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A Comparative Study of Science Unification Models at Universitas Muhammadiyah Yogyakarta (UMY) and Universitas Ahmad Dahlan (UAD)

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Abstract

This research aims to examine the comparative analysis of science unification models implemented at Universitas Muhammadiyah Yogyakarta (UMY) and Universitas Ahmad Dahlan (UAD). The findings reveal that both institutions employ distinct approaches in integrating knowledge. UMY implements an Islamic Worldview-based model as its cosmological framework, which integrates Islamic intellectual traditions from the past with modern scientific disciplines. Meanwhile, UAD develops an integration-interconnection model based on Syamsul Anwar's hierarchical normative assumption paradigm. In its integration and interconnection approach, UAD establishes an Islamic worldview cosmology that encompasses tawhid (monotheism), UAD's three ethos, Al-Islam and Kemuhammadiyahan values, and Muhammadiyah's Progressive Islamic principles. Despite their different approaches, both models contribute significantly to addressing the science dichotomy and developing modern Islamic scientific paradigms in Indonesia.

Keywords: *Unification Models, Islamic Higher Education, Science Integration, Muhammadiyah Universities, Islamic Worldview*

Introduction

The discourse on knowledge integration in Indonesian Islamic higher education has been ongoing for several decades.[1] This emerged as a response to the

[1] M Amin Abdullah, *Islamic Studies Di Perguruan Tinggi: Pendekatan Integratif-Interkonektif* (Pustaka Pelajar, 2006), 92–93.

dichotomy between religious and general sciences that remains deeply rooted in the Islamic education system.[2] This phenomenon occurs not only in State Islamic Higher Education Institutions (PTKIN) but also in Muhammadiyah Higher Education Institutions (PTM), which from the beginning have developed modern Islamic education integrating religion with life.[3]

In a historical context, the dichotomy of knowledge is a colonial legacy that separated religious education from general education.[4] The colonial education system introduced educational dualism: secular schools teaching secular sciences and pesantren focusing on religious sciences.[5] The impact is still felt today, where there remains a perspective that separates "general" sciences from "religious" sciences, as if they have no connection to each other.

Since its inception, Muhammadiyah has demonstrated significant concern regarding this matter. KH Ahmad Dahlan, the founder of Muhammadiyah, pioneered the integration of modern education with Islamic education.[6] He established educational institutions that simultaneously taught religious and secular sciences, a revolutionary breakthrough during his era.[7] This foundational spirit has subsequently been perpetuated by Muhammadiyah's higher education institutions in a more systematic and structured manner.[8]

Universitas Muhammadiyah Yogyakarta (UMY) and Universitas Ahmad Dahlan (UAD), as two prominent Muhammadiyah higher education institutions in Yogyakarta, have developed distinctive models of scientific integration. UMY has developed an integration model based on Islamic Worldview that emphasizes the unity of Islamic worldview as the foundation for scientific development. This model endeavors to integrate classical Islamic intellectual traditions with the advancement of modern

[2] Mulyadhi Kartanegara, "Integrasi Ilmu Sebuah Rekonstruksi Holistik," 2005, 15–20.

[3] Abdul Munir Mulkhan, *Warisan Intelektual KH Ahmad Dahlan Dan Amal Muhammadiyah* (Percetakan Persatuan, 1990), 45.

[4] Karel A Steenbrink, *Pesantren Madrasah Sekolah: Pendidikan Islam Dalam Kurun Modern, Terj. Karel A. Steenbrink Dan Abdurrahman* (Jakarta: Darma Aksara Perkasa, 1994), 6–7, http://lib.ui.ac.id/file?file=pdf/metadata-2767.pdf.

[5] Azyumardi Azra, *Pendidikan Islam: Tradisi Dan Modernisasi Menuju Milenium Baru* (Logos Wacana Ilmu, 1999), 95–97.

[6] Ahmad Najib Burhani, *Muhammadiyah Jawa* (Suara Muhammadiyah, 2016), 78–79.

[7] Arifin MT, "Gagasan Pembaharuan Muhammadiyah Dalam Pendidikan," 1987, 132–33.

[8] Syarifuddin Jurdi, "Muhammadiyah Dalam Dinamika Politik Indonesia 1966-2006," 2011, 156.

sciences. Meanwhile, UAD has developed a scientific unification model based on integration-interconnection with a hierarchical normative assumption paradigm.

These two models are compelling subjects for analysis due to several reasons. First, they represent serious endeavors by Muhammadiyah higher education institutions in addressing scientific dichotomy. Second, each model possesses distinctive characteristics that reflect different interpretations of Muhammadiyah's scientific integration spirit. Third, the implementation of both models can provide valuable insights for the development of Islamic scientific paradigms in Indonesia.

Studies on the scientific integration models in Islamic higher education institutions have been extensively conducted with diverse approaches and research focuses.[9] Several previous studies have concentrated on integration models in State Islamic Universities (PTKIN), such as UIN Sunan Kalijaga with its "integration-interconnection" model,[10] UIN Maulana Malik Ibrahim with its "knowledge tree" concept,[11] and UIN Sunan Gunung Djati with its "revelation guiding science" paradigm.[12] However, comparative studies on scientific integration models within Muhammadiyah higher education institutions remain limited, particularly those specifically comparing implementations between two Muhammadiyah universities.

The urgency of this research becomes increasingly relevant considering the challenges faced by Islamic higher education institutions in the contemporary era.[13] Globalization and rapid technological advancement necessitate appropriate responses in the development of Islamic sciences.[14] Furthermore, the growing awareness of the

[9] Zainal Abidin Bagir, *Integrasi Ilmu Dan Agama: Interpretasi Dan Aksi* (Mizan Pustaka, 2005), 31–32.

[10] M Amin Abdullah, "Multidisiplin, Interdisiplin, & Transdisiplin: Metode Studi Agama & Studi Islam Di Era Kontemporer," *Yogyakarta: IB Pustaka*, 2020, 184–85.

[11] Imam Suprayogo, "Paradigma Pengembangan Keilmuan Islam Perspektif UIN Malang," 2006, 57.

[12] Nanat Fatah Natsir, "Implementasi Paradigma Wahyu Memandu Ilmu Pada Pembidangan Ilmu-Ilmu Keislaman," 2008, 23.

[13] Azhar Arsyad, "Buah Cemara Integrasi Dan Interkoneksitas Sains Dan Ilmu Agama," *Hunafa: Jurnal Studia Islamika* 8, no. 1 (2011): 2.

[14] Ziauddin Sardar and Ehsan Masood, "The Future of Muslim Civilisation, Terj. Rahmani Astuti," *Rekayasa Masa Depan Islam*, 1989, 95.

significance of spiritual values in scientific development drives the need for more comprehensive integration models.[15]

This research aims to conduct an in-depth and systematic comparative analysis of the scientific unification models developed by UMY and UAD. Specifically, this study seeks to address two primary research questions: (1) What are the philosophical foundations underlying the scientific integration model of UMY and the scientific unification model of UAD? (2) What are the structural frameworks of UMY's integration model and UAD's unification model, and what are their respective contributions and implications for the development of modern Islamic scientific paradigms in Indonesia?

The significance of this research can be observed from multiple aspects. First, it serves as an academic documentation of Muhammadiyah higher education institutions' efforts in developing distinctive scientific integration models. Second, this study contributes to the enrichment of discourse concerning the Islamization of knowledge in Indonesia.

Research Method

This research employs a qualitative approach with a comparative method. The analytical framework utilizes George Bereday's comparative analysis model, which consists of four systematic stages. The first stage, Description, encompasses data collection on UMY's scientific integration model and UAD's scientific unification model, along with formal documentation of both models. The second stage, Interpretation, involves analyzing the historical context of model development, examining the philosophical foundations of each model, and evaluating their implementation. In the third stage, Juxtaposition, the research focuses on aligning the characteristics between both models, identifying similarities and differences, and categorizing comparative aspects. The fourth stage, Comparison, involves conducting an in-depth comparative analysis, evaluating the strengths and limitations of each model, and synthesizing the findings.

[15] Osman Bakar, Yuliani Liputo, and MS Nasrulloh, *Tauhid & Sains: Perspektif Islam Tentang Agama & Sains* (Pustaka Hidayah, 2008), 76.

Data collection is conducted through documentation study, in-depth interviews with model developers from both institutions, and observation of model implementation. Data analysis is performed using a descriptive-comparative approach, employing Al-Attas's Theory of Islamization of Knowledge as the theoretical framework to understand the philosophical basis and implementation of both scientific unification models.

Scientific Integration Model at UMY

1. Basic Concept of UMY's Islamic Worldview

a. Quranic and Hadith Foundation

The integrative paradigm in Islamic scholarship has strong foundations from the Quran and Sunnah, which can be understood through the istiqraʾ maʿnawī (thematic inductive) approach. *First*, this is reflected in how the Quran gives a central position to the concept of knowledge, which is mentioned up to 750 times in its various forms. One of the verses demonstrating this is:

قُلْ هَلْ يَسْتَوِي الَّذِينَ يَعْلَمُونَ وَالَّذِينَ لَا يَعْلَمُونَ ۗ إِنَّمَا يَتَذَكَّرُ أُولُو الْأَلْبَابِ

"Say, 'Are those who know equal to those who do not know?' Only those who possess intellect will take heed." (QS. Al-Zumar: 9)

Second, the Quran invites humans to observe the signs of Allah's power, as mentioned in the verse:

سَنُرِيهِمْ آيَاتِنَا فِي الْآفَاقِ وَفِي أَنفُسِهِمْ حَتَّىٰ يَتَبَيَّنَ لَهُمْ أَنَّهُ الْحَقُّ ۗ أَوَلَمْ يَكْفِ بِرَبِّكَ أَنَّهُ عَلَىٰ كُلِّ شَيْءٍ شَهِيدٌ

"We will show them Our signs in the horizons and within themselves until it becomes clear to them that it is the truth. Is it not sufficient concerning your Lord that He is, over all things, a Witness?" (QS. Fussilat: 53)

Third, Islam emphasizes the importance of cooperation and mutual support in goodness, as mentioned in the verse:

وَتَعَاوَنُوا عَلَى الْبِرِّ وَالتَّقْوَىٰ وَلَا تَعَاوَنُوا عَلَى الْإِثْمِ وَالْعُدْوَانِ

"*And cooperate in righteousness and piety, but do not cooperate in sin and aggression*." (QS. Al-Maidah: 2)

Fourth, this integrative paradigm is reinforced by the hadith of Prophet Muhammad SAW which states:

خَيْرُ النَّاسِ أَنْفَعُهُمْ لِلنَّاسِ

"*The best of people are those who are most beneficial to others*." (HR. Ahmad, Thabrani, Daruqutni)

These four foundations demonstrate that Islam teaches a holistic and integrative approach in viewing knowledge. Islam not only encourages the development of religious sciences but also other sciences that can benefit humanity. This paradigm emphasizes that all knowledge essentially originates from Allah SWT and must be used for the benefit of humanity.[16]

b. Definition of Integration

The concept of integration possesses profound etymological roots, derived from the Latin word "integrare," meaning to make whole or complete.[17] In contemporary academic discourse, integration encompasses a systematic process of amalgamation that culminates in the formation of a coherent and unified entity. The English term "integration" is synonymous with synthesis,[18] conceptually denoting the act of combining disparate ideas or elements to construct novel configurations.

When employed as a verb, "to integrate" carries an operational significance, referring to the process of unifying or amalgamating various components into a functionally optimized whole. Allen F. Repko identifies three fundamental aspects inherent to the concept of integration: holism, unity, and synthesis.

The integration paradigm emerges from the epistemological understanding that diverse disciplines of knowledge are inherently interconnected and interdependent. Integration serves as a theoretical and

[16] Muhammad Rofiq Muzakkir, "Naskah Akademik Paradigma dan Pedoman Implementasi Integrasi Ilmu Universitas Muhammadiyah Yogyakarta," 2023, 17–21.

[17] Allen F Repko, Rick Szostak, and Michelle Phillips Buchberger, *Introduction to Interdisciplinary Studies* (Sage Publications, 2019), 376.

[18] Ineta Helmane and Ilze Briška, "What Is Developing Integrated or Interdisciplinary or Multidisciplinary or Transdisciplinary Education in School?," *Signum Temporis* 9, no. 1 (2017): 7–15.

methodological bridge facilitating harmonious communication across various disciplines. While some scholars differentiate between integration (the fusion of distinct disciplines) and interconnection (the mere juxtaposition or linking of two knowledge domains), for pragmatic purposes, the term integration can encompass both processes.

Furthermore, the concept of integration extends to the collective endeavors of scholars from disparate fields collaborating to address common research problems. In academic terminology, this is recognized as interdisciplinarity, representing the convergence of multiple perspectives in approaching and resolving shared challenges. This collaborative framework enables a more comprehensive understanding of complex phenomena through the synthesis of diverse methodological and theoretical approaches.[19]

c. Dimensions of Integration

The dimensions of scientific integration can be delineated into three interrelated fundamental aspects. First, the epistemic dimension (sources of knowledge) acknowledges and simultaneously utilizes various validated sources of knowledge within Islamic epistemology, encompassing fitrah (primordial nature), nash (divine revelation), rational cognition, cosmos, human-historical experiences, and divine inspiration (ilham). The integrative paradigm validates all these sources and maintains their potential for simultaneous operationalization.

Second, the methodological dimension encompasses multiple perspectives. Al-Ghazali categorizes these into three approaches: the scriptural approach (naqli/deductive) founded on the Quran and Sunnah, the rational approach (aqli/inductive) based on logical reasoning, and the convergence of both methodologies. Meanwhile, the Manhaj Tarjih Muhammadiyah, citing Abid Aljabiri, recognizes three distinct epistemological frameworks: Bayani (scripture-based epistemology), Burhani (empirical-

[19] Muzakkir, "Naskah Akademik Paradigma dan Pedoman Implementasi Integrasi Ilmu Universitas Muhammadiyah Yogyakarta," 21–23.

philosophical based epistemology), and Irfani (intuitive-based epistemology). The integrative paradigm acknowledges that while each discipline possesses distinct characteristics and scope, they can be synthesized to provide a holistic understanding.

Third, the theoretical dimension implements theoretical frameworks from one discipline to analyze research objects from another discipline. This cross-disciplinary application manifests in various forms, such as employing sociological theories to examine Islamic education, or conversely, utilizing Islamic perspectives to analyze contemporary issues like AI's impact on spiritualism or examining international conflicts through Ibn Khaldun's theory of 'asabiyyah. This approach facilitates productive interdisciplinary dialogue while maintaining the distinctive characteristics of each discipline.

d. Objetives of Integration

The integration of knowledge encompasses five substantial objectives:

1) To cultivate prophetic Muslim intellectuals who demonstrate not only academic excellence but also embody faith (iman), God-consciousness (taqwa), and noble character (akhlaq). This emphasizes the intrinsic relationship between knowledge, faith, and character development.
2) To produce Muslim polymaths capable of mastering multiple disciplines (generalists) while simultaneously maintaining specialized expertise in specific fields. This dual competency model reflects the classical Islamic scholarly tradition while addressing contemporary professional demands.
3) To advance theoretical knowledge through the development of novel perspectives and the potential emergence of new disciplines through interdisciplinary synthesis. This objective facilitates epistemological innovation and intellectual cross-pollination.
4) To catalyze scientific innovation within Islamic educational institutions, thereby contributing to scientific discoveries beneficial to humanity. This goal emphasizes the practical application of integrated knowledge in advancing human civilization.

5) To provide pragmatic solutions to contemporary challenges, including environmental degradation, climate change, social issues, economic disparities, and various modern challenges. This objective underscores the practical utility of integrated knowledge in addressing real-world problems.

It is crucial to note that integration itself is not the ultimate objective (the end in and of itself) but rather serves as an intellectual instrument or methodological procedure for achieving these noble aims. This instrumental perspective emphasizes integration's role as a means rather than an end, focusing on its utility in achieving broader educational and societal objectives.[20]

2. Implementation Policy

The integration of knowledge in higher education context needs to be implemented comprehensively within the three domains of *"tri dharma perguruan tinggi"*. This implementation can be conducted through several complementary strategic approaches. To realize effective integration, a deep understanding of various models that can be applied in the learning process is required.

In the teaching aspect, integration can be implemented through two main models. The first model integrates Islamic values into existing courses, while the second model adds specialized courses that provide an Islamic framework. Both models have their respective advantages and can be applied according to the context and needs of the study program. However, the implementation of these models needs to be supported by more specific approaches, especially in the context of integration with the main sources of Islamic teachings.

In relation to this, integration with the Quran and Sunnah can be realized through three main patterns. First, the development of Quran and Sunnah-based ethics courses adapted to each study program's scientific field. Second, the teaching of instrumental knowledge to understand the Quran and Sunnah relevant to specific disciplines. Third, direct integration of relevant verses and

[20] Muzakkir, 27–29.

hadith into lecture materials, which can be done individually by course instructors. Besides integration with these primary sources, attention also needs to be given to classical Islamic intellectual heritage.

In a broader context, integration with turāst (classical intellectual heritage) offers deeper dimensions in the learning process. This can be done through five complementary patterns: establishing it as independent courses, using it as a theoretical framework for research, making it the material object of study, combining it with field studies, and conducting comparisons with modern sciences. This comprehensive approach requires institutional policy support such as Arabic language training for lecturers and encouragement of turāst-based research.

Complementing the above aspects, integration with modern sciences and social humanities becomes an important component in creating a holistic scientific framework. Implementation can be carried out by two main implementing groups: lecturers with science and social humanities backgrounds who expand their scope of study, and academics from Islamic studies who integrate modern scientific perspectives in their studies. The synergy between these two groups can be realized through course development with contemporary approaches in Islamic studies and the study of Islamic law using modern social theories.

To ensure the sustainability and effectiveness of this integration program, a series of systematic supporting policies is needed. Starting from faculty competency development to organizing academic forums that encourage interdisciplinary dialogue. With this comprehensive and structured approach, it is hoped that substantive and sustainable scientific integration can be created in the higher education context. The success of this implementation will ultimately contribute to the development of a more integrative and responsive scientific paradigm to the needs of the times.

3. Structure and Model Components

The implementation of knowledge integration at UMY recognizes two main stages: holistic (ideal) integration and partial integration. UMY's integration

methodology is inclusive, accommodating both forms while considering the knowledge background, capabilities, and tendencies of integration implementers. It is important to note that integration not only has an epistemic dimension but also a da'wah dimension that is embracing rather than judging personal efforts. In the implementation context, there are three main forms:

a. Holistic Integration, represents the ideal form where interaction occurs between three knowledge entities simultaneously: The Quran and As-Sunnah, contemporary science and social humanities knowledge, and Islamic intellectual tradition (turāst). All scientific activities are conducted within the framework of an Islamic worldview. For example, a lecturer will integrate guidance from the Quran/As-Sunnah, dialogue with Islamic civilization history, and modern scientific production in their teaching. In this holistic form, both modern social sciences humanities and pre-modern Islamic heritage (turāst) are dialogued and synthesized coherently to achieve comprehensive understanding.
b. Partial Integration Type 1, a form of integration that only involves dialogue between one discipline with the Quran and As-Sunnah, without involving modern knowledge from other disciplines and Islamic intellectual tradition (turāst). Although acceptable as an initial stage, this form needs improvement. This phenomenon is often found among those who have limited access to turāst or who adopt a monodisciplinary approach. This can also occur due to disproportionate paradigms regarding past intellectual heritage, such as considering classical intellectual tradition irrelevant or even burdensome.
c. Partial Integration Type 2, a form of integration that only occurs between the Quran/As-Sunnah and Islamic intellectual tradition, without involving modern knowledge. This tendency is often found in groups with limited access to or antipathy towards modern knowledge. This phenomenon remains an empirical reality at present, but still requires improvement and transformation through dialogue with modern science and social humanities.[21]

[21] Muzakkir, 37–43.

UMY's inclusive integration methodology provides space for various forms of implementation while continuing to encourage development towards more holistic forms. This approach reflects the understanding that integration is a gradual process that considers the diversity of capacities and backgrounds of its implementers. Each stage in this integration process will be described in more detail, including various possible patterns of implementation in subsequent sections.

It is important to emphasize that UMY's integration methodology provides recognition and appreciation for every integration effort, whether still partial or having reached the holistic stage. This aligns with the da'wah dimension of integration that is embracing and guiding, rather than sorting or judging personal efforts of integration subjects.

UAD's Science Unification Model

In forming the grand concept of science unification, UAD adopts the normative leveling theory developed by Syamsul Anwar, which is structured in three hierarchical levels: Basic Values (Al-Qiyam Al-Asasiyyah), General Principles (Al-Ushul Al-Kulliyyah), and Practical Guidelines (Al-Ahkam Al-Far'iyyah).

1. Basic Values of UAD Science Unification (*Al-Qiyam Al-Asasiyyah*)

a. Tauhid Value

The appreciation of tauhid serves as the fundamental basis of scientific ethics at Universitas Ahmad Dahlan (UAD), integrating theological dimensions and universal humanity. This concept encompasses not only theological-specific aspects but also includes the philosophical framework (al-ru'yah al-falsafiyah) and fundamental values (al-qiyam al-asasiyah) of Islam in understanding universal humanity. Conceptually, tauhid as UAD's scientific ethical basis is developed through the rahāmutiyah tauhid paradigm based on Q.S. Al-An'am [6]:12, which emphasizes the value of gentleness (riqqah) and concrete benevolence (iḥsān).

The distinctive characteristic of this concept lies in the integration of faith, knowledge, and action in a unified whole. There is a paradigm

transformation from mere mystical belief towards suprarational understanding oriented towards creating ḥayāh ṭayyibah (good life). The emphasis on raḥmah (compassion) in scientific activities becomes a distinctive feature that distinguishes it from other science unification concepts.

In the academic context, the implementation of this concept is realized through teaching, research, and community service activities that are consistently grounded in transcendental values. The development of Islamic values-based scientific temper becomes a priority, manifested through the implementation of scientific activities with a dedicated, professional, and innovative ethos. All these academic activities not only pursue scientific achievement but also consider spiritual and social dimensions.

The expected impact of implementing this concept is comprehensive, encompassing individual and social benefits, as well as providing enlightenment for community life. Furthermore, this concept is expected to contribute to the development of humanistic science and technology and the advancement of Islamic civilization. Thus, UAD's science unification, characterized by rahāmutiyah tauhid transcendence, successfully integrates spiritual-intellectual dimensions in scientific activities to realize universal benefit.[22]

b. Multi-faceted Monism: Ontology

Multi-faceted monism serves as the ontological foundation of UAD's science unification, acknowledging the unity of reality (wahdah al-wujud) through three sequential manifestations converging on a singular truth. The first manifestation is the regularity of the universe, which represents Allah's predestination through natural laws (sunnatullāh). The second manifestation takes form in human creativity in understanding and utilizing this natural regularity based on sunnatullāh and divine values (the

[22] Lembaga Pengembangan dan Studi Islam and Universitas Ahmad Dahlan, "Naskah Akademik Buku Pedoman Unifikasi Ilmu (Tauhid Al-'Ulum) Pengembangan Ilmu Berbasis Al-Islam dan Kemuhammadiyahan (AIK) Universitas Ahmad Dahlan (UAD)" (UAD Press bekerjasama dengan LPSI UAD, 2024), 19–22.

wisdom of God). Meanwhile, the third manifestation is the manifestation of Allah's names and attributes (the wisdom of Allah) itself.

This paradigm becomes a philosophical basis that distinctively differentiates UAD's science unification from Western perspectives which only acknowledge a single truth in the form of the universe. UAD integrates two parallel knowledge systems: āyat qauliyah (written revelation) and āyat kauniyah (universal revelation). The essence of UAD's education fundamentally represents an effort to cultivate awareness about the unity of reality extracted from both systems through continuously renewed human creativity. In this concept, natural truth (predestination), human truth (creativity), and divine truth (revelation) merge into a complete and inseparable ontological unity.[23]

c. Metaphysical Realism: Epistemology

Metaphysical realism serves as an epistemological approach that acknowledges two sources of knowledge: empirical and metaphysical realities. This approach forms the epistemological foundation of UAD's science unification with the following main characteristics:

Metaphysical realism recognizes the regularity of the universe as Allah's creation, which can be understood through the integration of three epistemological approaches:

1) Bayani: Derived from revelation (Al-Qur'an and Sunnah), employing deductive methods with naqliyah reasoning to comprehend texts.
2) Irfani: Sourced from human spiritual experiences, utilizing abductive methods that combine naqliyah-aqliyah reasoning to achieve divine wisdom.
3) Burhani: Based on natural regularity, implementing inductive methods with aqliyah reasoning through empirical-rational verification.

The ultimate objective of this epistemology extends beyond merely discovering empirical truth (the truth) to achieving truth that aligns with Allah's mercy and pleasure (the right). This approach enables UAD to

[23] Lembaga Pengembangan dan Studi Islam and Universitas Ahmad Dahlan, 12–14.

integrate religious and general sciences within a comprehensive unification framework, where all scientific activities are directed towards knowing Allah through qauliyah and kauniyah verses as a form of worship.[24]

d. Teo-Humanistik: Aksiologi Theo-Humanistic: Axiology

The axiology of UAD's science unification is grounded in the theo-humanistic concept that integrates two value sources:

1) Deontological Ethics: Values that evolve within human cultural processes (such as Pancasila)
2) Ontological Ethics: Divine values derived from religious teachings (Al-Islam and Kemuhammadiyahan)

The main characteristics of UAD's theo-humanistic axiology are:

1) Integration of empirical truth with divine values (the highest wisdom of Allah)
2) Positioning scientific activities as worship to know Allah (ma'rifatullah)
3) Directing scientific development towards human welfare (amar ma'rūf nahi munkar)
4) Aiming to achieve holistic happiness: material-spiritual (well-being) and social (well-ness) for worldly and afterlife benefits

Thus, theo-humanistic axiology serves as an ethical foundation ensuring that scientific development at UAD is oriented not only towards empirical truth but also towards universal divine and human values.[25]

2. General Principles of UAD Science Unification (Al-Ushul Al-Kulliyyah)

a. UAD's Ethos of Service

The Ethos of Service, as UAD's fundamental value, serves as the primary foundation in implementing all activities within the university's quadruple mandate (caturdarma), encompassing research, teaching, community service, and Al-Islam Kemuhammadiyahan (AIK). This value derives its essence from Q.S. Adz-Dzariyat [51]:56, which affirms that all human activities fundamentally constitute forms of worship to Allah SWT.

[24] Lembaga Pengembangan dan Studi Islam and Universitas Ahmad Dahlan, 14–17.
[25] Lembaga Pengembangan dan Studi Islam and Universitas Ahmad Dahlan, 17–19.

In its implementation, UAD's service ethos is constructed through three primary characteristics. First, the innovative character (imtiyāz) emphasizes critical and creative attitudes in generating novelty, with the ultimate objective of achieving excellence in the dimensions of faith, worship, and morality. Second, the professional character (itqān) is reflected through disciplined, responsible, and productive attitudes, accompanied by humility and modesty grounded in the hadith concerning the significance of professionalism in work.

The third characteristic is dedicative (iḥsān), which manifests in four principal attitudes. Sincerity serves as the primary foundation, viewing every task as a form of worship. Honesty functions as the key to greater virtue. Consistency (istikamah) materializes in maintaining quality, while care is directed toward scientific development, human welfare, and environmental preservation.

These three characteristics do not exist in isolation but are integrated into the implementation of the university's quadruple mandate. Their orientation is clear: to produce works and activities that not only hold worship value but also provide universal benefits for society and the environment at large.[26]

b. Prerequisites for Science Unification

The prerequisites for science unification encompass five fundamental interrelated aspects. First, reciprocity emphasizes inter-disciplinary collaboration without forcing unification, wherein each discipline mutually respects and utilizes their respective advantages. Second, equality (non-alienation) perceives all sciences as equal and originating from Allah SWT, rejecting scientific hierarchies that may precipitate alienation.

Third, intersubjective verifiability acknowledges that neither pure objectivity nor subjectivity exists in science; rather, intelligent dialogue between both is necessary through scientific community participation.

[26] Lembaga Pengembangan dan Studi Islam and Universitas Ahmad Dahlan, 22–25.

Fourth, creative imagination promotes the synthesis of different ideas to generate fresh perspectives. Fifth, positive impact demands tangible scientific contributions to human welfare, encompassing social relevance, inclusivity, sustainability, and adherence to ethical and moral principles.

These five prerequisites constitute a comprehensive framework for realizing meaningful and beneficial science unification for civilization. The framework ensures that the integration of knowledge remains purposeful while maintaining its ethical and spiritual dimensions, ultimately contributing to the advancement of human civilization through a holistic approach to scientific development.[27]

c. Functional Relationships in Science Unification

The functional relationships in science unification manifest in eight complementary forms:

1) Justificative: Fields provide mutual justification and legitimacy between disciplines.
2) Informative: Mutual provision of data and facts to enrich understanding.
3) Confirmative: Cross-validation of findings and teachings between scientific fields.
4) Comparative: Comparison of concepts across disciplines to broaden understanding.
5) Complementary: Mutual supplementation to produce more robust analysis.
6) Contributive: Findings in one field facilitate new discoveries in others.
7) Corrective: Mutual correction of inaccurate interpretations or conceptions.
8) Verificative: Cross-validation of findings or statements between fields.

[27] Lembaga Pengembangan dan Studi Islam and Universitas Ahmad Dahlan, 29–31.

It is essential to understand that in practice, science unification need not fulfill all eight functions simultaneously. A science unification practice can be considered successful if it satisfies at least one of the eight functions above. However, the more functions fulfilled, the richer and deeper the inter-disciplinary dialogue becomes. In other words, these eight functions maintain flexibility and may manifest either individually or simultaneously within a science unification study.

3. Practical Guidelines for Science Unification at UAD (Al-Ahkam Al-Far'iyyah)

a. Models of Science Unification

All science unification models at UAD are founded upon Al-Islam and Muhammadiyah (AIK) values with a basis in tawhid appreciation, driven by Innovative-Professional-Dedicative (IPD) service ethos, and directed towards the service of Progressive Islamic Message (RIB).

1) Intradisciplinary Model, Strengthening and deepening within a specific scientific discipline. For instance, UAD's Faculty of Medicine developing halal vaccines. The research team not only focuses on medical-pharmacological aspects but also ensures materials and processes comply with sharia. This research demonstrates how a single discipline can be strengthened by integrating Islamic values, producing professional innovations while maintaining halal and tayyib aspects.
2) Cross-disciplinary Model, Understanding one field through another field's perspective. For example, UAD's digital da'wah program employing communication psychology approaches. Preachers are equipped with understanding of digital audience psychology to optimize da'wah message delivery. This program illustrates how psychology can enrich Islamic da'wah methods, creating more effective and relevant approaches for modern society.
3) Multidisciplinary Model, Multiple disciplines working together while maintaining their individual characteristics. As exemplified by UAD's sharia-based waste bank program involving various fields. Environmental Engineering handles waste processing, Islamic

Economics manages sharia-based financial systems, Communication Studies manages socialization, and Islamic Studies ensures program alignment with Islamic principles. Each field contributes according to its expertise toward common goals.

4) Interdisciplinary Model, Deep interaction between disciplines producing new perspectives. For instance, UAD's Islamic fintech development combining Information Technology, Islamic Economics, and Islamic Law. This collaboration produces digital zakat applications that don't merely transfer traditional concepts to digital platforms but create new systems integrating technological convenience with sharia compliance.
5) Transdisciplinary Model, Creation of frameworks transcending disciplinary boundaries. As illustrated by UAD's "Smart Islamic City" project integrating smart technology, sustainable urban planning, Islamic values, social welfare, and environmental conservation. This framework not only combines various disciplines but creates a new paradigm of urban development that can be universally applied while remaining aligned with Islamic values.[28]

These five models maintain flexibility and can be implemented according to needs, either independently or in combination, while adhering to AIK values foundation, IPD ethos, and RIB service objectives.

b. Impact: Service (Progressive Islamic Message)

All UAD's movements are grounded in deep tawhid appreciation, carried out with IPD (Innovative-Professional-Dedicative) ethos, and awareness of humanity's dual role as 'abdun (devotion) and khalīfah (service). Based on these principles, UAD manifests its service through five interconnected and integrated dimensions, encompassing vertical (divine) to horizontal (humanity and universe) aspects. These five dimensions are:

1) Islamic Community (Ummah), Community development through Islamic brotherhood (ukhuwah Islamiyah) to realize a community that excels in both teachings and reality.

[28] Lembaga Pengembangan dan Studi Islam and Universitas Ahmad Dahlan, 34–44.

2) Nationality (NKRI), Contributing to the Republic of Indonesia through the concept of Dār al-'Ahdi wa asy-Syahādah in politics, economics, law, and culture.
3) Humanity, Service focusing on internal elevation of scholars' status, while providing cross-cultural, religious, and national services with compassionate spirit externally.
4) Universality (Global), Building world civilization with balance between science-technology and spiritual-moral values.
5) Scientific (Future), Development of new disciplines and theories, accompanied by technology utilization for welfare, and sustainable development of knowledge treasury.[29]

Ultimate Goal: Realizing ḥayāh ṭayyibah (good life) through integration of science and Islamic values.

B. Contextual Interpretation of Science Unification Model

1. Historical Background

The science integration model at UMY has strong roots in Muhammadiyah organizational decisions, particularly through the 46th Muhammadiyah Congress Resolution in Yogyakarta, which emphasized the necessity of educational revitalization. Muhammadiyah's educational perspective emphasizes the mastery of Science and Technology based on textual revelation (qauliyah) and natural revelation (kauniyah), making the establishment of scientific integration guidelines in Muhammadiyah Higher Education institutions an urgent necessity. Subsequently, through the 48th Muhammadiyah Congress Resolution in Solo regarding Progressive Islamic Message, this concept was further strengthened.

The initiation of CISIC at UMY is inseparable from the role of Dr. Rofiq Muzakkir, a UMY lecturer who had recently completed his doctoral studies at Arizona State University in Religious Studies with a dissertation titled "Tradition and Modernity in Ulama Discourse on Power Seizure". With his expertise in knowledge decolonization and scientific integration, Rofiq successfully convinced the BPH to establish CISIC (Center For Integrative

[29] Lembaga Pengembangan dan Studi Islam and Universitas Ahmad Dahlan, 25–27.

Science and Islamic Civilization), which was later formalized through Rector's Decree No. 1070/S/KEP-UMY/1X/2022 on September 13, 2022. CISIC was established as a think tank institution tasked with developing roadmaps for the development and integration of knowledge, science, and technology based on Islamic values.

Meanwhile, Universitas Ahmad Dahlan (UAD) developed its unification model based on the vision of becoming an excellent and innovative university serving the nation and humanity, imbued with Islamic values. UAD adopted the hierarchical norm theory developed by Syamsul Anwar, which consists of three hierarchical levels: Basic Values (Al-Qiyam A-Asasiyyah), General Principles (Al-Ushul Al-Kulliyyah), and Practical Guidelines (Al-Ahkam Al-Far'iyyah). Although UAD does not have a single central figure with specific expertise in this field, the development of the science unification model at UAD involved several academics who were students of Rofiq Muzakkir, such as Qaem Aulassyahied, Niki Alma F., and 'Aabidah Ummu 'Aziizah, who became part of the core team in forming UAD's science unification.

Both models of science integration and unification were developed in complementary socio-academic contexts. From a social perspective, the development of these models responds to society's need for integrative education capable of addressing contemporary challenges. From an academic perspective, both UMY and UAD use Islamic values as the foundation for scientific development, albeit with different institutional approaches. UMY develops its science unification model through CISIC, specifically formed as a think tank institution, while at UAD, the implementation of science unification is carried out through the rector's program entrusted to the Islamic Studies Development Institute (LPSI) as the institution responsible for managing and developing Al-Islam and Muhammadiyah Studies (AIK) on campus.

The development of science unification models at both institutions reflects serious efforts to integrate Islamic values with modern scientific development while addressing the dichotomy between religious and general sciences that has long been problematic in Islamic education.

2. Philosophical Foundation

In observing the development of scientific integration models in Muhammadiyah higher education institutions, there are notable similarities in thought patterns with several contemporary Islamic studies scholars. The science unification model developed by UAD shows strong resonance with the thinking of Wael B. Hallaq. This is reflected in the conceptual structure built by UAD through the hierarchical norm theory, which integrates Al-Qiyam Al-Asasiyyah (Basic Values), Al-Ushul Al-Kulliyyah (General Principles), and Al-Ahkam Al-Far'iyyah (Practical Guidelines). This hierarchical approach aligns with Hallaq's emphasis on the importance of systematic structure in building Islamic knowledge. Furthermore, the use of epistemology that integrates Bayani, Irfani, and Burhani approaches in UAD's model also reflects a deep attention to classical Islamic epistemological tradition, a characteristic that is prominent in Hallaq's works.

Meanwhile, the integration model developed by UMY demonstrates interesting alignment with Nidhal Guessoum's thinking. The main characteristics of UMY's model, which opens space for dialogue between modern science, Islamic intellectual tradition (turāst), and the Quran/Sunnah, as well as its acceptance of partial forms of integration, reflect a more flexible and inclusive approach. This attitude closely resembles Guessoum's view, which advocates harmonious dialogue between modern science and Islam without forcing total Islamization. The flexibility of UMY's model, which recognizes and values the stages of integration from partial to holistic, shows similarity with Guessoum's approach that emphasizes the importance of building bridges between Islamic tradition and modern thought in a gradual and dialogical manner.

Nevertheless, it is important to note that these similarities are more conceptual and methodological in nature, not meaning that both institutions explicitly adopt the thoughts of these figures. Both UAD and UMY have developed their own unique and contextual models while maintaining elements that align with the thoughts of these contemporary Islamic studies scholars.

C. Juxtaposition of Science Unification Models

In this section, we will present the distinctive frameworks of UMY's science integration concept and UAD's science unification through the following infographic:

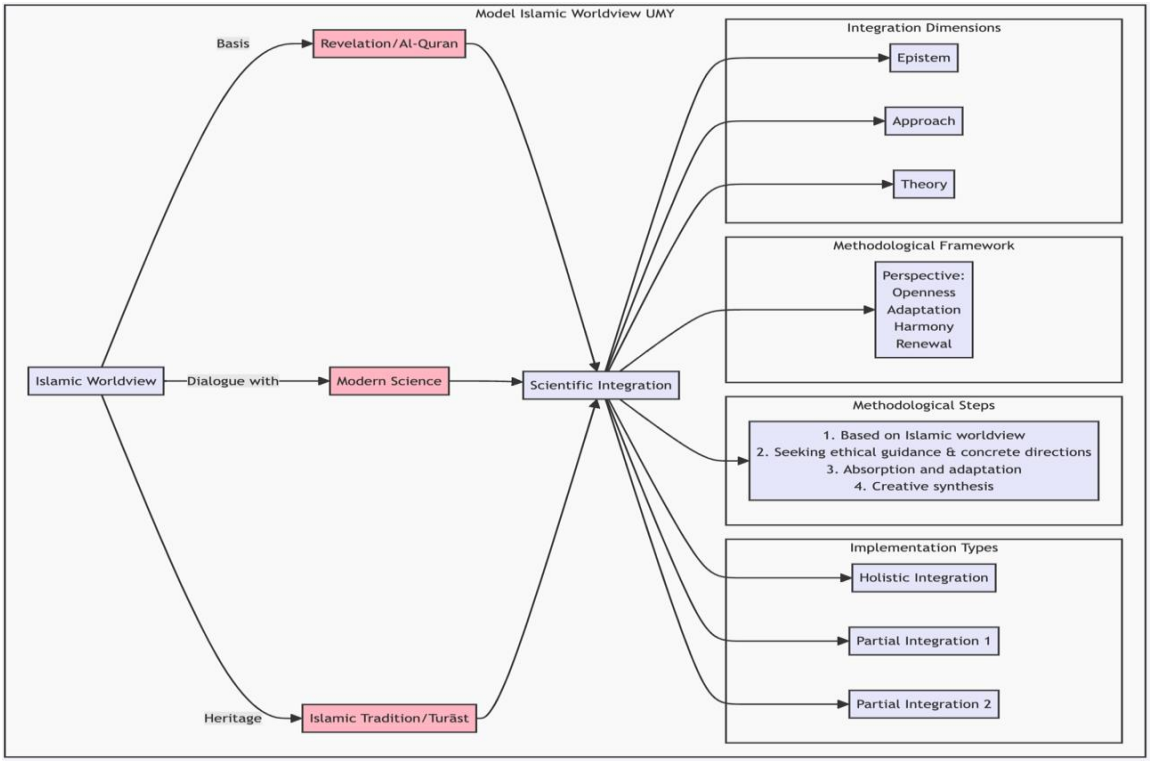

Figure: Model isllamic worldview UMY

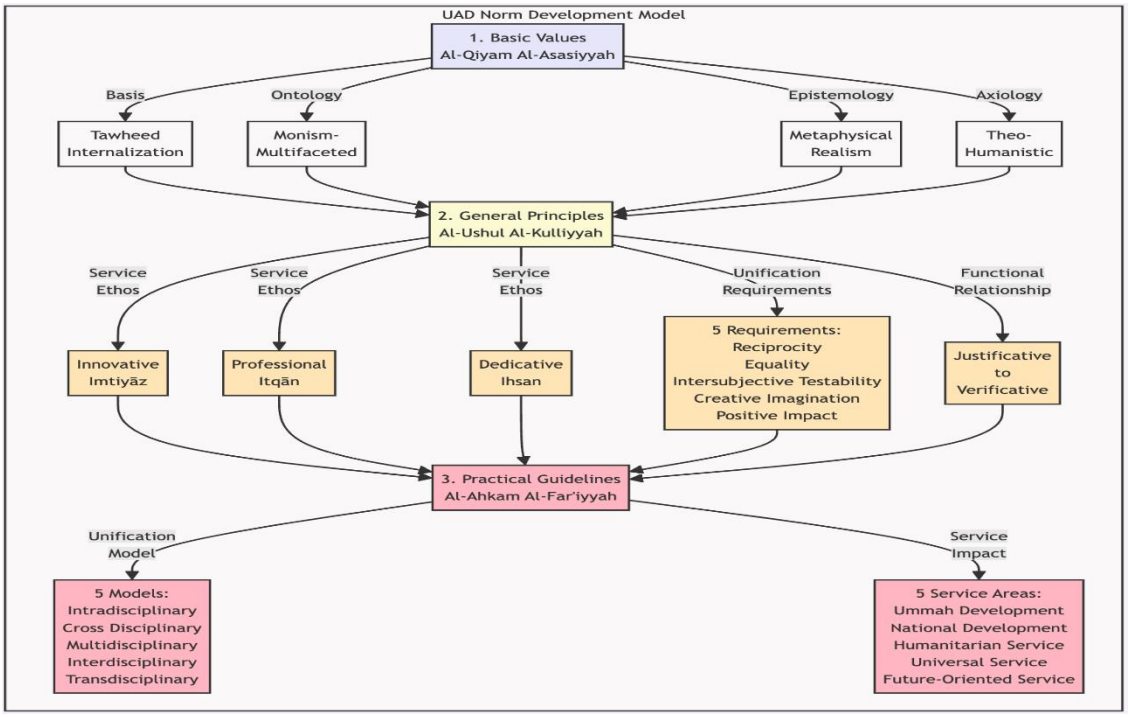

Figure: UAD norm development model

D. Comparative Analysis

In developing models of scientific integration in Islamic higher education institutions, Universitas Muhammadiyah Yogyakarta (UMY) and Universitas Ahmad Dahlan (UAD) have developed distinctive and unique approaches. A comparative analysis of these two models provides deep insights into different approaches to integrating Islamic values with modern sciences.

1. Model Strengths and Limitations

The UMY scientific integration model demonstrates significant strength in its conceptual simplicity. With three main pillars comprising Revelation, Modern Science, and Islamic Tradition, this model offers an easily comprehensible and flexible approach in its implementation. Its primary advantage lies in the dialogical approach that enables dynamic interaction between components, creating a harmonious balance among various sources of knowledge. This model does not place one source above others but rather

acknowledges the authority and contribution of each field in scientific development.

Conversely, the UAD model exhibits strength in its comprehensive systematic structure. With a clear hierarchy ranging from basic values (Al-Qiyam Al-Asasiyyah) to practical guidelines (Al-Ahkam Al-Far'iyyah), this model provides a measurable operational framework. Its philosophical depth is reflected in strong ontological, epistemological, and axiological foundations, seamlessly integrated with Islamic values. The UAD model also excels in providing detailed practical guidelines, including five unification models and measurable service impacts.

However, both models have areas requiring development. The UMY model, despite its flexibility, needs strengthening in methodological aspects and more detailed operational guidelines. Meanwhile, the UAD model, with its complexity, sometimes poses challenges in practical implementation and requires simplification to facilitate operational-level application.

2. Synthesis and Implications

The contribution of both models to Islamic scientific development is highly significant. The UMY model strengthens dialogue between various knowledge sources, while the UAD model provides a comprehensive philosophical framework. In terms of scientific methodology, UMY promotes a dialogical integrative approach, whereas UAD provides a systematic methodological structure.

The practical implications of these models are evident in various aspects of Islamic higher education. In curriculum development, both models encourage the integration of Islamic values into courses and the development of integrative learning methods. In research and publication, these models promote interdisciplinary research and cross-disciplinary collaboration. In community service, both emphasize the implementation of Islamic values and the development of community needs-based programs.

For future development, several recommendations can be proposed. In the short term, focus should be given to faculty training and practical implementation guide development. The medium term can be directed toward

developing evaluation systems and strengthening integrative research networks. Meanwhile, long-term priorities include developing centers for scientific integration studies and international collaboration.

Interestingly, the synthesis of these two models can produce a more comprehensive approach. By incorporating UMY's dialogical strengths and UAD's systematic structure, a hybrid model can be developed that is more adaptive and responsive to contemporary Islamic higher education needs. This synthetic model needs to be reinforced with continuous evaluation and development systems to ensure its effectiveness and relevance.

Ultimately, both UMY and UAD models have made valuable contributions to the development of Islamic higher education in Indonesia. The uniqueness and strengths of each model can complement each other, paving the way for developing more mature and comprehensive scientific integration models in the future. The challenge ahead lies in optimizing the strengths of both models while continuing to make improvements to address the dynamics and needs of the times.

Conclusion

The philosophical foundations of scientific integration models at UMY (Universitas Muhammadiyah Yogyakarta) and UAD (Universitas Ahmad Dahlan) demonstrate distinctive methodological approaches. UMY has developed a model based on Islamic Worldview with a dialogical approach that emphasizes the equilibrium between three primary sources: Divine Revelation, Modern Science, and Islamic Tradition (turāst). This model exhibits flexibility by acknowledging various forms of integration, both partial and holistic. Meanwhile, UAD has adopted a more systematic normative hierarchy theory comprising three levels: Al-Qiyam Al-Asasiyyah, Al-Ushul Al-Kulliyyah, and Al-Ahkam Al-Far'iyyah. The UAD model is constructed upon the foundation of tawhid rahāmutiyah, employing three epistemological approaches (Bayani, Irfani, Burhani), while implementing the concept of monism-multifaceted in ontology and theo-humanistic in axiology.

Regarding form and implementation, both models possess complementary characteristics and contributions. UMY has developed three forms of integration (one

holistic and two partial types) that strengthen the dialogue between various knowledge sources, thereby promoting the development of more inclusive and adaptive scholarship. Conversely, UAD implements five more structured unification models (ranging from intradisciplinary to transdisciplinary), providing a systematic philosophical and methodological framework, and producing measurable practical guidelines. These models have significant implications for the development of modern Islamic scientific paradigms in Indonesia, particularly in integrated curriculum development, interdisciplinary research, and community service. Furthermore, the unique characteristics of each model create opportunities for developing a hybrid model that can optimize both strengths while contributing to efforts to overcome the dichotomy between religious and general sciences in Indonesian Islamic education.

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