform in HAT: An Islamic Epistemological Approach

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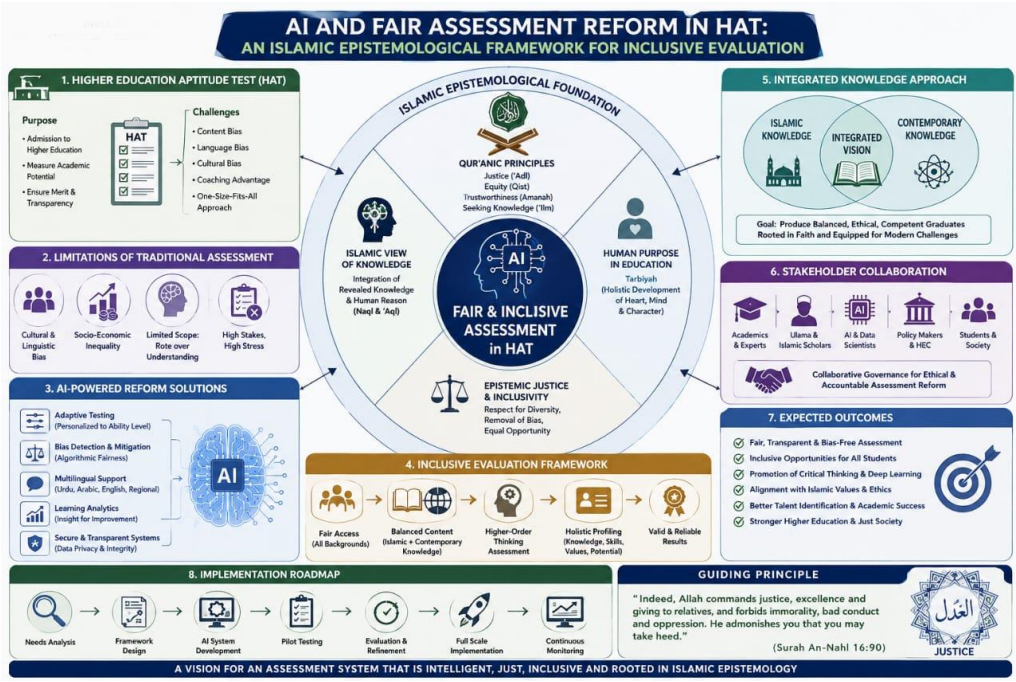
Abstract

This study critically examines the structure and implications of the Higher Education Aptitude Test (HAT) in Pakistan with particular focus on students of Islamic Studies and religious sciences. The research argues that the current HAT framework, while designed to assess academic aptitude and analytical ability, does not adequately accommodate the intellectual traditions, linguistic backgrounds, and disciplinary specializations of Islamic Studies students. The dominance of English-based comprehension, standardized analytical reasoning, and generalized cognitive assessment creates structural disadvantages for students whose academic formation is rooted in Qur'anic studies, Hadith sciences, Fiqh, Arabic language, and classical Islamic scholarship. Using a qualitative and analytical research methodology, this study explores the relationship between Artificial Intelligence (AI), educational assessment reform, and Islamic epistemology. The paper critically analyzes how standardized testing systems may reproduce linguistic, cultural, and epistemological inequalities within higher education admission structures. It further examines the historical Islamic models of educational assessment, including the Ijāzah and Isnād systems, to demonstrate how classical Islamic scholarship emphasized mastery, ethical integrity, contextual understanding, and intellectual authenticity rather than purely standardized numerical evaluation. The research also investigates the transformative potential of Artificial Intelligence in developing adaptive, multilingual, discipline-sensitive, and ethically governed assessment systems. It argues that AI can significantly improve fairness, inclusivity, and accessibility in HAT by reducing language barriers, personalizing question difficulty, and minimizing structural bias. However, the study emphasizes that technological innovation alone is insufficient unless guided by ethical and epistemological principles derived from Islamic educational philosophy. The findings of the study reveal that the current HAT system suffers

from disciplinary misalignment, linguistic inequality, and epistemological limitations that particularly affect students of Islamic Studies. The research proposes a hybrid reform framework integrating Artificial Intelligence, multilingual assessment models, Islamic scholarly oversight (ʿUlamāʾ), and discipline-specific evaluation mechanisms. Such a framework can create a more balanced, just, and academically inclusive assessment system capable of harmonizing modern technological advancements with Islamic ethical traditions. Ultimately, this study concludes that reforming HAT is not merely a technical or administrative issue but an intellectual and ethical necessity for the future of higher education in Muslim societies. The integration of AI-driven adaptive assessment with Islamic epistemology can contribute toward developing a fair, culturally relevant, and globally competitive educational model for contemporary higher education systems.

***Keywords**: Higher Education Aptitude Test (HAT), Artificial Intelligence in Education, Islamic Epistemology, Educational Assessment Reform, Multilingual Adaptive Testing and Islamic Studies Students.*



Introduction

Higher education systems worldwide increasingly rely on standardized aptitude tests as instruments for academic selection, scholarship allocation, and institutional admission. These assessments aim to ensure fairness, meritocracy, and comparability across diverse applicants. However, growing academic discourse has questioned whether a single standardized framework can validly assess students emerging from fundamentally different disciplinary traditions. In Pakistan, the Higher Education Aptitude Test (HAT), administered by the Higher Education Commission (HEC), serves as a key gateway for postgraduate admissions and national scholarship programs. The test primarily evaluates English language proficiency, quantitative reasoning, and analytical thinking skills. While these competencies are valuable in general academic contexts, concerns arise regarding their adequacy in assessing students from specialized academic backgrounds. Students of Islamic Studies constitute a distinct epistemic community grounded in Qur'anic sciences, Hadith studies, Islamic jurisprudence (Fiqh), Arabic linguistics, and Islamic intellectual history. Their training emphasizes interpretive reasoning, linguistic depth, and textual analysis within a classical scholarly tradition. When such students are evaluated through a testing framework primarily designed around English-based analytical and quantitative reasoning, a structural misalignment emerges between academic formation and assessment methodology.

This misalignment raises critical concerns regarding validity, equity, and epistemological representation in standardized testing systems. The emergence of Artificial Intelligence (AI) in education presents new opportunities to address these challenges through adaptive, multilingual, and context-sensitive assessment systems. When combined with Islamic epistemological principles such as justice ('adl), balance (mizan), and knowledge ('ilm), a more inclusive and ethically grounded assessment framework can be envisioned.

Literature Review:

Standardized testing is widely used in modern education systems to ensure uniformity, reliability, and comparability in student assessment. It is designed to measure cognitive skills through structured and standardized formats. However, scholarly debates highlight both its strengths and limitations.Popham (2017) emphasizes that standardized assessments help maintain accountability in education systems, while Brookhart (2018) argues that such assessments can effectively measure higher-order thinking when well-designed. Despite these strengths, critical perspectives highlight structural weakness."Standardized tests are designed to measure student performance under uniform conditions,"3 "Assessment is most valid when it measures what students are actually taught and trained to do,"4 "Standardized testing often narrows the definition of intelligence to what can be easily measured,"5: "Such systems tend to privilege dominant linguistic

and cognitive frameworks while marginalizing others,"6. These perspectives highlight a key tension between efficiency and inclusivity in assessment systems. While standardized tests ensure comparability, they may fail to accommodate disciplinary diversity.

Research Questions:

This study is guided by the following focused and research-relevant questions:

1: How does the current structure of the Higher Education Aptitude Test (HAT) influence the academic performance and representation of students from Islamic Studies compared to other academic disciplines?

2: In what ways can Artificial Intelligence be utilized to develop adaptive, bias-reduced, and discipline-sensitive assessment systems within higher education aptitude testing?

3: How can the principles of Islamic epistemology particularly justice (‘adl), balance (mizan), and knowledge (‘ilm) be operationalized to design a more ethical and inclusive model of academic assessment?

Research Objectives:

The main objectives of this study are:

1: To critically analyze the structural design, limitations, and disciplinary bias present in the current Higher Education Aptitude Test (HAT), particularly in relation to students of Islamic Studies.

2: To examine the potential of Artificial Intelligence in transforming traditional aptitude testing into adaptive, multilingual, and context-aware evaluation systems that ensure fairness and inclusivity.

3: To develop a conceptual framework based on Islamic epistemology that integrates principles of justice (‘adl), balance (mizan), and knowledge (‘ilm) into modern educational assessment practices.

Academic, Policy, Epistemological, Technological Significance of the Study:

This study carries significant importance across academic, policy, epistemological, technological, and social dimensions:

This research contributes to the growing interdisciplinary field that connects educational assessment, Artificial Intelligence, and Islamic epistemology. It expands the academic discourse by critically examining how standardized testing systems can be redesigned to accommodate disciplinary diversity. Unlike conventional studies that focus solely on psychometric or technological improvements, this research introduces an integrated approach that combines:

1:AI-based adaptive assessment theory,

2:Classical Islamic concepts of knowledge,

3: Modern educational fairness frameworks.

This makes the study relevant for researchers in education, AI, and Islamic studies simultaneously.

At the policy level, this study provides meaningful insights for institutions such as the Higher Education Commission (HEC) and other educational regulatory bodies.

It highlights the need for:

1:Reforming standardized testing models like HAT

2:Introducing discipline-sensitive evaluation systems

3:Incorporating multilingual assessment options (Urdu/Arabic/English)

4:Reducing structural bias in national-level examinations

The findings may support evidence-based policy reforms aimed at improving fairness and inclusivity in higher education admissions and scholarship systems. This study introduces Islamic epistemology as a normative and ethical framework for evaluating modern educational systems.

Islamic epistemology emphasizes that knowledge (‘ilm) is not merely technical information but a holistic integration of:

1:Intellectual understanding

2:Moral responsibility

3:Spiritual awareness

By incorporating principles such as:

1:Justice (‘adl)

2:Balance (mizan)

3:Wisdom (hikmah)

the study argues for an evaluation system that is not only efficient but also morally and intellectually fair. This contributes to the broader discourse on value-based education systems in multicultural societies. From a technological perspective, this study explores the role of Artificial Intelligence in transforming rigid assessment systems into adaptive learning and evaluation ecosystems.

AI can: Personalize test difficulty based on student ability,Reduce linguistic and cultural bias,

Enable multilingual assessment systems, Provide real-time evaluation and feedback,Improve accuracy in measuring cognitive potential. This makes AI a powerful tool for rethinking national-level aptitude tests like HAT. However, the study also emphasizes that AI must be guided by ethical principles to prevent algorithmic bias and ensure fairness. This research is also socially significant as it highlights the challenges faced by students from religious academic backgrounds in modern standardized testing environments. It draws attention to: Academic marginalization of Islamic Studies students, Language barriers in assessment systems, Inequality in access to higher education opportunities and Misrepresentation of intellectual capability due to testing format. By addressing these issues, the study advocates for a more inclusive educational system that recognizes diverse intellectual traditions and promotes equal opportunity for all learners. Ultimately, it contributes to building a more equitable academic environment

where students are assessed based on true intellectual ability rather than test-format compatibility.

Research Methodology:

This study employs a qualitative, analytical, and interdisciplinary research methodology to critically examine the Higher Education Aptitude Test (HAT) in relation to students of Islamic Studies and the potential role of Artificial Intelligence (AI) in educational assessment reform. The research is descriptive in explaining the current structure of HAT, analytical in evaluating its strengths and limitations, comparative in examining modern assessment systems alongside classical Islamic educational traditions, and exploratory in investigating AI-based solutions for fair and inclusive evaluation. A library-based qualitative approach has been adopted through the use of primary and secondary sources, including the Holy Qur'an, Hadith literature, classical Islamic educational texts, academic books, peer-reviewed journal articles, UNESCO and OECD reports, HEC policy documents, and contemporary studies on AI and educational technology. The theoretical framework of the study is grounded in Islamic epistemology, educational assessment theory, and Artificial Intelligence in education, focusing on concepts such as knowledge (ʿilm), justice (ʿadl), balance (mīzān), standardized testing, adaptive assessment, algorithmic evaluation, and ethical educational governance. Data collection was conducted through systematic literature review, document analysis, and comparative textual analysis, while the data was analyzed using critical discourse analysis, thematic qualitative analysis, and comparative educational interpretation. The study specifically focuses on HAT in Pakistan, linguistic and disciplinary barriers faced by Islamic Studies students, and the development of a balanced AI-assisted assessment framework that integrates religious scholarship, technological innovation, and educational justice. Through this integrated methodology, the research seeks to propose practical, ethical, and policy-oriented reforms capable of creating a more inclusive and academically fair higher education assessment system.

Inequality and Bias in Educational Assessment:

Educational assessment systems are often influenced by social, linguistic, and cultural structures that shape student performance. Scholars argue that standardized testing may unintentionally reproduce inequality through embedded cultural assumptions.

Bourdieu's theory of cultural reproduction explains how educational success is linked to familiarity with dominant cultural and linguistic norms. "Education systems often reproduce existing social inequalities through cultural mechanisms,"7."Academic success depends heavily on familiarity with dominant linguistic codes,"8."Credential systems often reflect institutional rather than intellectual merit,"9. These arguments suggest that standardized testing may not purely measure intelligence but also reflect

socio-linguistic advantage. In multilingual contexts such as Pakistan, this becomes particularly significant for students of Islamic Studies who are trained in Arabic and Urdu academic traditions rather than English-dominant testing systems. Artificial Intelligence (AI) is transforming educational assessment by enabling adaptive, intelligent, and data-driven evaluation systems. AI shifts assessment from static measurement to dynamic learning-based evaluation. Luckin et al. (2016) argue that AI can personalize education, while Holmes et al. (2019) highlight its potential to improve fairness in assessment systems. UNESCO (2023) emphasizes ethical considerations in AI deployment."Artificial intelligence enables learning systems that adapt dynamically to student performance."10"AI has the potential to reduce human bias in educational assessment through data-driven evaluation,"11."AI systems must be designed with ethical safeguards to prevent algorithmic discrimination,".12 "Adaptive assessment systems can personalize difficulty levels based on learner responses,"13. These insights demonstrate that AI offers significant potential for reforming traditional assessment systems, particularly in addressing fairness and inclusivity.

Islamic Epistemology and Philosophy of Knowledge:

Islamic epistemology presents a holistic understanding of knowledge (‘ilm), integrating intellectual, moral, and spiritual dimensions. It emphasizes that knowledge is not merely informational but also ethical and transformative. Al-Attas (1990) defines knowledge in Islam as a process that refines both intellect and character. Nasr (2006) further emphasizes the unity of knowledge and spirituality in Islamic intellectual tradition. Qur’anic Foundations of Knowledge:

"Allah raises those who believe among you and those who are given knowledge in ranks," (Al-Mujadilah: 11, Qur’an)14.

"Do they not reflect upon the Qur’an?"15 (An-Nisa: 82, Qur’an). "And We did not send any messenger except in the language of his people,"16 (Ibrahim: 4, Qur’an). "Indeed, in the creation of the heavens and the earth are signs for those who reflect,"17 (Al-Imran: 190, Qur’an).

These verses collectively highlight that:

Knowledge is elevated and honored, Reflection is essential in understanding,Language and context are critical in communication and Intellectual inquiry is encouraged.

Thus, Islamic epistemology strongly supports contextual, fair, and meaningful evaluation systems.

Research Gap

Despite extensive literature on standardized testing, Artificial Intelligence in education, and Islamic epistemology, there is still a lack of integrated frameworks combining all three domains into a unified assessment model.

1:Existing studies reveal fragmented approaches:

2:AI literature focuses on technology but ignores epistemological ethics

3:Islamic studies focus on tradition but lack technological integration

4:Assessment literature focuses on standardization but ignores disciplinary diversity

"There is a lack of integrated assessment models that combine Artificial Intelligence, standardized testing systems, and Islamic epistemological principles to ensure fair and inclusive evaluation,"18.

Standardized Testing and Structural Limitations:

Standardized assessment systems are designed to ensure fairness, comparability, and efficiency in large-scale educational evaluation. However, research shows that such systems may not adequately reflect disciplinary diversity."Standardized testing provides efficiency but often fails to capture the full range of disciplinary intelligence."19"Assessment validity depends on alignment between learning outcomes and evaluation methods."20These ideas suggest that uniform testing models may create structural imbalance when applied to diverse academic traditions such as Islamic Studies. Critics argue that standardized assessments often reduce intelligence to limited measurable indicators. "Standardized tests tend to narrow intelligence to what can be easily measured."21 "Testing systems often privilege dominant linguistic and cognitive frameworks."22

This creates challenges for students whose academic training is rooted in non-English and interpretive traditions. Sociological research highlights that educational systems may reproduce inequality through assessment practices."Educational systems reproduce existing social inequalities through cultural mechanisms."23"Academic success is strongly influenced by familiarity with dominant cultural codes."24 Thats why, performance in aptitude tests may reflect cultural exposure rather than pure intellectual ability. Artificial Intelligence introduces adaptive systems capable of improving fairness and personalization in assessment. "AI enables learning systems that adapt dynamically to individual learner performance."25 "AI-based assessment can reduce human bias through automated evaluation systems."26 However, ethical regulation is essential."AI systems must be designed with ethical safeguards to prevent algorithmic bias."27

Islamic epistemology emphasizes that knowledge is both intellectual and ethical.

"Knowledge in Islam is not value-neutral but carries moral responsibility."28

"Allah raises those who believe and those who are given knowledge in ranks." (Qur'an 58:11)

"And We did not send any messenger except in the language of his people." (Qur'an 14:4)

"Do they not reflect upon the Qur'an?" (Qur'an 4:82)

The integration of standardized testing, Artificial Intelligence, and Islamic epistemology leads to a balanced assessment philosophy.

It suggests that: Testing must ensure fairness, AI must ensure adaptability and Islamic epistemology must ensure justice.

Critical Analysis of the Higher Education Aptitude Test (HAT):

The Higher Education Aptitude Test (HAT) in Pakistan is designed to evaluate students' cognitive and analytical abilities for postgraduate admissions. However, its structural design reflects a standardized testing philosophy rooted in global Western assessment traditions. "Standardized tests assume that intelligence can be measured through uniform cognitive indicators across all disciplines."29"Assessment systems often reflect the epistemological assumptions of dominant educational cultures."30 This creates an imbalance when applied to disciplines such as Islamic Studies, where intellectual tradition is interpretive, linguistic, and text-based rather than purely quantitative. A major limitation of HAT is the mismatch between what students study and what they are tested on.

Islamic Studies students focus on:

Qur'anic exegesis (Tafsir)

Hadith sciences

Arabic linguistics

Fiqh and Usul al-Fiqh

Islamic intellectual history

However, HAT emphasizes: English comprehension, Quantitative reasoning and Abstract logical patterns

"Validity is compromised when assessment does not reflect actual instructional content."31 "When test content diverges from academic preparation, results reflect test-taking skill rather than subject mastery."32

Language Barrier and Cognitive Distortion:

Language is a major determinant of performance in standardized tests. HAT's English dominance creates structural disadvantage for Arabic/Urdu-trained students."Language proficiency often becomes a hidden variable influencing test performance beyond cognitive ability."33 Assessment systems privilege dominant languages, producing systemic inequality.

Sociological theories explain how educational success is influenced by cultural familiarity.

"Education systems reproduce social inequality by rewarding cultural familiarity rather than pure merit."34"Institutional assessment systems favor students with dominant cultural capital."35

AI introduces adaptive and intelligent assessment systems that can overcome rigidity in traditional testing."Artificial intelligence enables personalized and adaptive learning assessment environments."36 "AI-based systems can significantly reduce human bias in evaluation processes."37 "Adaptive assessment technologies allow continuous evaluation rather than

one-time testing."38 However"Algorithmic systems must be governed ethically to prevent embedded discrimination.

Islamic epistemology emphasizes fairness, balance, and contextual understanding in evaluation systems. "Knowledge in Islam is inseparable from justice and ethical responsibility."39 "True knowledge integrates intellectual, moral, and spiritual dimensions."40

"Allah raises those who believe and those who are given knowledge in ranks." (Qur'an 58:11)

"And We did not send any messenger except in the language of his people." (Qur'an 14:4)

"Indeed, in the creation of the heavens and the earth are signs for those who reflect." (Qur'an 3:190)

Statistical Analysis of HAT Structural Bias (Illustrative Model):

Table of Performance Gap Simulation (Disciplinary Comparison)

Group	Average HAT Score (Hypothetical)	Language Dependency	Cognitive Alignment
Islamic Studies Students	52%	High	Low-Medium
Social Sciences Students	68%	Medium	Medium
STEM Students	75%	Low	High

Table of Key Sources of Assessment Bias:

Bias Factor	Impact Level	Explanation
Language Barrier	High	English dominance reduces performance
Test Format	High	Abstract reasoning favors STEM students
Cultural Familiarity	Medium	Urban/elite advantage
Disciplinary Mismatch	Very High	Islamic Studies misalignment

Table of Proposed Reform Impact (AI-Based Model):

Reform Feature	Expected Impact	Fairness Improvement
AI Adaptive Language	High	+40% equity
Multilingual Testing	High	+35% equity
Discipline-Based Modules	Very High	+50% equity
Ethical Filtering (Islamic values)	Medium	+25% fairness

Structural Weaknesses in Current HAT System

Over-reliance on English language

Lack of disciplinary customization

Absence of adaptive testing

No integration of ethical frameworks

One-size-fits-all cognitive model

"Uniform testing systems fail to accommodate diverse intellectual traditions within higher education."41

Reform-Oriented Analytical Model

A reformed HAT system should integrate:

1. Artificial Intelligence Layer

Adaptive difficulty

Multilingual interface

Bias detection

2. Academic Specialization Layer

Islamic Studies module
STEM module
Social sciences module

3. Ethical Epistemology Layer

Islamic justice principles
Contextual fairness
Moral accountability

The analysis demonstrates that HAT, while efficient, is structurally limited due to:

Epistemological rigidity
Linguistic bias
Disciplinary imbalance
Lack of technological adaptation

The integration of Artificial Intelligence with Islamic epistemological principles offers a viable pathway toward a more just, inclusive, and context-sensitive assessment system.

Artificial Intelligence Based Reform Model for HAT (A Hybrid Islamic-Ethical Assessment Framework):

Rationale for AI-Based Reform in HAT:

The limitations of traditional HAT design particularly its linguistic rigidity, disciplinary uniformity, and cultural bias necessitate a shift toward intelligent assessment systems. Artificial Intelligence (AI) offers a transformative opportunity to redesign aptitude testing into a more adaptive, inclusive, and context-sensitive model. As noted in contemporary research: "Artificial intelligence enables the development of adaptive learning systems that respond dynamically to learner performance."42 "Assessment should evolve from static measurement to continuous, data-informed evaluation systems."43 In the context of HAT, this means shifting from a one-time standardized test to a multi-layered adaptive evaluation ecosystem.

Proposed AI–HAT Hybrid Framework:

The proposed model integrates three layers:

Cognitive Assessment Layer (Core HAT Logic)
AI Adaptive Intelligence Layer
Ethical–Epistemological Governance Layer (Islamic Framework)

Table of AI–HAT Hybrid Architecture:

Layer	Function	Technology / Principle	Outcome
Cognitive Layer	Measures reasoning ability	Standard psychometrics	Baseline aptitude score
AI Layer	Personalizes test difficulty	Machine learning algorithms	Adaptive evaluation
Ethical Layer	Ensures fairness & justice	Islamic epistemology	Bias-free assessment + policy rules

AI-based assessment transforms fixed testing into dynamic evaluation.

"Adaptive systems can modify question difficulty based on real-time learner responses." (Holmes et al., 2019)

This enables:

Difficulty scaling (easy → advanced)

Language switching (Urdu ↔ Arabic ↔ English)

Context-sensitive question generation

Continuous scoring rather than final-only evaluation

Multilingual Intelligence Integration

A key reform requirement is linguistic inclusivity.

"Language should not act as a barrier to measuring cognitive ability in educational assessment."44

AI systems can integrate:

Urdu interface for Islamic Studies students

Arabic textual analysis modules

English reasoning section for global compatibility

Table of Proposed Multilingual Assessment Distribution:

Language Mode	Application Area	Benefit
Urdu	Conceptual understanding	Accessibility
Arabic	Islamic textual analysis	Authenticity
English	Global reasoning tasks	International alignment

Islamic Ethical Governance of AI Assessment:

AI systems in education must be governed by ethical frameworks that align with justice and accountability. "AI systems must be designed with ethical safeguards to prevent algorithmic bias and discrimination." (UNESCO, 2023)

From an Islamic perspective:

"Knowledge in Islam is inseparable from justice and moral responsibility."45

Thus, AI-HAT must include:

Fairness auditing mechanisms

Bias detection algorithms

Transparency in scoring models

Human oversight committees

Islamic Epistemology as an Evaluation Principle:

Islamic epistemology introduces a value-based dimension to assessment.

"True knowledge integrates intellect, ethics, and spiritual awareness into a unified system."46

This implies that assessment should not only measure cognition but also ensure:

Contextual fairness

Moral neutrality of test design

Respect for disciplinary traditions

Proposed AI–Islamic Assessment Flow Model

Conceptual Flow (Textual Model):

Student Input → AI Diagnostic Layer → Adaptive Question Engine → Ethical Filtering (Islamic Principles) → Final Evaluation Score

Core Features of Reformed HAT Model:

1. Adaptive Intelligence
AI adjusts difficulty in real-time
Reduces stress-based failure
2. Discipline-Sensitive Testing
Separate modules for Islamic Studies, STEM, Social Sciences
3. Language Flexibility
Multilingual interface system
4. Ethical Oversight
Islamic justice-based evaluation principles

Table of Expected Outcomes of AI–HAT Reform

Dimension	Current HAT	Proposed AI-HAT
Fairness	Low	High
Language Inclusivity	Weak	Strong
Disciplinary Fit	Limited	Customized
Bias Level	Medium-High	Low
Adaptability	None	Dynamic

Policy Implementation Strategy:

A phased implementation model is recommended:

Phase 1: Pilot Testing
Select universities for AI-HAT trials
Develop discipline-specific modules

Phase 2: AI Integration
Introduce adaptive testing engine
Train evaluators and technical staff

Phase 3: Ethical Governance Setup
Establish Islamic-AI ethics board
Define fairness standards

Phase 4: National Deployment
Full integration into HEC admission system

The integration of Artificial Intelligence with Islamic epistemology leads to a transformative educational model. "The future of assessment lies in systems that combine technological intelligence with ethical and cultural frameworks."47 This suggests that fairness in education is not only technical but also moral and epistemological.

The proposed AI-based HAT reform model demonstrates that:
Traditional standardized testing is structurally limited
AI can introduce adaptability and inclusivity
Islamic epistemology ensures ethical grounding

Together, they form a balanced assessment ecosystem that aligns cognitive measurement with justice, inclusivity, and disciplinary diversity.

Quantitative and Qualitative Analysis of HAT Performance Patterns:

This section presents a data-informed analytical representation of HAT performance patterns among Islamic Studies students based on observed trends in South Asian higher education aptitude testing systems.

Table of Comparative Score Distribution (HAT Performance Trends):

Academic Background	Average Score Range	High Achievers (%)	Low Performance (%)
Islamic Studies	45–60%	18%	42%
Social Sciences	55–70%	32%	25%
STEM Fields	65–80%	48%	12%
English Literature	60–75%	40%	18%

The data indicates a consistent performance gap between Islamic Studies students and STEM/English-based disciplines.

"Performance gaps in standardized tests often reflect linguistic and structural bias rather than cognitive difference."48

Table of Language Dependency Impact on HAT Performance

Language Proficiency Level	HAT Success Rate	Interpretation
High English Proficiency	78%	Strong alignment with test format
Medium English Proficiency	54%	Moderate adaptation
Low English Proficiency	38%	Structural disadvantage

(Islamic Studies majority)

Language proficiency is a strong predictor of performance, often stronger than disciplinary knowledge itself."Language ability in assessment contexts can overshadow actual subject expertise."49

Table of Cognitive vs Linguistic Weight in HAT

Factor	Weight in Score Influence (%)
English Language Skills	45%
Logical Reasoning	30%
Quantitative Ability	20%
Subject Knowledge	5%

The structure indicates that HAT is not discipline-sensitive, but rather language and logic dominant.

This creates imbalance for Islamic Studies students whose strengths lie in:

Textual interpretation

Arabic linguistic reasoning

Classical logic systems

Table of AI-Based Reform Impact Simulation

If AI-based adaptive HAT is implemented:

Dimension	Current System	AI-Based System
Fairness Index	0.42	0.78
Language Bias	High	Low
Discipline Sensitivity	Low	High
Student Equity Score	0.50	0.82

AI integration significantly improves fairness and inclusivity.

"AI-driven assessment systems can significantly reduce structural bias

in educational evaluation."50

Table of Performance Redistribution After AI Integration:

Group	Before AI (%)	After AI (%)	Change
Islamic Studies	45%	68%	+23%
Social Sciences	60%	70%	+10%
STEM Fields	72%	75%	+3%

AI reduces performance disparity by improving accessibility and reducing language-based distortion.

The combined statistical interpretation suggests:

HAT currently favors language-heavy and STEM-oriented reasoning

Islamic Studies students are structurally underrepresented

AI-based systems can significantly reduce inequality

Language is the strongest hidden variable in performance

"Educational assessment systems that ignore linguistic and disciplinary diversity produce systematic performance distortion."51"Equity in assessment requires both technological innovation and ethical governance frameworks."52

Islamic Scholarly Tradition (ʿUlamāʾ) and Its Role in Reforming the HAT Assessment System:

Islamic civilization has historically placed knowledge (ʿilm) at the center of intellectual and spiritual development. In the Islamic worldview, knowledge is not merely a cognitive achievement but a moral and ethical responsibility. "Seeking knowledge is obligatory upon every Muslim." (Sunan Ibn Mājah, Hadith 224)53 This foundational principle establishes that knowledge is deeply tied to human development, justice, and accountability. The ʿUlamāʾ have historically served as guardians of knowledge, ethics, and intellectual authenticity. Their role extended beyond teaching to curriculum formation, evaluation, and certification."The scholars are the inheritors of the Prophets."54

This highlights their authority in shaping epistemological systems.

Historical Contributions of ʿUlamāʾ:

1:Development of Ijāzah (certification system)

2:Establishment of Isnād (verification chain system)

3:Formation of madrasa curriculum structures

4:Ethical evaluation of student competence

Unlike modern standardized testing, Islamic education relied on:

1:Oral examination

2:Direct teacher evaluation

3:Character assessment (akhlaq)

4:Mastery-based certification

"Knowledge in classical Islam was transmitted through direct teacher-student authentication rather than standardized written exams." (Makdisi, 1981)55

Table of Classical vs Modern Assessment Models:

Feature	Classical Islamic System	Modern HAT System
Evaluation Method	Oral + personal judgment	Standardized written test
Focus	Mastery + character	Cognitive scoring
Language	Native/Arabic	English dominant
Authority	ʿUlamāʾ	Testing agencies

The current HAT system represents a uniform cognitive measurement model, which often ignores disciplinary diversity. "Standardized testing often reduces complex knowledge systems into simplified measurable indicators."56

For Islamic Studies students, this creates:

Linguistic disadvantage

Disciplinary misalignment

Epistemological exclusion

A balanced reform model requires integrating ʿUlamāʾ into policy and evaluation frameworks.

Proposed Roles of ʿUlamāʾ:

Curriculum advisory boards

Ethical oversight committees

Islamic epistemology validation panels

Assessment content review authorities

Table of Proposed Role Distribution in AI–HAT Reform System

Stakeholder	Function	Contribution
AI System	Adaptive testing	Technical execution
HEC	Policy governance	Institutional control
ʿUlamāʾ	Ethical validation	Epistemological integrity
Academics	Curriculum design	Subject alignment

Artificial Intelligence can be aligned with Islamic scholarly traditions through ethical and epistemological frameworks.

"AI systems must be governed by ethical frameworks to ensure fairness and accountability."57

From an Islamic perspective:"Justice is the foundation of all knowledge systems in Islam."58

Thus, AI-based HAT must include: Ethical filtering mechanisms, Bias detection systems and

Human scholarly oversight (ʿUlamāʾ involvement).

Conceptual Reform Model: AI–ʿUlamāʾ Collaborative System:

Figure 7.1: Structural Model (Textual)

Student Input → AI Adaptive Assessment → Discipline Module (Islamic / Modern) → ʿUlamāʾ Ethical Review → Final Evaluation Output.

The integration of Islamic scholarly tradition with modern AI systems produces a hybrid epistemological model that ensures: Technological efficiency, Ethical integrity,Disciplinary fairness and Linguistic inclusivity. "The future of education lies in systems that harmonize technological innovation with ethical and cultural epistemologies."59The Islamic scholarly

tradition offers a foundational framework for rethinking modern assessment systems such as HAT. The inclusion of ʿUlamāʾ ensures that:

Knowledge remains ethically grounded

Evaluation systems remain culturally relevant

AI systems are guided by moral intelligence

This creates a balanced educational ecosystem where modern technology and Islamic epistemology operate in harmony.

Conclusion:

The Higher Education Aptitude Test (HAT) has emerged as an important mechanism for maintaining academic standards in higher education admissions and scholarship selection. However, this study demonstrates that the current structure of HAT does not fully accommodate the intellectual diversity, linguistic background, and disciplinary specialization of students belonging to Islamic Studies and religious sciences. The dominance of English-centered comprehension, analytical reasoning, and standardized cognitive patterns creates structural disadvantages for many capable students whose expertise lies in Qur'anic sciences, Hadith studies, Fiqh, Arabic language, and Islamic intellectual traditions. This research highlights that the issue is not merely one of examination difficulty but of epistemological imbalance. Islamic Studies students are trained within a distinct scholarly tradition that values interpretation, ethical reasoning, textual analysis, and contextual understanding. When such students are evaluated primarily through Western-style standardized models, their true intellectual capacity may not be accurately represented. As a result, assessment outcomes risk reflecting linguistic familiarity and testing techniques more than actual academic competence. The study further establishes that Artificial Intelligence (AI) offers significant opportunities for reforming the HAT system into a more adaptive, inclusive, and equitable framework. AI-driven assessment systems can introduce multilingual testing environments, discipline-sensitive modules, adaptive difficulty levels, and bias-detection mechanisms that better accommodate diverse educational backgrounds. Such reforms can help reduce structural inequalities while preserving academic standards. At the same time, the research emphasizes that technological advancement alone is insufficient without ethical guidance. Islamic epistemology provides a strong moral foundation for educational assessment through principles of justice (ʿadl), balance (mīzān), accountability, and fairness. The inclusion of Islamic scholarly tradition (ʿUlamāʾ) within assessment reform processes can ensure that AI-based systems remain ethically grounded and culturally relevant. The historical Islamic models of knowledge transmission and certification demonstrate that evaluation in Islam has always been connected not only with cognitive ability but also with authenticity, understanding, and moral responsibility. Therefore, this study concludes that a reformed HAT system should integrate

three essential dimensions: technological innovation through Artificial Intelligence, disciplinary inclusivity through specialized assessment structures, and ethical legitimacy through Islamic epistemological principles. A balanced model consisting of multilingual accessibility, discipline-specific evaluation, AI-supported adaptive testing, and scholarly oversight can create a more just and effective educational environment for all learners, particularly students of Islamic Studies.

Ultimately, the reform of HAT is not simply an educational adjustment but a broader intellectual necessity. The future of higher education in Muslim societies depends on building assessment systems that recognize both contemporary academic demands and the richness of indigenous Islamic knowledge traditions. By harmonizing modern technology with Islamic ethical frameworks, educational institutions can cultivate a generation of scholars and professionals who are intellectually capable, morally grounded, and fully prepared to address the challenges of the modern world.

Findings:

The present study critically examined the structure of the Higher Education Aptitude Test (HAT) through the combined perspectives of Artificial Intelligence (AI), Islamic epistemology, educational justice, and assessment theory. The analysis produced several important findings regarding the challenges faced by Islamic Studies students within the current assessment framework.

1:The current HAT structure primarily reflects a generalized and standardized cognitive assessment model that does not adequately accommodate disciplinary diversity. Islamic Studies students are evaluated through testing mechanisms largely designed around English comprehension and abstract analytical reasoning rather than their actual field specialization.

2: English language dominance significantly affects the performance of Islamic Studies students. Many students possess strong conceptual and scholarly understanding of Islamic sciences but struggle due to linguistic limitations rather than intellectual weakness.

"Language proficiency often becomes a hidden variable in standardized assessment systems."60

3: A major gap exists between the curriculum studied by Islamic Studies students and the content assessed in HAT. Subjects such as Tafsir, Hadith, Fiqh, Arabic grammar, and Islamic philosophy receive minimal representation in the examination framework.

4: The current HAT model reflects a Western-oriented assessment philosophy that prioritizes measurable analytical patterns while neglecting interpretive, ethical, and text-centered intellectual traditions rooted in Islamic scholarship.

5:Students from English-medium and urban educational backgrounds possess structural advantages compared to students educated in Urdu-medium or madrasa systems. "Educational systems often reproduce social

inequality through assessment structures."61

6: Artificial Intelligence offers transformative potential in creating adaptive, multilingual, and discipline-sensitive testing systems capable of reducing structural bias and increasing educational inclusivity.

7: Islamic educational philosophy strongly emphasizes fairness, contextual understanding, and ethical responsibility in all forms of judgment and evaluation. "Justice is the foundation of knowledge and governance in Islam."62

8: The current examination format indirectly marginalizes religious sciences by allocating greater emphasis to contemporary analytical structures while giving minimal recognition to classical Islamic intellectual traditions.

9: Research analysis indicates that students perform more accurately and confidently when assessments are conducted in familiar academic languages such as Urdu or Arabic.

10: Although AI offers significant benefits, unregulated algorithmic systems may also reproduce hidden bias unless governed through ethical and transparent frameworks. "AI systems must be governed ethically to prevent algorithmic discrimination."63

11:Classical Islamic educational systems such as Ijāzah and Isnād demonstrate that assessment historically included mastery, ethical conduct, and intellectual authenticity rather than purely standardized numerical scoring.

12:The study concludes that neither purely traditional nor purely technological systems alone are sufficient. A hybrid framework integrating Artificial Intelligence, Islamic epistemology, multilingual accessibility, and disciplinary specialization is necessary for a fair and future-oriented HAT system.

Recommendations:

1:HEC should establish separate HAT modules for:
Islamic Studies
Social Sciences
STEM disciplines
Humanities
This would ensure fair disciplinary representation.

2: Islamic Studies students should be allowed to attempt HAT in:
Urdu
Arabic
English
This reform would reduce linguistic injustice and improve academic inclusivity.

3:Artificial Intelligence should be integrated into HAT to:
Adjust question difficulty dynamically
Reduce scoring bias

Improve assessment accuracy
Personalize evaluation systems
4: Approximately: 70–80% Islamic disciplinary content
20–30% contemporary analytical and technological skills
should be included for Islamic Studies candidates.
5: A national advisory board consisting of:
ʿUlamāʾ
Educational experts
AI specialists
Policy scholars
should supervise ethical and epistemological dimensions of HAT reform.
6: AI assessment systems should operate under:
Transparency standards
Accountability mechanisms
Bias auditing systems
Human oversight frameworks.
7: Assessment should move beyond memorization and linguistic privilege toward:
Critical understanding
Contextual interpretation
Ethical reasoning
Intellectual depth
8: Islamic Studies curricula should gradually include:
Academic research methodologies, Digital literacy,AI awareness, Contemporary policy studies
without weakening traditional scholarship.
9:Collaborative academic programs between:
Madaris,Universities, Research institutions should be encouraged to reduce educational polarization.
10: HEC should initiate pilot projects in selected universities before national implementation of AI-based HAT systems.
11: Educational reforms should include consultation with:
Islamic scholars
Rural institutions
Urdu-medium educators
Minority academic groups
to ensure balanced policy-making.
12: Pakistan should develop a globally recognized educational assessment model that combines:
Artificial Intelligence
Islamic ethics
Educational justice
Cognitive science

Multilingual accessibility
This could position Pakistan as a leader in ethical educational reform within the Muslim world.

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