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SHARIA LEGITIMACY AND SCIENCE–RELIGION INTEGRATION IN THE ACCEPTANCE OF THE UNIFIED GLOBAL HIJRI CALENDAR (KHGT) AMONG INDONESIAN MUSLIM YOUTH

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ABSTRACT

Amid the growing urgency to unify the global Islamic calendar, the concept of a Unified Global Hijri Calendar (KHGT) faces complex sociological acceptance challenges, often hindered by a clash between normative texts and modern science. Although the discourse on calendar unification has been ongoing for a long time, there is a scarcity of quantitative research that empirically tests its

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determining epistemological factors. This study aims to analyze how insights from Islamic astronomy and the science-religion integration paradigm simultaneously shape support for the KHGT among young Muslim communities. Using a quantitative approach with the Partial Least Squares-Structural Equation Modeling (PLS-SEM) method, this study examines the science-religion integration paradigm as a crucial mediator in the relationship between three dimensions of astronomical knowledge (basic knowledge, methodological understanding, and practical application) and the acceptance and support of KHGT. Data were collected through a survey of 191 respondents in Yogyakarta who possessed adequate astronomical literacy. Key findings indicate that the direct influence of astronomical knowledge alone is insufficient to drive significant support. Conversely, the science-religion integration paradigm functions as a full mediator, wherein technical knowledge becomes an effective predictor only after being bridged by an integrative framework. This confirms that technical knowledge alone is inert without an epistemological bridge. The implications of this research are twofold. Theoretically, it validates the integration-interconnection model of socio-religious innovation adoption. Juridically, these findings offer an 'empirical fiqh' perspective affirming that the validity of applying ittiḥād al-maṭāli' (global maṭlaʿ) requires the readiness of a science-religion integration paradigm as a form of taḥqīq al manāṭ (legal context verification). In practice, the KHGT socialization strategy must shift from merely technical explanations of ḥisāb to the construction of a narrative that conveys the synergy between science and the objectives of sharia for the sake of unity among the faithful.

Keywords: *Islamic Astronomy, Science-Religion Integration, KHGT, Empirical Fiqh, Global Maṭlaʿ.*

INTRODUCTION

In an era of global interconnectedness without borders, Muslims face a civilizational paradox that highlights the urgent need for a unified and universally applicable Hijri calendar.[1] The absence of such a calendar hampers efforts to foster unity in the simultaneous observance of Islamic holy days. This challenge becomes a social dynamic among Muslims who, despite upholding the principle of solidarity, struggle to realize it in practice.[2] The resulting paradox reflects both an astronomical inconsistency and a fragmented image of Muslim unity on the global stage.[3]

More deeply, this stagnation reflects an impasse in classical *fiqh* discourse over the concept of *maṭlaʿ* (the crescent moon's zone of visibility). The dichotomous debate between *ikhtilāf al-maṭāli'* (local *maṭlaʿ*) and *ittiḥād al-maṭāli'* (global *maṭlaʿ*) often reaches a dead end because it relies solely on textual contradictions without considering epistemological shifts.[4] Therefore, the urgency of

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[1] Abdul Mufid and Thomas Djamaluddin, "The Implementation of New Minister of Religion of Brunei, Indonesia, Malaysia, and Singapore Criteria Towards the Hijri Calendar Unification," *HTS Teologiese Studies / Theological Studies* 79, no. 1 (2023): a8774, https://doi.org/10.4102/hts.v79i1.8774.; See also Tono Saksono, "Kalender Islam Global: Perspektif Syariah, Ekonomi, dan Politik," *JURIS (Jurnal Ilmiah Syariah)* 15, no. 2 (2016): 143–52.

[2] Muhammad Alwi Musyafa and Siti Tatmainul Qulub, "Urgensi Penyatuan Kalender Hijriah Global," *Elfalaky: Jurnal Ilmu Falak* 5, no. 2 (2021): 256–65.

[3] Tiara Aliya Azzahra, "Ketum PP Muhammadiyah Serukan Hijrah Ke Kalender Islam Global Tunggal," Detikcom, accessed on July 10, 2025, https://news.detik.com/berita/d-7431125/ketum-pp-muhammadiyah-serukan-hijrah-ke-kalender-islam-global-tunggal.

[4] Susiknan Azhari, "Cabaran Kalendar Islam Global di Era Revolusi Industri 4.0," *Jurnal Fiqh* 18, no. 1 (2021): 117–34, https://doi.org/10.22452/fiqh.vol18no1.4.; See also Marwadi, Rina Heriyanti, dan Farah Nuril Izza, "The Fiqh of Hisab-Ru'ya in the Twentieth Century Indonesia: Study on the Thoughts of Hamka, Hasbi Ash-Shiddieqy, and Moenawar Chalil about the Unification of Hijri Calendar," *Al-Manahij: Jurnal Kajian Hukum Islam* 17, no. 1 (2023): 13–26, https://doi.org/10.24090/mnh.v17i1.7902.

calendar unification can no longer be approached merely as an administrative or political issue, but rather as an empirical *fiqh* challenge (how the context of reality applies).[5] This study proposes the idea that the validity of applying the global *maṭlaʿ* to the Unified Global Hijri Calendar (KHGT) requires contextual verification (*taḥqīq al-manāṭ*) through a paradigm of science-religion integration in society. Without this paradigm, the concept of the global *maṭlaʿ* will continue to be rejected sociologically, even if it is astronomically valid.

To address this fragmentation, religious scholars and astronomers convened at the International Conference on the Unification of the Hijri Calendar in Istanbul, Turkey, in 1437 AH (2016 CE), where they agreed upon the necessity of establishing a unified Islamic calendar system.[6] One of the most prominent and systematic proposals arising from this initiative is the Kalender Hijriah Global Tunggal (KHGT), or Unified Global Hijri Calendar, which officially commenced on 25 June 2025, corresponding to 1 Muharram 1447 AH. As a product of contemporary ijtihad, KHGT is intended to fulfill the principle of "one day, one date" for Muslims worldwide.[7]

The KHGT is defined as a unified calendrical system grounded in five core principles. It emphasizes the alignment of days and dates across the globe, the exclusive application of contemporary astronomical calculation (*ḥisāb*), and the adoption of the concept of *ittiḥād al-maṭāli'*, whereby the entire surface of the

[5] Mourad Laabdi, "Ilm Al-Ikhtilāf in Modern Western and Muslim Studies of Juristic Disagreement–A Critical Analysis," *Journal of College of Sharia and Islamic Studies* 42, no. 2 (2024): 185–210, https://doi.org/10.29117/jcsis.2024.0389.

[6] Syamsul Anwar, *Studi Hukum Islam Kontemporer Bagian Dua* (Yogyakarta: UAD Press, 2019); See also; Susiknan Azhari, "Kalender Uhadi dan Kalender Tawlifi: Sebuah Pilihan Menuju Penyatuan," IBTimes, accessed on May 5, 2025, https://ibtimes.id/kalender-uhadi-dan-kalender-tawlifi-sebuah-pilihan-menuju-penyatuan/.

[7] Pimpinan Pusat Muhammadiyah, *Keputusan Pimpinan Pusat Muhammadiyah Nomor 86/KEP/I.0/B/2025 tentang Tanfidz Pengembangan Pedoman Hisab Muhammadiyah tentang Kalender Hijriah Global Tunggal* (Yogyakarta: Pimpinan Pusat Muhammadiyah, 2025).

Earth is treated as a single calendrical zone. Furthermore, it applies the principle of *imkanur ru'yah* the global visibility of the crescent moon and refers to the international date line as the starting point of the day. [8] In its implementation, a new lunar month begins simultaneously across the world once *imkanur ru'yah* is confirmed in any part of the Earth before 00:00 Coordinated Universal Time (UTC).[9] This condition is defined by strict astronomical parameters: a minimum crescent elevation of 5 degrees above the horizon and a minimum elongation angle (the angular distance between the moon and the sun) of 8 degrees. [10] Accordingly, KHGT serves as a predictive, accurate, and universal calendrical system, shifting the traditional paradigm of localized or national time reckoning (*wilāyat al-ḥukm*) toward a truly global model.[11]

Despite KHGT's scientific precision and theoretical soundness, its acceptance cannot be assumed, especially in countries with complex Islamic dynamics such as Indonesia. This reality forms the central premise of the current study, which addresses a significant research gap. The study offers a novel contribution by employing a quantitative method through structural equation modeling to empirically explore the conceptual intersections of five key domains: Islamic astronomical literacy, the paradigm of religion–science integration, public understanding of KHGT, the response of young Muslim communities, and the influence of Islamic organizational dynamics within Indonesia.[12] The focus on

[8] Ilham, "Muhammadiyah Dorong Kalender Hijriah Global Tunggal Untuk Persatuan Umat Islam," Muhammadiyah, accessed on July 10, 2025, https://muhammadiyah.or.id/2025/06/muhammadiyah-dorong-kalender-hijriah-global-tunggal-untuk-persatuan-umat-islam/.

[9] Pimpinan Pusat Muhammadiyah, *The Unified Global Hijri Calendar* (Yogyakarta: The Central Board of Muhammadiyah, 2025), 26.

[10] Susiknan Azhari, "Diseminasi Kalender Hijriah Global Tunggal," Media Indonesia, accessed on March 5, 2025, https://mediaindonesia.com/opini/749003/diseminasi-kalender-hijriah-global-tunggal.

[11] Ilham, "Prinsip Ittihad Al-Matāli' Untuk Kalender Hijriah Sesuai Syariat dan Sains," Muhammadiyah, accessed on July 2, 2025, https://muhammadiyah.or.id/2025/07/prinsip-ittihad-al-matali-untuk-kalender-hijriah-sesuai-syariat-dan-sains/.

[12] Susiknan Azhari, "Cabaran Kalendar Islam Global di Era Revolusi Industri 4.0," *Jurnal Fiqh* 18, no. 1 (2021): 117–34, https://doi.org/10.22452/fiqh.vol18no1.4.; See also Holis, Ahmad

young Muslims is deliberate, as this demographic occupies a strategic position at the intersection of traditional values and modern scientific understanding. The study aims to provide an evidence-based roadmap for identifying the factors that shape the acceptance and support of KHGT, ultimately contributing to the aspiration of calendrical unity for the global Muslim community.

LITERATURE REVIEW

The discourse on the unification of the Hijri calendar has shifted from the technical-astronomical realm to a complex socio-religious arena, with its clearest manifestation in Indonesia.[13] The methodological dualism between *ḥisāb* and *ru'yah* has become a symbol of deep-rooted identity contestation. This has evolved into a more fundamental clash of paradigms between the concept of the global *maṭlaʿ*, which serves as the framework for the KHGT system, and local and national jurisdictions.[14]

From the perspective of integrative contemporary *fiqh*, the global *maṭlaʿ* is a manifestation of epistemological unity.[15] Modern astronomy serves as a *bayān* (explanation) that deconstructs the boundaries of territorial jurisdictions (*wilāyat al-ḥukm*), which form the basis of classical local *maṭlaʿ*.[16] Thus, rejecting the global *maṭlaʿ*

Musadad, and Tri Pujiati, "The Role of Public Law in Determining the Islamic Calendar in Indonesia," *Al-Hilal: Journal of Islamic Astronomy* 7, no. 1 (2025): 1–18.

[13] Hamdun, "Upaya Penyatuan Kalender Islam Internasional Oleh Organisasi Kerjasama Islam (OKI)," *Jurnal Bimas Islam* 10, no. 3 (2017): 473–516.

[14] Ilham Majid, "Studi Komparasi Konsep Kalender Hijriyah Global Tunggal (KHGT) Muhammadiyah dan Kriteria Neo Mabims di Indonesia: Perspektif Fiqh dan Astronomi," *Jurnal Antologi Hukum* 4, no. 2 (2024): 387–402, https://doi.org/10.21154/antologihukum.v4i2.4072., See also; Muhammad Hidayat et al., "Problem and Solutions for Accepting a Single Global Islamic Calender," *Journal of Law & Governance* 7, no. 1 (2024): 63–72.

[15] Muhammad Rasywan Syarif et al., "The Transformation of Rukyah Al-Hilal: Integrating Digital Imaging Technology in Islamic Moon Sighting Practices," *Malaysian Journal of Syariah and Law* 13, no. 1 (2025): 314–24, https://doi.org/10.33102/mjsl.vol13no1.751.

[16] Muhamad Syazwan Faid et al., "Methods in Determining New Hijri Month: A Thematic Review from Islamic Jurisprudence Perspective,"

in the era of digital connectivity and astronomical precision can be viewed as an epistemological error in *ijtihad*, where science should expand the definition of '*ru'yah'* from local visual observation to global scientific visibility.[17]

This core challenge highlights the absence of a robust epistemological bridge to unify diverse perspectives. [18] Consequently, previous research has identified two major limitations hindering the emergence of solutions.[19] First, there is a lack of large-scale empirical evidence regarding the factors influencing public acceptance.[20] Second, the limited application of science-religion integration frameworks to bridge understanding, particularly among younger generations growing up amid exposure to scientific information and religious values.[21]

Malaysian Journal of Syariah and Law 13, no. 1 (2025): 75–99, https://doi.org/10.33102/mjsl.vol13no1.687.

[17] Mohammaddin Abdul Niri et al., "Astronomy Development since Antiquity to Islamic Civilization from the Perspective of Islamic Historiography," *Journal of Al-Tamaddun* 18, no. 1 (2023): 169–77, https://doi.org/10.22452/JAT.vol18no1.14.

[18] Muh Rasywan Syarif, "Ikhtiar Akademik Mohammad Ilyas Menuju Unifikasi Kalender Islam Internasional," *ELFALAKY: Jurnal Ilmu Falak* 1, no. 1 (2017): 19–29, https://doi.org/10.24252/ifk.v1i1.6430.

[19] Susiknan Azhari, "Karakteristik Hubungan Muhammadiyah dan NU dalam Menggunakan Hisab dan Rukyat," *Al-Jami'ah: Journal of Islamic Studies* 44, no. 2 (2006): 453–86, https://doi.org/10.14421/ajis.2006.442.453-485. See also; Anisah Budiwati, "Telaah Awal Kalender Hijriah Global Tunggal Jamaluddin 'Abd al-Razik: Sebuah Upaya Menuju Unifikasi Kalender," *Jurnal Bimas Islam* 10, no. 3 (2017): 407–30, https://doi.org/10.37302/jbi.v10i3.29.

[20] Vivit Fitriyanti, Akhmad Haries, and Abd Syakur, "The Triple Helix Theory as a Solution for the Unification of the Hijri Calendar in Indonesia," *Jurnal Al-Fikrah* 13, no. 2 (2024): 202–24, https://doi.org/10.54621/jiaf.v13i2.871.

[21] Muhammad Alwi Musyafa and Siti Tatmainul Qulub, "Urgensi Penyatuan Kalender Hijriah Global," *Elfalaky: Jurnal Ilmu Falak* 5, no. 2 (2021): 256-65. See also Muhammad Hasan, "Ide Perilaku dan Apresiasi Masyarakat Pontianak Terhadap Unifikasi Kalender Hijriah," *Al-Tahrir: Jurnal Pemikiran Islam* 15, no. 1 (2015): 179–200, https://doi.org/10.21154/al-tahrir.v15i1.167.

Contesting *Maṭlaʿ* in *Fiqh*: Between *Ikhtilāf al-Maṭāli'* and *Ittihād al-Maṭāli'* in the Context of Global Calendar Reform

Etymologically, the word *matlak* or *maṭla'*, meaning "place of rising." In astronomy, *maṭlaʿ* refers to the geographic region used as a reference point in determining the validity of a crescent moon sighting. Discussions regarding *maṭlaʿ* arose when scholars asked whether a crescent moon sighting in one region is also valid in another. In *fiqh* literature, there are two main approaches to addressing this issue. The first opinion states that each region has its own local *maṭlaʿ*. Therefore, a crescent moon sighting in one region does not apply to another distant region. This view is known as *ikhtilāf al-maṭāli'*.[22]

The primary evidence frequently cited is the hadith narrated by Imam Muslim regarding the crescent sighting between Syria and Medina. In this hadith, Kuraib reported to Ibn Abbas that the Ramadan crescent had been sighted in Syria on Friday night. However, Ibn Abbas stated that the people of Medina did not see the crescent until Saturday night, so they continued fasting based on the sighting in Medina. Ibn Abbas responded by explaining, "We saw the crescent on Saturday night, so we will continue fasting until we complete thirty days or see the crescent." [23] Some scholars

[22] Among jurists, there are differing opinions regarding the definition of *maṭlaʿ* (*taḥdīd al-masāfah*). In the Shafi'i, there are at least three main approaches. *First*, an approach based on the geographical distance between regions, categorizing them as near or far. *Second*, an approach based on similarities in geographical or climatic conditions. *Third*, an approach that considers other contextual factors, such as the unity of political authority and the ease of law enforcement. These differences indicate that the concept of *maṭlaʿ* in the *fiqh* tradition is not singular, but rather open to social constructions and practical considerations that develop within specific contexts. See: Abū Zakariyyā Yaḥyā bin Sharaf al-Nawawī, *al-Majmūʿ Sharḥ al-Muhadhdhab lil-Shīrāzī*, ed. by Muḥammad Najīb al-Muṭīʿī (Jeddah, Saudi Arabia: Maktabat al-Irshād, 1980), 6:280. See also; Wahbah al-Zuḥaylī, *al-Fiqh al-Islāmī wa-Adillatuhu* (Beirut: Dār al-Fikr, 1985), 2:607. See also; Arwin Juli Rakhmadi Butar-Butar, *Matlak & Kalender Islam Global: Tinjauan Mazhab, Literatur, dan Tokoh* (Medan: UMSU Press, 2025), 6.

[23] Muslim bin al-Ḥajjāj al-Naysābūrī, *Saḥīḥ Muslim: Wa Huwa al-Musnad al-Ṣaḥīḥ*, ed. oleh Markaz al-Buḥūth wa-Taqniyat al-Maʿlūmāt (Cairo, Egypt: Dār al-Taʾṣīl, 2014), 1:430.

understand this hadith as evidence that a sighting need not follow a sighting in one region in other regions. The majority of Shafi'i scholars adopt this opinion, which serves as the basis for local practices in many regions of the Islamic world.

The second opinion states that if the crescent moon has been sighted in a particular region, then that sighting applies to all Muslims. This opinion is known as *ittihād al-maṭāli'*. This view is strengthened by the hadith: "Fast because you see it and break your fast because you see it," which is general in nature and not limited to a specific region. From this perspective, the global *maṭla'* emphasizes the unity of the Muslim community in determining the beginning of the lunar month. Muslims in the eastern regions may follow the results of the *ru'yah* conducted in the western regions, provided that the determination of the crescent's visibility is accurate and verifiable. This opinion was, among others, put forward by Al-Hashkafy (d. 1088 AH/1677 CE), a prominent figure of the Hanafi school, through his work *al-Durr al-Mukhtār Sharḥ Tanwīr al-Abṣār wa Jāmi' al-Biḥār*. In this work, he affirmed the principle of the unity of the *maṭla'* in determining the beginning of the lunar month.

Meanwhile, among the Maliki scholars who support the global *maṭla'* are Ibn Juzay (d. 741 AH/1340 CE), a prominent figure of the Maliki school, in his work al-Qawānīn al-Fiqhiyyah. He asserts that if the crescent moon has been proven to be sighted in a particular region, then that ruling applies universally. Additionally, Al-Qarafi (d. 684 AH/1285 CE), Ibn 'Abd al-Barr (d. 463 AH/1070 CE), and Abu Barakat Ahmad al-'Adawiy al-Maliky (d. 1201 AH/1786 CE) are also among the Maliki scholars who accepted the global *maṭla'*.[24]As for the Hanbali school, figures who supported the global *maṭla'* include Al-Bahuti (d. 1051 AH/1641 CE) and Ibn Qudamah (d. 620 AH/1223 CE). In addition, several exegetes and contemporary figures also support the use of the global *maṭla'*, such as Fakhr al-Din al-Razi (d. 604 AH/1207 CE), Muhammad Ali al-Sayis (d. 1396 AH/1976 CE), Ahmad Muhammad Syakir (d. 1377 AH/1958 CE), Hasbi ash -Shiddieqy (d. 1395 AH/1975 CE), Muhammad Nashiruddin al-Albani (d. 1420

[24] Butar-Butar, *Matlak & Kalender Islam Global: Tinjauan Mazhab, Literatur, dan Tokoh*, 175.

AH/1999 CE), Muhammad bin Shalih al-Utsaimin (d. 1421 AH/2001 CE),[25] and Abdul Halim Bin Abdul Aziz.[26]

Although the concept of a global *maṭlaʿ* is an important perspective in Islamic jurisprudence, in practice, the local *maṭlaʿ* has become the dominant phenomenon. This is closely related to geographical conditions and the limitations of past communication technology. In classical times, information about the crescent moon could not be transmitted quickly from one region to another. Therefore, each region conducted its own sighting to determine the beginning of the month. With the development of modern nations, the concept of *maṭlaʿ* subsequently evolved into several forms: local (national), regional, and global.[27]

In the modern world, advances in astronomy and communication technology have enabled the development of a more comprehensive Hijri calendar that can unite Muslims worldwide. One idea gaining traction in contemporary discourse is the KHGT, which is based on the concept of a global reference point. This concept was formulated at a conference in Istanbul, Turkey, in 1437 AH/2016 CE, attended by representatives from 60 countries. With a unified calendar system, Muslims across countries can observe religious observances simultaneously, thereby strengthening a sense

[25] Butar-Butar, *Matlak & Kalender Islam Global: Tinjauan Mazhab, Literatur, dan Tokoh*, 129.

[26] Abdul Halim bin Abdul Aziz emphasizes that MABIMS, which has so far been relatively successful in harmonizing the Hijri calendar at the regional level, is well-positioned to lead the initiative to develop a uniform global Hijri calendar. He argues that historically, the concept of *maṭlaʿ* has been more local in nature and influenced by the geopolitical configurations of its time. Therefore, a conceptual reinterpretation toward a global *maṭlaʿ* is needed in response to scientific developments and global connectivity. Within this framework, the hadith of Ibn ‘Abbas is not understood as a rejection of a global *maṭlaʿ*, but rather as a reflection of the political and communication conditions of that period. See: MABIMS, “Resolusi Muzakarah Falak Peringkat MABIMS Tahun 2025” (Seremban, Negeri Sembilan, Malaysia: MABIMS, 2025).

[27] Muhammad Ridzuan Hashim et al., “Unification of Hijri Calendar Under One Maṭla’: A Case Study of MABIMS Through the Lens of Islamic Jurisprudence and Astronomy,” *Jurnal Fiqh* 22, no. 2 (2025): 389–433, https://doi.org/10.22452/fiqh.vol22no2.7.

of unity as a single *ummah*.[28] The KHGT carries symbolic and structural dimensions related to efforts to build collective consciousness among Muslims. This unity of time has the potential to serve as a foundation for strengthening cooperation in other fields. If Muslims can establish a shared system in a relatively simple matter, such as the calendar, opportunities to strengthen cooperation in economics, production, education, and global strategy will also become increasingly accessible. In the long term, this could help the Islamic world reduce its dependence on external powers and strengthen its collective position in the global arena.[29]

Nevertheless, it is important to recognize that the KHGT cannot immediately resolve geopolitical conflicts, differences in national interests, or the various structural issues faced by the Muslim community.[30] However, this concept still holds strategic value as an initial step toward fostering unity within the Muslim community through a rational, scientific approach. In an increasingly fragmented world, every effort toward integration holds significant meaning. KHGT can be viewed as one of the intellectual and civilizational endeavors to build a bridge of unity for the Muslim ummah. Although it originates from the technical aspect of the calendar, its impact can extend to the formation of the

[28] The work edited by Mustafa Dadash is a comprehensive documentation of the Mu'tamar Tawḥīd al -Taqwīm al-Hijrī al-Muwaḥḥad (International Congress on the Unified Hijri Calendar) held on 21–23 Sha'ban 1437 AH/28–30 May 2016 CE in Istanbul, Turkey. This publication encompasses the full spectrum of the discourse that unfolded, ranging from official opening remarks and the organizing committee's introduction to a statement by Turkish religious authorities as hosts, to academic presentations by speakers and critical responses from participants. This work holds significant epistemological value as a documentary foundation for the conceptual construction of the Unified Global Hijri Calendar within contemporary discourse. See Mustafa Dadash, ed., "Mu'tamar Tawḥīd Al-Taqwīm al-Hijrī al-Muwaḥḥad," *International Congress on the Unified Hijri Calendar* (Istanbul, Turkey: Diyanet İşleri Başkanlığı, 2016).

[29] Musyafa and Qulub, "Urgensi Penyatuan Kalender Hijriah Global," 256-65.

[30] Aspar, Sumartini, and Muktashim Billah, "Kalender Hijriah Global Tunggal Dan Tantangan Penerapannya di Indonesia," *Jurnal Pendidikan Agama Islam* 5, no. 1 (2026): 131–37.

ummah's collective consciousness in facing the challenges of the times.[31]

Acceptance and Support for a Unified Global Hijri Calendar (KHGT)

The dissonance surrounding Islamic calendrical practices can be addressed by promoting comprehensive public literacy in Islamic astronomy (*'ilm al-falak*).[32] This literacy includes procedural knowledge of how *hisab* (astronomical calculation) and *ru'yah* (crescent sighting) function, a deep understanding of the astronomical principles that underpin them, scientifically objective criteria for crescent visibility, and an awareness of the social and civilizational urgency for a unified calendrical system.[33] The central idea is that mastery of Islamic astronomical knowledge fosters a more rational and appreciative religious perspective toward religion–science integration. This, in turn, is expected to increase trust in scientific authority and cultivate a positive attitude toward innovation.[34]

Islamic astronomical literacy functions as an essential "translator," capable of converting qualitative *fiqh* concepts into quantifiable, empirical parameters—such as the moon's altitude or elongation angle—that can be measured, verified, and predicted. In this sense, Islamic astronomy serves as a meeting point between *fiqh*, which provides normative goals and legitimacy, and science, which offers mechanisms and precision. Thus, astronomical insight illustrates how science may serve as an instrument for realizing the substantive intent of Islamic legal commands *(maqāṣid al-sharī'ah*).

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[31] Majid, "Studi Komparasi Konsep Kalender Hijriyah Global Tunggal (KHGT) Muhammadiyah dan Kriteria Neo Mabims di Indonesia: Perspektif Fiqh Dan Astronomi."

[32] Syamsul Anwar, "Unifikasi Kalender Hijriah Global: Problems dan Tantangan," *Al-Marshad: Jurnal Astronomi Islam dan Ilmu-Ilmu Berkaitan* 2, no. 2 (2016): 147–61.

[33] Muhammad Akbar Herman, Qadir Gassing, and Muhammad Shuhufi, "Kontroversi Hisab dan Rukyat Dalam Penentuan Kalender Islam di Era Modern: Pendekatan Fikih Kontemporer," *Media Hukum Indonesia* 2, no. 4 (2024): 617–25, https://doi.org/10.5281/zenodo.14253182.

[34] Saksono, "Kalender Islam Global: Perspektif Syariah, Ekonomi, dan Politik."

Empirically, the hypothesis testing the direct influence of Islamic astronomical literacy is structured across three dimensions: the Islamic Astronomy Knowledge Base (BPAI), Understanding of *Ḥisāb*, *Ru'yah*, and Crescent Visibility (HRVH), and Utilization of the Hijri Calendar System (PSKH), each in relation to the acceptance and support of the Unified Global Hijri Calendar (KHGT). The direct hypotheses are as follows:

- **H1.** The Islamic Astronomy Knowledge Base (BPAI) has a direct and significant effect on KHGT Acceptance (PKHGT).
- **H2.** The Islamic Astronomy Knowledge Base (BPAI) has a direct and significant effect on KHGT Support (DKHGT).
- **H3.** Understanding of *Ḥisāb*, *Ru'yah*, and Crescent Visibility (HRVH) has a direct and significant effect on KHGT Acceptance (PKHGT).
- **H4.** Understanding of *Ḥisāb*, *Ru'yah*, and Crescent Visibility (HRVH) has a direct and significant effect on KHGT Support (DKHGT).
- **H5.** Utilization of the Hijri Calendar System (PSKH) has a direct and significant effect on KHGT Acceptance (PKHGT).
- **H6.** Utilization of the Hijri Calendar System (PSKH) has a direct and significant effect on KHGT Support (DKHGT).

Religion–Science Integration: Meaning and Hypotheses

Although Islamic astronomical literacy is a critical prerequisite, its influence on KHGT acceptance and support is not always direct. This study further identifies a mediating variable that serves as a "cognitive and epistemological bridge." The paradigm of Religion–Science Integration (SIA), as proposed by M. Amin Abdullah (2006),[35] is positioned as a crucial mediator in this research. SIA is understood as a variable that bridges revelation (*naṣṣ*) and empirical

[35] M. Amin Abdullah, *Islamic Studies di Perguruan Tinggi: Pendekatan Integratif-Interkonektif* (Yogyakarta: Pustaka Pelajar, 2006), 50.

science, treating them not as separate realms but as interwoven discourses of knowledge that dynamically enrich each other.[36]

Within the context of KHGT, the SIA paradigm provides an ego-support mechanism that enables individuals to translate technical astronomical knowledge into full acceptance without perceiving a compromise of their religious values.[37] It facilitates the linkage between scriptural authority (*naṣṣ*) and the legitimacy of scientific data.[38] KHGT, as a "product of civilization," emerges from an integrative epistemological framework grounded in scientific *ijtihād*, using reason and knowledge in pursuit of universal welfare mandated by Islamic teachings.[39] The mediating role of SIA is hypothesized as a key to explaining how astronomical insight can effectively transform into acceptance and support for KHGT. The indirect hypotheses are as follows:

H7. The relationship between the Islamic Astronomy Knowledge Base (BPAI) and KHGT Acceptance (PKHGT)

[36] M. Amin Abdullah, "Religion, Science, and Culture: An Integrated, Interconnected Paradigm of Science," *Al-Jami'ah: Journal of Islamic Studies* 52, no. 1 (2015): 175–203, https://doi.org/10.14421/ajis.2014.521.175-203.

[37] M. Amin Abdullah, *Islamic Studies Dalam Paradigma Integrasi-Interkoneksi: Sebuah Antologi* (Yogyakarta: SUKA-Press, 2007), 30. See also; Dewi Masyitoh et al., "Amin Abdullah dan Paradigma Integrasi-Interkoneksi," *Jurnal Sains Sosial dan Humaniora (JSSH)* 4, no. 1 (2020): 81–88, https://doi.org/10.30595/jssh.v4i1.5973.

[38] Nisa A.-Zahro Jauzaa' and Rustam Ibrahim, "Scientific Integration of Perspectives M. Amin Abdullah (Integrative-Interconnective Approach)," *Al-Afkar: Journal for Islamic Studies* 8, no. 1 (2025): 298–306.; Mohamad Yamin, Nanat Fatah Natsir, and Erni Haryanti, "Jaring Laba-Laba, Interaksi-Interkoneksi Universitas Islam Negeri Sunan Kalijaga Yogyakarta," *JIIP - Jurnal Ilmiah Ilmu Pendidikan* 5, no. 1 (2022): 302–309, https://doi.org/10.54371/jiip.v5i1.413.

[39] M. Amin Abdullah, *Multidisiplin, Interdisiplin, & Transdisiplin: Metode Studi Agama & Studi Islam di Era Kontemporer* (Yogyakarta: IB Pustaka, 2021), 25. See also Khafifatul Fian, Gangsar Edi Laksono, and Muhammad Masruri, "The Concept Integration of Science and Theology M. Amin Abdullah's Perspective," *Ijtimā Iyya Journal of Muslim Society Research* 9, no. 2 (2024): 185–98, https://doi.org/10.24090/ijtimaiyya.v9i2.10228.

is mediated by the Religion–Science Integration (SIA) variable.

H8. The relationship between the Islamic Astronomy Knowledge Base (BPAI) and KHGT Support (DKHGT) is mediated by the Religion–Science Integration (SIA) variable.

H9. The relationship between Understanding of *Ḥisāb*, *Ru'yah*, and Crescent Visibility (HRVH) and KHGT Acceptance (PKHGT) is mediated by the Religion–Science Integration (SIA) variable.

H10. The relationship between Understanding of *Ḥisāb*, *Ru'yah*, and Crescent Visibility (HRVH) and KHGT Support (DKHGT) is mediated by the Religion–Science Integration (SIA) variable.

H11. The relationship between Utilization of the Hijri Calendar System (PSKH) and KHGT Acceptance (PKHGT) is mediated by the Religion–Science Integration (SIA) variable.

H12. The relationship between Utilization of the Hijri Calendar System (PSKH) and KHGT Support (DKHGT) is mediated by the Religion–Science Integration (SIA) variable.

METHODOLOGY

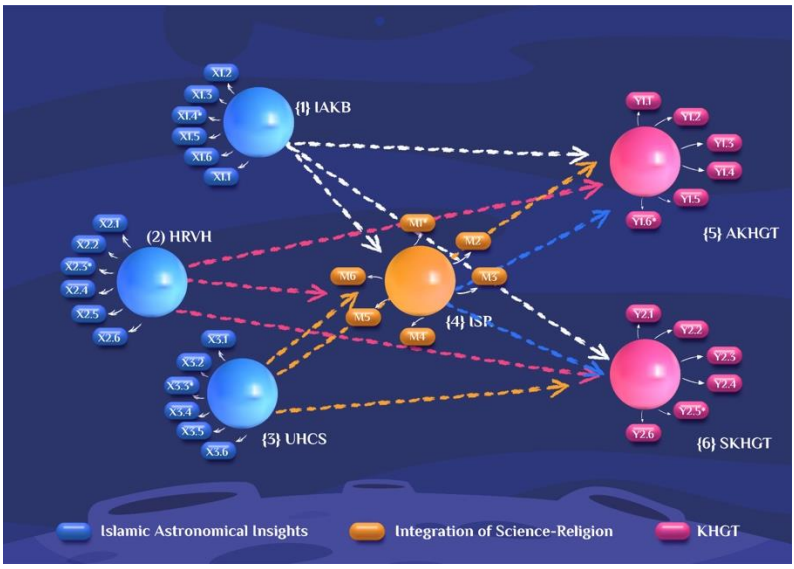
This study employs three main constructs. The first construct involves exogenous variables consisting of three dimensions of Islamic astronomical literacy. The second construct includes endogenous variables, representing responses to KHGT across two dimensions. The third construct introduces a mediating variable religion–science integration. To analyze this complex relational model, the study adopts the Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach. [40] PLS-SEM is a second-generation multivariate analysis technique well-suited for testing

[40] Reuben M. Baron and David A. Kenny, "The Moderator–Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology* 51, no. 6 (1986): 1173–82, https://doi.org/10.1037/0022-3514.51.6.1173.

theories with complex causal modalities and does not require strict assumptions about data distribution.[41] All items in the questionnaire were measured using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Variable Measurement

Figure 1.0: Conceptual Framework of Variable Measurement



The exogenous variable, Islamic astronomical literacy, is operationalized through three dimensions. The first dimension, Islamic Astronomy Knowledge Base (6 items), measures fundamental understanding of astronomical principles within an Islamic framework. The second dimension, *Ḥisāb*, *Ru'yah*, and Crescent Visibility (6 items), measures respondents' knowledge of the methods used to determine the beginning of lunar months. The third dimension, Utilization of the Hijri Calendar System (6 items), measures awareness of the function and significance of the Islamic

[41] Joseph F. Hair et al., "When to Use and How to Report the Results of PLS-SEM," *European Business Review* 31, no. 1 (2019): 2–24, https://doi.org/10.1108/EBR-11-2018-0203.

calendar. The endogenous variable, response to KHGT, comprises two dimensions. The first is KHGT Acceptance (6 items), which measures cognitive and affective agreement with the concept of calendar unification. The second is KHGT Support (6 items), which measures willingness and actual behavior in promoting the implementation of KHGT. The mediating variable, Religion–Science Integration, is measured using 6 items adapted from M. Amin Abdullah's (2006) epistemological framework, designed to assess perceptions of a synergistic relationship between science and religion.[42]

Data Collection and Analysis

The data for this study were collected online between May 13 and June 5, 2025. Respondents were voluntary participants selected through purposive sampling from a population of students at Sunan Kalijaga State Islamic University Yogyakarta who had completed coursework in Islamic astronomy (*'ilm al-falak*). Prior to the wide distribution of the questionnaire, two stages of preliminary testing were conducted. First, a pilot study, which included both validity and reliability testing, was carried out with a sample of 40 respondents. The results showed that all items were valid and reliable, with Cronbach's alpha values for each construct exceeding the threshold of 0.70.[43] Additionally, multicollinearity testing was performed to ensure that the data were free from multicollinearity problems. The resulting Variance Inflation Factor (VIF) values for each item were below the recommended threshold, indicating the absence of multicollinearity.

Second, the minimum required sample size was determined using the G*Power software for multiple linear regression analysis. By applying a significance level of 0.05 and a statistical power level of 0.95, the minimum required sample size was calculated to be 129.[44] The actual number of respondents (N = 191) met and exceeded

[42] Abdullah, *Islamic Studies di Perguruan Tinggi: Pendekatan Integratif-Interkonektif*.

[43] Louis Cohen, Lawrence Manion, and Keith Morrison, *Research Methods in Education*, 6th ed. (London & New York: Routledge, 2007), 404, https://doi.org/10.4324/9780203029053.

[44] Arielle S Selya et al., "A Practical Guide to Calculating Cohen's F2, a Measure of Local Effect Size, from PROC MIXED," *Frontiers in Psychology* 3 (2012): 111 (1-6), https://doi.org/10.3389/fpsyg.2012.00111.

this requirement. This study employed Partial Least Squares-Structural Equation Modeling (PLS-SEM) to evaluate the proposed model. The analysis proceeded in two stages: assessment of the measurement model and assessment of the structural model.[45] All analyses were conducted using SmartPLS version 3.

RESPONDENT DEMOGRAPHICS: ACCEPTANCE AND SUPPORT FOR THE UNIFIED GLOBAL HIJRI CALENDAR (KHGT)

The demographic characteristics of the respondents were categorized into four main indicators: gender, affiliation with Islamic mass organizations (*ormas*), academic program, and age. Data were gathered from 191 respondents using a questionnaire administered between May 13 and June 5, 2025. The demographic profile is summarized in Table 1. The results show that the majority of respondents were male (62.30%). In terms of organizational affiliation, most identified with Nahdlatul Ulama (NU) (76.96%). Regarding academic programs, a significant majority (88.48%) were enrolled in study programs under the Faculty of Sharia and Law, with additional participants from the Mathematics Department of the Faculty of Science and Technology. Age-wise, the largest groups were 21-year-olds (29.32%) and 22-year-olds (28.27%).

Table 1.0: Summary Profile of 191 Respondents

Indicators	Items	Frequency	(%)
Gender	Male	119	62.30%
	Female	72	37.70%

[45] Joseph F. Hair and Abdullah Alamer, "Partial Least Squares Structural Equation Modeling (PLS-SEM) in Second Language and Education Research: Guidelines Using an Applied Example," *Research Methods in Applied Linguistics* 1, no. 3 (2022): 100027, https://doi.org/10.1016/j.rmal.2022.100027. See also; Nasrul Fadhrullah Isa et al., "Factors Influencing Online Purchase Intention of Millennials and Gen Z Consumers," *Journal of Applied Structural Equation Modeling* 4, no. 2 (2020): 21–43, https://doi.org/10.47263/JASEM.4(2)03. See also; Baron and Kenny, "The Moderator–Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations."

Islamic Organization Affiliates	Nahdlatul Ulama (NU)	147	76.96%
	Muhammadiyah	26	13.61%
	Others (Not Specified)	18	9.42%
College Department	Islamic Family Law	88	46.07%
	Comparative Schools of Thought (*Madhhab*)	53	27.75%
	Sharia Economic Law	28	14.66%
	Mathematics	22	11.52%
Age	20	20	10.47%
	21	56	29.32%
	22	54	28.27%
	23	30	15.71%
	24	12	6.28%
	25	19	9.95%

Source: Data Analysis

The dominance of particular groups across these indicators may be attributed to several factors. The prevalence of male respondents and NU affiliation reflects the broader socio-cultural composition of the university's student population. Meanwhile, the concentration of specific academic programs and age groups is strongly influenced by the research criterion that respondents must have completed the *'ilm al-falak* course, which is offered only within four specific programs. This directly explains the concentration of respondents from the Faculty of Sharia and Law and from the 21–22 age group, which is typical for students taking that course.

PRE-HYPOTHESIS TEST: MEASUREMENT MODEL ASSESSMENT

The analysis of preliminary hypotheses and hypothesis testing was conducted using the partial least squares structural equation modeling (PLS-SEM) approach, employing SmartPLS version 3 (3.2.9) as the analytical tool. PLS-SEM was utilized in this study without conducting a normality test, as this method is intended to examine the model and construct relationships of each variable in an explanatory manner. [46] Preliminary hypothesis testing employed measurement models to assess validity and reliability. This assessment included the evaluation of convergent validity (outer loading), Cronbach's Alpha (CA), composite reliability (CR), average variance extracted (AVE), heterotrait-monotrait ratio (HTMT) to assess discriminant validity, and multicollinearity (outer and inner variance inflation factor [VIF]). [47] The results showed no indication of multicollinearity, as all VIF values were below the threshold of 5,[48] ranging from 1.24 to 3.08.

Table 2.0: Convergent Reliability and Validity

Construct	Item	Loading	CA	CR	AVE
Exogenous Variable: Knowledge of Islamic Astronomy					
Islamic Astronomy Knowledge Base (BPAI)			0.829	0.877	0.549
	X1.1	0.694			
	X1.2	0.820			
	X1.3	0.757			
	X1.4	0.542			

[46] Joseph F. Hair et al., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 3rd ed. (Los Angeles: SAGE Publications, Inc., 2022), 196. See also Isa et al., "Factors Influencing Online Purchase Intention of Millennials and Gen Z Consumers."

[47] Jörg Henseler, Christian M. Ringle, and Marko Sarstedt, "A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling," *Journal of the Academy of Marketing Science* 43, no. 1 (2015): 115–35, https://doi.org/10.1007/s11747-014-0403-8.

[48] Hair et al., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM),* 194.

	X1.5	0.869			
	X1.6	0.720			
Ḥisāb, *Ru'yah*, and Hilal Visibility (HRVH)			0.772	0.839	0.469
	X2.1	0.606			
	X2.2	0.778			
	X2.3	0.609			
	X2.4	0.741			
	X2.5	0.599			
	X2.6	0.749			
Use of the Hijri Calendar System (PSKH)			0.812	0.865	0.516
	X3.1	0.708			
	X3.2	0.734			
	X3.3	0.689			
	X3.4	0.742			
	X3.5	0.783			
	X3.6	0.648			
Mediator Variable: Science–Religion Integration (ISA)			0.886	0.914	0.641
	M1	0.642			
	M2	0.782			
	M3	0.799			
	M4	0.871			
	M5	0.858			
	M6	0.829			
Endogenous Variable: Unified Global Hijri Calendar (KHGT)					
Acceptance of KHGT (PKHGT)			0.850	0.888	0.572
	Y1.1	0.730			
	Y1.2	0.684			
	Y1.3	0.806			
	Y1.4	0.817			
	Y1.5	0.830			
	Y1.6	0.652			
Support for KHGT (DKHGT)			0.864	0.894	0.586

	Y2.1	0.737			
	Y2.2	0.818			
	Y2.3	0.759			
	Y2.4	0.763			
	Y2.5	0.698			
	Y2.6	0.813			

Source: SmartPLS Analysis

Convergent Validity (Loading)

Convergent validity analysis aims to confirm that each indicator accurately measures its intended latent variable. Convergent validity is considered adequate when each indicator has a factor loading greater than the recommended threshold of 0.50. For the exogenous variable knowledge of Islamic astronomy, three dimensions were measured. First, the Islamic Astronomy Knowledge Base (BPAI) had factor loadings ranging from 0.542 to 0.869, with five of the six indicators exceeding 0.70. Second, *Ḥisāb*, *Ru'yah*, and Hilal Visibility (HRVH) showed loadings between 0.599 and 0.778, all above 0.50, with three exceeding 0.70. Third, Use of the Hijri Calendar System (PSKH) demonstrated loadings from 0.648 to 0.783, with all indicators above 0.50 and four above 0.70. The mediator variable science–religion integration (ISA) also showed strong loadings between 0.642 and 0.871, with five indicators surpassing the ideal threshold of 0.70, suggesting consistent measurement of the construct.

For the endogenous variable response to KHGT, two dimensions were examined. For acceptance of KHGT (PKHGT), loadings ranged from 0.652 to 0.830, with four of the six exceeding 0.70. For support of KHGT (DKHGT), loadings ranged from 0.698 to 0.818.

Internal Consistency Reliability

Internal consistency reliability assesses the extent to which a set of items consistently represents the same construct. The two main metrics used are Cronbach's Alpha (CA) and Composite Reliability (CR) (Bhattacherjee, 2012). As shown in Table 2.0, the CA values for the knowledge of Islamic astronomy variable are: BPAI = 0.829; HRVH = 0.772; PSKH = 0.812. The ISA construct yielded a CA of

0.886. For KHGT responses, the CA values were 0.850 for PKHGT and 0.864 for DKHGT. All values exceed the minimum threshold of 0.70, indicating satisfactory internal consistency.[49]

CR is often preferred in PLS-SEM as it does not assume tau-equivalence like CA. A CR value ≥ 0.70 is considered acceptable. CR values for knowledge of Islamic astronomy were: BPAI = 0.877; HRVH = 0.839; PSKH = 0.865. The ISA construct showed a CR of 0.914. For KHGT responses, CR values were PKHGT = 0.888 and DKHGT = 0.894. These values, all well above 0.70, reinforce the instruments' internal consistency.[50]

Notably, CR consistently exceeds CA across constructs, suggesting the assumption of tau-equivalence is unmet. This further supports the use of CR for more accurate estimates and confirms that the constructs are congeneric—where indicators measure the same construct but with varying loadings.[51]

Average Variance Extracted **(AVE)**

The AVE values, as presented in Table 2.0, were: BPAI = 0.549; HRVH = 0.469; PSKH = 0.516; ISA = 0.641; PKHGT = 0.572; DKHGT = 0.586. Most constructs met the AVE threshold of ≥ 0.50, indicating adequate convergent validity. Specifically, BPAI, PSKH, ISA, PKHGT, and DKHGT exceeded this threshold. Although the AVE for HRVH (0.469) was slightly below 0.50, Fornell and Larcker (1981) assert that high CR can compensate for lower AVE. Given HRVH's CR of 0.839, its convergent validity remains acceptable. This indicates that although HRVH explains slightly less

[49] Guinea Utami and Danny Sanjaya Arfensia, "Adaptasi Binge-Watching Engagement Scale Questionnaire (BWESQ) Dalam Bahasa Indonesia," *Jurnal Penelitian dan Pengukuran Psikologi: JPPP* 13, no. 2 (2024): 94–110, https://doi.org/10.21009/JPPP.132.03.

[50] Dalila Dalila et al., "The Mediating Effect of Personal Values on the Relationships between Attitudes, Subjective Norms, Perceived Behavioral Control and Intention to Use," *Management Science Letters* 10, no. 1 (2020): 153–62, https://doi.org/10.5267/j.msl.2019.8.007.

[51] Joseph F. Hair et al., *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R*, Classroom Companion: Business (Cham: Springer International Publishing, 2021), 60, https://doi.org/10.1007/978-3-030-80519-7.

than 50% of its indicators' variance, its strong internal consistency confirms its measurement reliability.[52]

Discriminant Validity

The Heterotrait-Monotrait Ratio (HTMT) was used to evaluate discriminant validity, as it is considered superior to the Fornell–Larcker criterion. As shown in Table 3.0, all HTMT values fall below the 0.90 threshold, indicating discriminant validity was achieved.[53]

Table 3.0: Heterotrait-Monotrait Matrix (HTMT)

HTMT	1	2	3	4	5	6
BPAI (1)						
HRVH (2)	0.89					
PSHK (3)	0.90	0.88				
ISA (4)	0.85	0.88	0.89			
PKHGT (5)	0.48	0.54	0.65	0.62		
DKHGT (6)	0.50	0.48	0.61	0.59	0.89	

Source: SmartPLS Analysis

HTMT values between dimensions of knowledge of Islamic astronomy (BPAI, HRVH, PSKH) and the mediator variable ISA

[52] Claes Fornell and David F. Larcker, "Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics," *Journal of Marketing Research* 18, no. 3 (1981): 382–88, https://doi.org/10.1177/002224378101800313. See also Long W. Lam, "Impact of Competitiveness on Salespeople's Commitment and Performance," *Journal of Business Research* 65, no. 9 (2012): 1328–34, https://doi.org/10.1016/j.jbusres.2011.10.026.

[53] Henseler, Ringle, and Sarstedt, "A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling." See also Hair et al., "When to Use and How to Report the Results of PLS-SEM," 16. See also Ellen Roemer, Florian Schuberth, and Jörg Henseler, "HTMT2–an Improved Criterion for Assessing Discriminant Validity in Structural Equation Modeling," *Industrial Management & Data Systems* 121, no. 12 (2021): 2637–50, https://doi.org/10.1108/IMDS-02-2021-0082.

showed notable variations: HRVH–BPAI = 0.89; PSKH–BPAI = 0.90; PSKH–HRVH = 0.88. Similarly, HTMT values between ISA and BPAI, HRVH, and PSKH were 0.85, 0.88, and 0.89, respectively. These high HTMT values (0.88–0.90) suggest substantial empirical overlap between constructs of Islamic astronomy knowledge and science–religion integration, though they are conceptually distinct.[54]

In contrast, HTMT values between predictor constructs (Islamic astronomy and ISA) and outcome constructs (PKHGT and DKHGT) were significantly lower. For PKHGT, HTMT values with BPAI, HRVH, PSKH, and ISA were 0.48, 0.54, 0.65, and 0.62, respectively. For DKHGT, the corresponding values were 0.50, 0.48, 0.61, and 0.59. These values, all below the critical threshold, confirm strong discriminant validity between predictors/mediator and outcome constructs. However, the HTMT value between the two endogenous dimensions PKHGT and DKHGT was 0.89, nearing the 0.90 threshold. This indicates a high empirical correlation between acceptance and support for KHGT, suggesting that respondents may perceive these aspects as closely related.[55]

EVALUATION OF HYPOTHETICAL MODELS: STRUCTURAL MODEL ASSESSMENT

Mediation Analysis

Mediation analysis was conducted by following a systematic procedure to determine the presence and type of mediation effects. [56] Hypothesis testing was performed at a significance level of $\alpha = 0.05$. Based on the results presented in Tables 4.0 and 5.0, mediation effects were assessed for each hypothesized relationship. The results

[54] S. Mostafa Rasoolimanesh, "Discriminant Validity Assessment in PLS-SEM: A Comprehensive Composite-Based Approach," *Data Analysis Perspectives Journal* 3, no. 2 (2022): 1–8.
[55] Syed Hamad Hassan Shah et al., "How Consumer Perceived Ethicality Influence Repurchase Intentions and Word-of-Mouth? A Mediated Moderation Model," *Asian Journal of Business Ethics* 9 (2020): 1–21, https://doi.org/10.1007/s13520-019-00096-1.
[56] Hair et al., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM),* 240.

indicated that there were no mediation effects in the relationship between Islamic Astronomy Knowledge Base (BPAI) and the endogenous variables Acceptance of KHGT (PKHGT) and Support for KHGT (DKHGT). The indirect effects for the paths BPAI → ISA → PKHGT (p = 0.090) and BPAI → ISA → DKHGT (p = 0.105) were not statistically significant. Likewise, the direct effects from BPAI → PKHGT (p = 0.245) and BPAI → DKHGT (p = 0.833) were also not significant. According to the typology of mediation,[57] this condition is classified as no mediation with no effect. These findings suggest that possessing basic knowledge of Islamic astronomy does not inherently lead to acceptance or support for KHGT.

Table 4.0: Hypothesis Test

Hypothesis		**Path Coefficient**	***p*-value (α)**
Total Direct Effect			
H1	BPAI → PKHGT	-0.130	0.245
H2	BPAI → DKHGT	0.026	0.833
H3	HRVH → PKHGT	0.042	0.689
H4	HRVH → DKHGT	-0.032	0.793
H5	PSKH → PKHGT	0.208	0.036
H6	PSKH → DKHGT	0.213	0.133
Specific Indirect Effect			
H7	BPAI → ISA → PKHGT	0.068	0.090
H8	BPAI → ISA → DKHGT	0.070	0.105
H9	HRVH → ISA → PKHGT	0.135	0.001
H10	HRVH → ISA → DKHGT	0.139	0.003
H11	PSKH → ISA → PKHGT	0.144	0.009
H12	PSKH → ISA → DKHGT	0.149	0.004

Source: SmartPLS Analysis

[57] Hair et al., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM),* 240.

Table 5.0: Model Assessment

Hypothesis	Convidence Interval		*f* square	Decisions
	Min	Max		
Total Direct Effect				
H1	-0.327	0.091	0.008	Unsupported
H2	-0.188	0.165	0	Unsupported
H3	-0.153	0.178	0.001	Unsupported
H4	-0.256	0.146	0.001	Unsupported
H5	0.044	0.402	0.039	Supported
H6	-0.030	0.345	0.020	Unsupported
Specific Indirect Effect				
H7	-0.003	0.110	-	Unsupported
H8	-0.003	0.116	-	Unsupported
H9	0.046	0.160	-	Supported
H10	0.050	0.169	-	Supported
H11	0.050	0.182	-	Supported
H12	0.056	0.175	-	Supported

Source: SmartPLS Analysis

Robust evidence of mediation was found for other dimensions of Islamic Astronomy Awareness. In the relationship between HRVH and the two endogenous variables, full mediation was observed. The indirect effects of HRVH → PKHGT via ISA ($p = 0.001$) and HRVH → DKHGT via ISA ($p = 0.003$) were both statistically significant. Meanwhile, the direct effects of HRVH → PKHGT ($p = 0.689$) and HRVH → DKHGT ($p = 0.793$) were not significant. These findings indicate that the HRVH dimension does not directly drive positive responses toward KHGT. Rather, its influence is entirely mediated through the formation of beliefs in science–religion integration (ISA), which subsequently serves as the primary driver of KHGT acceptance and support. Thus, ISA functions as a crucial explanatory mechanism in this relationship.

A similar form of full mediation was identified in the relationship between PSKH and DKHGT. The indirect effect was significant ($p = 0.004$), while the direct effect was not ($p = 0.133$). This indicates that the PSKH dimension enhances support for KHGT, but the effect is entirely channeled through strengthened belief in science–religion integration.

In contrast, a *complementary partial mediation* was found in the relationship between PSKH and PKHGT. Both the indirect effect ($p = 0.009$) and the direct effect ($p = 0.036$) were significant and in the same positive direction. This suggests that the PSKH dimension exerts a dual influence: directly increasing openness to the idea of KHGT and indirectly reinforcing belief in science–religion integration, which in turn further increases acceptance. These two pathways complement each other, indicating that use of the Hijri calendar is a strong predictor of KHGT acceptance.

Model Fit

The coefficient of determination (R^2) for each endogenous dimension (PKHGT and DKHGT) indicates the proportion of variance explained by the predictors. Following Chin's (1998) guideline, R^2 values of 0.19, 0.33, and 0.67 correspond to weak, moderate, and substantial explanatory power, respectively. [58] In this study, the R^2 value for the mediator variable ISA was 0.67, indicating a high explanatory capacity. The R^2 values for PKHGT and DKHGT were both 0.33, suggesting moderate explanatory power still considered acceptable in mediation model contexts.

In addition, the predictive relevance of the model was evaluated using Q^2 values. A Q^2 value greater than 0 indicates predictive relevance, with values exceeding 0.25 categorized as moderate to high. [59] In the mediation model involving ISA, the

[58] Wynne W. Chin, "The Partial Least Squares Approach to Structural Equation Modeling," in *Modern Methods for Business Reaseacrh*, ed. George A. Marcoulides (Mahwah, New Jersey, London: Lawrence Erlbaum Associates Publishers, 1998), 295–336. See also Hair et al., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM),* 236.

[59] Hair et al., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 233.

inclusion of the mediator enhances the explanatory power for the endogenous variables. As explained by Henseler et al. (2016), R^2 reflects the variance explained by all exogenous constructs, and a relevant mediator should increase R^2 values. In this case, the positive Q^2 values for both endogenous dimensions indicate that ISA contributes not only to theoretical explanation but also to the model's predictive validity. In other words, the model demonstrates predictive validity with respect to the exogenous variables.[60]

The Standardized Root Mean Square Residual (SRMR) was used to assess overall model fit. An SRMR value close to 0 indicates a high degree of fit between predicted and observed data. Acceptable thresholds range from 0.08 to 0.10. In this model, the SRMR value was 0.10,[61] which falls within the acceptable tolerance for PLS-SEM. Taken together, the combination of moderate-to-high R^2 values, predictive Q^2, and acceptable SRMR suggests that the model is theoretically and practically sound and is capable of adequately explaining and predicting responses to KHGT.

Table 6.0: Model Fit

Compatibility	Value			Decisions
	SIA	PKHGT	DKHGT	
R2 (R Square)	0.67	0.33	0.33	Supported
Q2 (Q Square-Predict)	0.65	0.25	0.23	Supported
SRMR	0.10			Supported
PLS Predict	High	Medium	High	Supported

Source: SmartPLS Analysis

[60] Jörg Henseler, Geoffrey Hubona, and Pauline Ash Ray, "Using PLS Path Modeling in New Technology Research: Updated Guidelines," *Industrial Management & Data Systems* 116, no. 1 (2016): 2–20, https://doi.org/10.1108/IMDS-09-2015-0382.

[61] Li-tze Hu and Peter M. Bentler, "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives," *Structural Equation Modeling: A Multidisciplinary Journal* 6, no. 1 (1999): 1–55, https://doi.org/10.1080/10705519909540118.; Henseler, Hubona, and Ray, "Using PLS Path Modeling in New Technology Research: Updated Guidelines," 16.

PLS Predict

Evaluating the out-of-sample predictive power of a model is essential for validating its ability to forecast new observations, beyond in-sample explanatory strength. [62] The PLS Predict procedure, which applies k-fold cross-validation, serves as an assessment tool by comparing predicted values against actual values in a holdout sample. [63] Key metrics Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) (Table 7.0) indicate prediction accuracy, where lower values reflect greater precision. To assess predictive performance comprehensively, results from PLS-SEM are compared to a linear model (LM) that regresses endogenous indicators on exogenous indicators without considering path structure.[64]

Table 7.0: Model Validation and Prediction Summary

Indicator (Item)	PLS-SEM		LM	
	RMSE	MAE	RMSE	MAE
SIA (M1)	0.466	0.329	0.504	0.365
SIA (M2)	0.347	0.269	0.378	0.293
SIA (M3)	0.377	0.259	0.402	0.282
SIA (M4)	0.363	0.261	0.387	0.275
SIA (M5)	0.382	0.278	0.411	0.294
SIA (M6)	0.341	0.25	0.370	0.265
PKHGT (Y1.1)	0.599	0.488	0.620	0.493
PKHGT (Y1.2)	0.658	0.525	1.006	0.554
PKHGT (Y1.3)	0.511	0.411	0.547	0.429

[62] Marko Sarstedt and Nicholas P. Danks, "Prediction in HRM Research–A Gap between Rhetoric and Reality," *Human Resource Management Journal* 32, no. 2 (2022): 485–513, https://doi.org/10.1111/1748-8583.12400.

[63] Galit Shmueli et al., "Predictive Model Assessment in PLS-SEM: Guidelines for Using PLSpredict," *European Journal of Marketing* 53, no. 11 (2019): 2322–47, https://doi.org/10.1108/EJM-02-2019-0189.

[64] Sarstedt and Danks, "Prediction in HRM Research–A Gap between Rhetoric and Reality," 497.

PKHGT (Y1.4)	0.527	0.438	0.546	0.442
PKHGT (Y1.5)	0.470	0.377	0.479	0.368
PKHGT (Y1.6)	0.452	0.384	0	0.395
DKHGT (Y2.1)	0.626	0.506	0.650	0.521
DKHGT (Y2.2)	0.522	0.421	0.574	0.449
DKHGT (Y2.3)	0.596	0.480	0.607	0.488
DKHGT (Y2.4)	0.554	0.461	0.592	0.475
DKHGT (Y2.5)	0.491	0.394	0.499	0.379
DKHGT (Y2.6)	0.476	0.364	0.500	0.368

Source: SmartPLS Analysis

All six indicators of the SIA construct showed lower RMSE values under PLS-SEM compared to the LM. This consistent advantage supported by 100% of indicators demonstrates high predictive power and confirms that conceptualizing science–religion integration within a PLS-SEM framework offers substantial predictive leverage. [65] The PKHGT dimension showed more variation in predictive strength. PLS-SEM produced lower RMSE values than the LM in five out of six indicators (83.3%). This majority suggests moderate predictive power [66] for PKHGT, although the predictive strength is not uniform across indicators.[67] Similar to SIA, the DKHGT dimension exhibited high predictive power. PLS-SEM consistently yielded lower RMSE values across

[65] Galit Shmueli and Otto R Koppius, "Predictive Analytics in Information Systems Research," *MIS Quarterly* 35, no. 3 (2011): 553–72.; Hair and Alamer, "Partial Least Squares Structural Equation Modeling (PLS-SEM) in Second Language and Education Research: Guidelines Using an Applied Example."

[66] Sarstedt and Danks, "Prediction in HRM Research–A Gap between Rhetoric and Reality," 498.

[67] Shmueli et al., "Predictive Model Assessment in PLS-SEM: Guidelines for Using PLSpredict," 500.

all six indicators, reaffirming this dimension (Y2) as having strong predictive capacity and validating the utility of PLS-SEM in accurately forecasting support for KHGT.[68]

Overall, PLS Predict analysis reveals variation in out-of-sample predictive power across the three constructs. These findings underscore the importance of routine predictive evaluation in PLS-SEM, as recommended by scholars.[69] The differing predictive capacities of each construct highlight that while PLS-SEM's path modeling is generally robust, its effectiveness in predicting new data depends on the nature of the endogenous constructs. Such insights are critical for refining models and advancing theoretical development. Prediction-oriented evaluations like this make a meaningful contribution to the rigor and practical utility of PLS-SEM research across disciplines.[70]

Model Robustness: Linearity Test and Importance–Performance Map Analysis (IPMA)

To ensure the model is free from specification errors, particularly related to non-linearity and omitted variables, Ramsey's Regression Equation Specification Error Test (RESET) was employed.[71] This test was applied to both regression models in this study. As summarized in Table 8.0, the results indicate no specification errors, based on the comparison of p-values against a significance level of $\alpha = 0.05$.

[68] Shmueli et al., "Predictive Model Assessment in PLS-SEM: Guidelines for Using PLSpredict," 499.
[69] Shmueli et al., "Predictive Model Assessment in PLS-SEM: Guidelines for Using PLSpredict," 498.
[70] Hair et al., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM),* 43.
[71] J. B. Ramsey, "Tests for Specification Errors in Classical Linear Least-Squares Regression Analysis," *Journal of the Royal Statistical Society Series B: Statistical Methodology* 31, no. 2 (1969): 350–71, https://doi.org/10.1111/j.2517-6161.1969.tb00796.x.

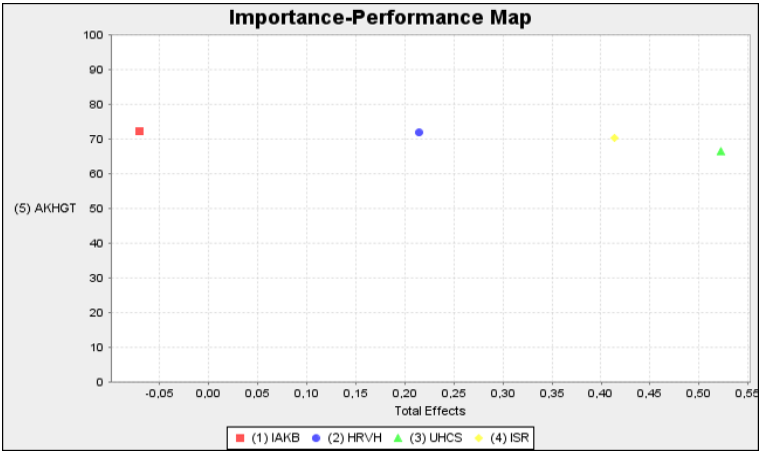
Table 8.0: Ramsey RESET Linearity Test

Model	F- statistic	Prob > F (*p*-value)	Decisions (α = 0.05)
PKHGT	1.63	0.184	Linear
DKHGT	1.90	0.130	Linear

Source: Data Analysis

The p-values for both models (0.184 and 0.130) are greater than α = 0.05, confirming that both regression models are correctly specified and satisfy the linearity assumption. Ramsey (1969) recommended RESET as a method for detecting functional form misspecification by incorporating polynomial terms of fitted values to identify significant non-linearity. [72] Wooldridge (2025) also noted that significance of squared or cubic fitted values would indicate that the original linear model is inadequate and should be revised. [73] Hence, the non-significant p-values in this study affirm that no strong evidence of functional misspecification or omitted variable bias was found.

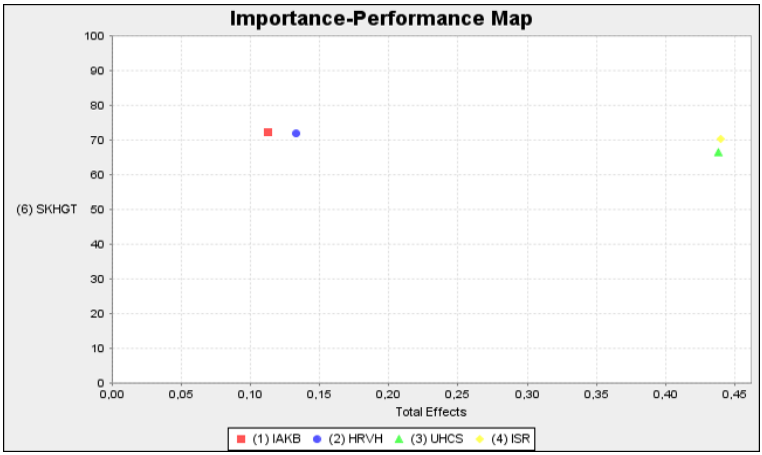
Figure 2.0: IPMA on Acceptance of KHGT (SmartPLS)



[72] Ramsey, "Tests for Specification Errors in Classical Linear Least-Squares Regression Analysis," 369.

[73] Jeffrey M Wooldridge, *Introductory Econometrics: A Modern Approach*, 8th ed. (Boston, MA: Cengage Learning, 2025), 211.

Figure 3.0: IPMA on Support for KHGT (SmartPLS)



The IPMA revealed differences in strategic intervention priorities across the four main dimensions BPAI, HRVH, PSKH, and ISA on the two outcome variables, PKHGT and DKHGT. The data show that PSKH had the highest total effect on both outcomes (0.522 for PKHGT and 0.438 for DKHGT) but demonstrated the lowest performance (66.5) among the dimensions. This is consistent with IPMA logic, which emphasizes that high-importance but low-performance dimensions represent top priorities for strategic intervention.[74]

The ISA construct also had high importance (0.413 for PKHGT and 0.439 for DKHGT) and moderate performance (70.3), indicating the need for modest improvements. This could involve reinforcing synergistic narratives between science and religion through cross-disciplinary models or collaborations between scholars and scientists. Such strategies aim to integrate religious and

[74] Joseph F. Hair et al., *Advanced Issues in Partial Least Squares Structural Equation Modeling*, 2nd ed. (Thousand Oaks, CA: SAGE Publications, Inc., 2023), 2010. See also Christian M. Ringle and Marko Sarstedt, "Gain More Insight from Your PLS-SEM Results," *Industrial Management & Data Systems* 116, no. 9 (2016): 1865–86, https://doi.org/10.1108/IMDS-10-2015-0449.

empirical values in implementing social innovations that enhance public acceptance and support.

HRVH and BPAI occupy positions that warrant critical evaluation. HRVH had moderate importance (0.214 for PKHGT and 0.133 for DKHGT) with relatively high performance (71.9), suggesting that sustained technical interventions may help maintain its influence. Conversely, BPAI had the highest performance (72.3) but exerted a negative effect on PKHGT (–0.070) and a weak effect on DKHGT (0.113). This implies that the basic astronomy knowledge content may need to be restructured to be more applicable and less counterproductive in increasing responsiveness to KHGT.

SYNTHESIS OF SCIENCE AND RELIGION: FROM KHGT RESPONSES TO EMPIRICAL *FIQH*

This study provides robust empirical validation of the theoretical proposition that the adoption of complex socio-religious innovations, such as KHGT, is catalyzed by an integrative epistemological framework rather than by technical knowledge alone.[75] These findings offer a way out of the stagnation of classical *fiqh* discourse, which, as Laabdi (2024) classifies, is often trapped in theoretical *ikhtilaf* revolving around textual debates without practical solutions.[76] By operationalizing M. Amin Abdullah's paradigm, this study successfully demonstrates quantitatively how the dialogue among the three pillars of civilization, textual authority, empirical rationality, and the ethical framework, collectively shapes the KHGT's response.[77] This is concretely evident in the decision of the *Pimpinan Pusat Muhammadiyah* (2025), which synthesizes Quranic arguments from Surah Al-Baqarah verse 189 (universality) and Surah Yunus verse 5 (*ḥisāb*) with technical parameters of 5°–8° and the

[75] M. Amin Abdullah, "Religion, Science, and Culture: An Integrated, Interconnected Paradigm of Science," *Al-Jami'ah: Journal of Islamic Studies* 52, no. 1 (2015): 175.

[76] Mourad Laabdi, "Ilm al-ikhtilāf in Modern Western and Muslim Studies of Juristic Disagreement–A Critical Analysis," *Journal of College of Sharia and Islamic Studies* 42, no. 2 (2024), 187.

[77] Nisa A.-Zahro Jauzaa' dan Rustam Ibrahim, "Scientific Integration of Perspectives M. Amin Abdullah (Integrative-Interconnective Approach)," *Al-Afkar: Journal for Islamic Studies* 8, no. 1 (2025): 298–306.

principle of global *maṭlaʿ* as a philosophical solution to the historical debate.[78]

The most significant finding from this empirical data is the full mediation role of the Science-Religion Integration (ISA) construct. Hypothesis testing indicates that the direct effects of astronomical knowledge (particularly the HRVH and PSKH dimensions) on the endogenous variables are largely insignificant. However, these effects become statistically highly significant ($p < 0.05$ for H9, H10, H11, H12) when mediated by ISA.

Juridically, these statistical findings serve as a crucial *taḥqīq al-manāṭ* (legal context verification) for addressing the debate regarding lunar determination methods. First, there is a deconstruction of the meanings of '*ummi'* and '*ru'yah*,' where resistance to KHGT tends to stem from a literal interpretation of the hadith '*faqdurūlah'* (direct observation) and the concept of '*ummi'* (the absence of technology), which is perceived as prohibiting *ḥisāb*.[79] However, full mediation by ISA demonstrates that this resistance collapses when respondents adopt an integrative paradigm. This indicates that the concept of *ru'yah* has shifted from naked-eye observation to digital imaging.[80] In other words, the acceptance of KHGT by younger respondents is not a rejection of sharia, but rather an epistemological acknowledgment that the definition of *ru'yah* has expanded to include precise global astronomical calculations.

Second, there is technical knowledge inertia. Without the internalization of these integrative values, technical-astronomical

[78] Pimpinan Pusat Muhammadiyah, *Keputusan Pimpinan Pusat Muhammadiyah Nomor 86/KEP/I.0/B/2025 tentang Tanfidz Pengembangan Pedoman Hisab Muhammadiyah tentang Kalender Hijriah Global Tunggal* (Yogyakarta: Pimpinan Pusat Muhammadiyah, 2025).
[79] Muhamad Syazwan Faid et al., "Methods in Determining New Hijri Month: A Thematic Review from Islamic Jurisprudence Perspective," *Malaysian Journal of Syariah and Law* 13, no. 1 (2025): 80.
[80] Muhammad Rasywan Syarif et al., "The Transformation of Rukyah al-Hilal: Integrating Digital Imaging Technology in Islamic Moon Sighting Practices," *Malaysian Journal of Syariah and Law* 13, no. 1 (2025): 319.

understanding proves to be inert and lacks sufficient momentum to change attitudes (acceptance) and behavior (support).[81]

The strength of this relationship is underscored by the coefficient of determination (R^2) for ISA, which reaches 0.67, indicating that two-thirds of the variance in respondents' tendency to adopt an integrative perspective is explained by their exposure to astronomical insights. This confirms that technical and scientific knowledge is an essential foundation for building an integrative paradigm.[82] On the other hand, the moderate R^2 value (0.33) for the endogenous variables quantitatively validates the argument that other external factors, such as socio-political challenges and the dynamics of institutional authority, also play a crucial role.[83] This finding revitalizes Hasbi Ash-Shiddieqy's concept of a global *maṭla'*; Hasbi argues that geographical differences should no longer be a barrier to unity in the modern era.[84] The research data sociologically validates this perspective. The sharia legitimacy of the KHGT now depends on the community's readiness to embrace a global legal jurisdiction (*wilāyat al-ḥukm*).[85]

The integration paradigm, as manifested in the research methodology, yields intersubjective validation that transcends mere academic discourse. This modeling process serves as a formal validation arena for interdisciplinary dialogue among the

[81] Waston, "Pemikiran Epistemologi Amin Abdullah dan Relevansinya Bagi Pendidikan Tinggi di Indonesia," *Profetika: Jurnal Studi Islam* 17, no. 1 (2016): 88, https://doi.org/10.23917/profetika.v17i01.2102.

[82] Sufratman, "Integrasi Agama dan Sains Modern Di Universitas Islam Negeri (Studi Analisis Pemikiran M. Amin Abdullah)," *Al-Afkar* 5, no. 1 (2022): 210–28.

[83] Holis, Ahmad Musadad, and Tri Pujiati, "The Role of Public Law in Determining the Islamic Calendar in Indonesia," *Al-Hilal: Journal of Islamic Astronomy* 7, no. 1 (2025): 15.

[84] Marwadi, Heriyanti, and Izza, "The Fiqh of Hisab-Ru'ya in the Twentieth Century Indonesia: Study on the Thoughts of Hamka, Hasbi Ash-Shiddieqy, and Moenawar Chalil about the Unification of Hijri Calendar," 24.

[85] Pimpinan Pusat Muhammadiyah, *Keputusan Pimpinan Pusat Muhammadiyah Nomor 86/KEP/I.0/B/2025 tentang Tanfidz Pengembangan Pedoman Hisab Muhammadiyah tentang Kalender Hijriah Global Tunggal* (Yogyakarta: Pimpinan Pusat Muhammadiyah, 2025).

perspectives of astronomy (modern science), science-religion integration (epistemology), and the KHGT's response (social discourse). The statistical significance of the relationships among these variables demonstrates that diverse disciplines can interact coherently within an open scientific framework.[86] Drawing on the historiography of Islamic science,[87] these findings affirm the principle of priority (*fiqh al-awlawiyyat*), establishing that the preservation of the unity of the ummah (the objective of KHGT) holds a *ḍarūrī* (primary) status over the maintenance of partial local methods. Therefore, strengthening the science-religion integration paradigm represents an empirical *fiqh* concept that serves as a prerequisite for efforts toward Islamic calendar unification, prioritizing unity as the primary objective based on normative evidence supported by currently available statistically representative data.

CONCLUSION

This study aimed to address the central question of how students at UIN Sunan Kalijaga Yogyakarta respond to the concept of the Unified Global Hijri Calendar (KHGT). Based on the data analysis, several key conclusions were drawn that directly answer the sub-questions posed in this research.

First, the influence of Islamic astronomy awareness on KHGT responses is complex and indirect. Quantitative findings indicate that astronomy awareness, as an exogenous variable, does not automatically lead to positive responses toward KHGT. Its influence varies across dimensions: technical understanding (HRVH) and practical experience using the calendar (PSKH) emerged as more influential predictors compared to basic astronomical knowledge (BPAI), which even showed a negative effect on some aspects.

Second, science–religion integration (ISA) was found to function as a crucial epistemological bridge. The mediating role of

[86] Abdullah, "Religion, Science, and Culture: An Integrated, Interconnected Paradigm of Science," 199.
[87] Niri et al., "Astronomy Development since Antiquity to Islamic Civilization from the Perspective of Islamic Historiography," 173.

ISA is a central finding of this study. The data strongly suggest that Islamic astronomy awareness can only be transformed into strong acceptance and support for KHGT when mediated by a cognitive framework that integrates science and religion. ISA functions as a form of hadharah al-falsafah, providing the ethical and philosophical foundation that bridges the empirical meanings of astronomy with the higher objective of Muslim unity, which is the core spirit of KHGT. In other words, students' responses are shaped not only by what they know about astronomy but more significantly by how they frame that knowledge in relation to their beliefs.

Implications of the Findings

Theoretically, this study contributes to several fields. First, it strengthens the study of science–religion integration by offering empirical validation of M. Amin Abdullah's epistemological model, showing that the integrative paradigm is a measurable construct and is relevant in shaping social attitudes. Second, in the sociology of knowledge, the study demonstrates that knowledge (in this case, Islamic astronomy) does not operate in a vacuum but is negotiated and accepted through the interpretive frameworks (ISA) held by individuals and communities. Third, in the field of Islamic astronomy itself, the study encourages a shift in focus from purely technical-methodological debates to a broader understanding of the socio-epistemological factors that influence the acceptance of innovation within society.

In practical terms, these findings provide an evidence-based strategic foundation, with the results of the Importance-Performance Map Analysis (IPMA) highlighting that the most effective interventions lie in strengthening the constructs of Science-Religion Integration (ISA) and the Utilization of the Hijri Calendar System (PSKH). Therefore, educational strategies must shift from merely teaching the technical aspects of crescent visibility to constructing an explicit narrative about the synergy of science as a tool to reinforce Sharia values. At the same time, advocacy efforts should prioritize the unity of the Muslim community as a shared platform that transcends methodological differences. This practical strategy reflects the demand for a shift in the ijtihad approach from mere 'dalil-based *fiqh'* toward 'paradigm-based *fiqh'* or 'empirical *fiqh*,' in which the validity of applying global principles proven empirically necessitates an integrative worldview within society.

Thus, the sharia legitimacy of KHGT in Indonesia must be built upon an educational foundation that no longer pits the authority of science against that of revelation, making the community's readiness for this paradigm a form of *taḥqīq al-manāṭ* that is inseparable from the application of the law itself.

Limitations and Future Research

The primary limitation of this study lies in the generalizability of its findings. The sample was predominantly composed of respondents affiliated with a single socio-religious organization, which limits the applicability of results to the broader population of Muslim students in Indonesia, who represent diverse backgrounds. Additionally, the negative effects observed in the BPAI construct suggest underlying complexities that are not yet fully explained by the current model.

Based on these limitations, future research should be directed toward three areas. First, replication of this study using a stratified sampling design that better represents the heterogeneity of the target population would help test the model's robustness. Second, qualitative follow-up studies such as in-depth interviews or case studies are needed to explore why basic astronomical knowledge correlates weakly with KHGT acceptance. Third, future research should consider expanding the model by incorporating theoretically relevant variables to gain a more comprehensive understanding of the dynamics behind KHGT responses in broader societal contexts.

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