QUANTUM INTEGRATION MODEL FOR RELIGION AND SCIENCE

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Abstract

The integration of religion and science has not been fully developed. Several models of integrating religion and science seem to contain fundamental weaknesses. This article aims to discuss an alternative integration called quantum integration. This research is a literature review using content analysis based on primary sources. The research results show that quantum integration consists of three structures: the principle of the unity of religion and science, an open attitude between scientists and religious leaders, and theistic values. This integration structure encapsulates three fundamental principles and three philosophical constructs. The three fundamental principles in question are the principle of non-contradictory between religion and science, equality, and mutual need. The three philosophical constructs consist of an un-materialistic worldview, a unified source of knowledge, openness, and theistic values. Based on its principles, philosophical construction, and structure, quantum integration can create a solid and balanced integration of religion and science that contains divine values. Quantum integration can fill in the gaps in previous models of integration of religion and science.

Keywords: Integration; quantum; religion; science.

Khulasah

Integrasi agama dan sains belum berkembang sepenuhnya. Beberapa model penyepaduan agama dan sains nampaknya mengandungi kelemahan asas. Artikel ini bertujuan untuk membincangkan integrasi alternatif yang dipanggil integrasi kuantum. Kajian ini merupakan tinjauan literatur menggunakan analisis kandungan berdasarkan sumber primer. Hasil penelitian menunjukkan bahawa integrasi kuantum terdiri daripada tiga struktur iaitu prinsip perpaduan agama dan sains, sikap terbuka antara ahli sains dan pemimpin agama, dan nilai teistik. Struktur integrasi ini merangkumi tiga prinsip asas dan tiga konstruk falsafah. Tiga prinsip asas yang dimaksudkan ialah prinsip tidak bercanggah antara agama dan sains, persamaan, dan keperluan bersama. Tiga konstruk falsafah terdiri daripada pandangan dunia yang tidak materialistik, sumber pengetahuan yang bersatu, keterbukaan, dan nilai teistik. Berdasarkan prinsip, pembinaan falsafah dan strukturnya, integrasi kuantum dapat mewujudkan integrasi agama dan sains yang kukuh dan seimbang yang mengandungi nilai-nilai ketuhanan. Integrasi kuantum boleh mengisi kekosongan model integrasi agama dan sains sebelum ini.

Kata kunci: Integrasi; kuantum; agama; sains.

Introduction

The integration of religion and science seems to have not been developed optimally. In Indonesia, the integration of religion and science mainly incorporates holy verses into scientific studies. Several studies have shown that this model is a general trend in students' final assignments, from undergraduate to doctoral levels.[1] Some guidelines for

[1] H. L. Siregar, "Integrasi Sains dan Islam dalam Pembelajaran Pendidikan Agama Islam," digilib.unimed.ac.id, http://digilib.unimed.ac.id/id/eprint/35872; S. Saifudin, "Integrasi Ilmu Agama dan Sains: Studi Penulisan Skripsi di UIN Syarif Hidayatullah Jakarta," *Profetika: Jurnal Studi Islam* 21(1) Special

integrating religion and science in secondary schools are no different from this model.[2] As Guessoum (b. 1960) wrote, integrating religion and science in the Middle East is more about proving religion from a scientific perspective. The truth claims of science are used to strengthen religious beliefs.[3] In Europe, the integration of religion and science developed by Maurice Bucaille (1920-1998) is no different from that in the Middle East.[4] This phenomenon shows that the integration of religion and science is still in the formal yet substantial area.

Studies on integrating religion and science so far have shown several trends. First, integration by interpreting religion is in line with the truth claims of science. Religion becomes the justification of science. The integration model that has developed in Indonesia falls into this category. Most students' final assignments place verses of the Qur'an to support scientific truth claims.[5] Second, integration by

Issue (2020) 78-90, http://journals.ums.ac.id/index.php/profetika/article/view/11650.

[2] Nur Hasanah & Anggun Zuhaida, "Desain Madrasah Sains Integratif: Integrasi Sains dan Agama dalam Perangkat dan Pelaksanaan Pembelajaran," *Edukasia : Jurnal Penelitian Pendidikan Islam* 13(1) (2018), 155, https://doi.org/10.21043/edukasia.v13i1.3517.; A. Z. Arief, Implementasi Integrasi Antara Agama dan Sains dalam Modernisasi Lembaga Pendidikan Islam di Madrasah Aliyah Unggulan Darul," eprints.unipdu.ac.id, 2018, http://eprints.unipdu.ac.id/id/eprint/1221.

[3] Nidhal Guessoum, *Islam's Quantum Question Reconciling Muslim Tradition and Modern Science* (London: I.B.TaurisandCoLtd, 2011). 148; Zaghlul Najjar, *Min Ayat al-I'jaz al-Ilm fi al-Qur'an* (Cairo: Maktabah al-Shuruq, 2003). 20.

[4] Guessoum, *Islam's Quantum Question*, 126.

[5] Saifudin, "Integrasi Ilmu Agama dan Sains."; K. Kardi, "Integrasi Interkoneksi Sains dan Studi Agama dalam Implementasi *Open Access Repository* di Perguruan Tinggi Keagamaan Islam Negeri (PTKIN)," *Al-Kuttab: Jurnal Kajian Perpustakaan, Informasi dan Kearsipan* 2(1) (2019), 53-62; I. Istikomah, "Integrasi Sains dan Agama di Perguruan Tinggi Sebagai Upaya Mengikis Dikotomi Ilmu," *Tadrisuna: Jurnal Pendidikan Islam dan Kajian Keislaman* 2(1) (2019), 58-70.

bringing science closer to religion to prove the scientific of religion.[6] The *ijmali* method that developed in the Middle East fits into this category. This method uses the workings of science to examine the verses of the Qur'an, so that religious teachings look scientific.[7] Third, the integration of the Ismail Raji al-Faruqi model (1921-1986) in America,[8] the Ziauddin Sardar *ijmali* integration model (b. 1951) in Europe,[9] and the interconnection integration model of Amin Abdullah (b. 1953) in Indonesia.[10]

In addition, several models of integration are developing in Malaysia. Among others, (1) Malaysia's model of Islamization of Naquib al-Attas (b. 1931).[11] This model states that knowledge is not value-free, so knowledge from outside Islam must be aligned with Islamic values when used by Muslim communities.[12] (2) The concept of integration of religion and science developed by Yusof Uthman (b. 1952) and Khalijah Salleh (b. 1947) is called *tauhidik* science. This concept states that science is not only to understand the truth of objects but also to capture the meaning of objects related to God, who created the universe. Eight steps are needed to achieve this goal.

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[6] Ian G. Barbour, "On Typologies for Relating Science and Religion," *Zygon* 37(2) (2002), 345–360, https://doi.org/10.1111/0591-2385.00432.

[7] Najjar, *Min Ayat al-I'jaz al-Ilm fi al-Qur'an*, 20.

[8] Ismail Raji al-Faruqi, *Islamization of Knowledge, General Principles and Workplan* (Washington: International Institute of Islamic Thought, 1982), 70

[9] Ziauddin Sardar, *Explorations in Islamic Science* (London: Mansell, 1989), 112.

[10] M. Amin Abdullah, *Multidisiplin, Interdisiplin dan Transdisiplin (Multidisciplinary, Interdisciplinary and Transdisciplinary)* (Yogyakarta: IB Pustaka, 2021).

[11] Syed Muhammad Naquib al-Attas, *Islam and Secularism* (Kuala Lumpur: ABIM, 1979).

[12] Achmad Khudori Soleh, *Filsafat Islam dari Klasik Hingga Kontemporer (Islamic Philosophy from Classical to Contemporary)* (Yogyakarta: Ar-Ruzz Media, 2016), 239-254.

That is, a) accepting the presence of God as Creator; b) understanding the existence of a relationship between God, humans, and nature; c) building science systematically and objectively; d) incorporating ethical concepts in science; e) getting to know the history of science which is not only the Western version; f) introduce the subjectivity of science; g) incorporate religious values into science; and g) teaching science in Malay so that the Malaysian public easily understands it.[13] (3) Osman Bakar's (b. 1946) concept of integration is Islamic science. This concept states that science must understand the object of study as a manifestation of God so that the ultimate goal of science is to know and unite with God.[14] Osman Bakar's concept is similar to Hussein Nasr's (b. 1946) thoughts regarding sacred knowledge.[15]

These integration models contain several weaknesses. The primary weakness of the first and second models is that the two integration models only move from one side to the other, not an approaching movement from both parties simultaneously. This one-sided movement is not integration, so the building of relations between religion and science becomes fragile. Haught (b. 1942) and Guessoum argue that such a one-sided integration model is inadequate for integrating contemporary religion and

[13] Hazwani Che Ab Rahman, Abdul Latif Samian & Nazri Muslim, "Pemikiran Mohd Yusof Othman dalam Sains Tauhidik ke Arah Membangunkan Tamadun Melayu," *Sains Insani* 2(2) (2018), 29–39, https://doi.org/10.33102/sainsinsani.vol2no2.34.; Nur Asyikin Hamdan, Abdul Latif Samian & Nazri Muslim, "Pandangan Khalijah Salleh Terhadap Sains Tauhidik ke Arah Membangunkan Tamadun Melayu," *Sains Insani* 2(1) (2017), 54–60, https://doi.org/10.33102/sainsinsani.vol2no1.51.

[14] Osman Bakar, *Tahwid and Science: Islamic Perspectives on Religion and Science* (Kuala Lumpur: Arah Publications, 2008).

[15] Hossein Nasr, *Knowledge and the Sacred* (New York: State University of New York Press, 1989).; Hossein Nasr, *The Need for a Sacred Science* (Albany: State University of New York Press, 1993).

science.[16] Meanwhile, the third model also received much criticism. Sardar criticized al-Faruqi's integration method, [17] and Pervez Hoodbhoy (b. 1950) criticized Sardar's *ijmali* method.[18] These criticisms show that there are many gaps in the integration of religion and science that need improvement.

This article aims to show an alternative integration model, which the author calls quantum integration. Namely, a two-way integration pattern between religion and science. Religion and science both move closer to each other so that a strong relationship exists between them. This paper discusses three main things: the basic principles of quantum integration, philosophical constructions, and forms of quantum integration.

Several weaknesses in the previous integration models form the basis of the argument for writing this article. First, placing religion under science can lead to opposition from the clergy. Second, forcing scientific results to support religious understanding does not show a balanced integration. Third, integration is more of a technical nature without a foundation of philosophical principles and thoughts so that it is not solid. Quantum integration is based on fundamental principles and constructed from strict philosophical thinking to become a balanced and effective model of integration of religion and science. Rana Dajani

[16] John F. Haught, *Science and Religion: From Conflict to Conversation* (New York: Paulist Press, 1995); Guessoum, *Islam's Quantum Question*.

[17] Ziauddin Sardar, *The Touch of Midas: Science, Values and the Environment in Islam and the West* (Manchester: Manchester University Press, 1984).

[18] Pervez Amirali Hoodbhoy, *Islam and Science Religious Orthodoxy and the Battle for Rationality* (London: Zed Books, 1991), 75.

emphasized that quantum integration can provide rational scientific phenomena without losing religious value.[19]

Literature Review

Quantum Integration

The term quantum integration is commonly used in exact disciplines, such as mathematics, physics, and engineering.[20] In religion and science, the term quantum integration is interpreted as two movements close to each other and open to each other simultaneously from religion and science.[21] Amin Abdullah (b. 1953) stated that the close and open movement between religion and science is significant because this open movement can create new religious thoughts that encourage independent discussion and dialogue between religion and science.[22] Rana Dajani emphasized that quantum motion can balance religion and science.[23]

Quantum integration can produce results that transcend educational gaps that emphasize contemplative

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[19] Rana Dajani, "Evolution and Islam's Quantum Question," *Zygon* 47(2) (2012), 343–353, https://doi.org/10.1111/j.1467-9744.2012.01259.x.

[20] Stefan Heinrich, "Quantum Integration in Sobolev Classes," *Journal of Complexity*, 19(1) (2003), 19-42, https://doi.org/10.1016/S0885-064X(02)00008-0; Reza Ahangar, "Quantum Integration Using Dirac's Delta Function," *New Horizons in Mathematical Physics* 4(1) (2020), 1-13, https://doi.org/10.22606/nhmp.2020.41001; Aman Kaushik & Rohit Narwal, "Integration of Quantum Computing with IoT," *International Journal of Engineering and Advanced Technology* 9(4) (2020),1307-1311, https://doi.org/10.35940/ijeat.d7931.049420.

[21] Achmad Khudori Soleh, "Pendekatan Kuantum dalam Integrasi Agama dan Sains Nidhal Guessoum (A Quantum Approuch to the Integration of Religion and Science Nidhal Guessoum)," *Ulul Albab Jurnal Studi Islam* 19(1) (2018), 119–141, https://doi.org/10.18860/ua.v19i1.4937.

[22] M. Amin Abdullah, "Religion, Science, and Culture: An Integrated, Interconnected Paradigm of Science," *Al-Jami'ah: Journal of Islamic Studies* 52(1) (2015), 175, https://doi.org/10.14421/ajis.2014.521.175-203.

[23] Dajani, "Evolution and Islam's Quantum Question," 343.

practices such as mindfulness, reflexivity, and empathy drawn from sciences such as mathematics and physics.[24] On the religious side, as written by Ejtehadian, the quantum integration model can change theological and philosophical views because this integration can bring together religious interpretations and scientific phenomena.[25] On the other hand, on the scientific side, quantum mechanics can demonstrate a universal theory that governs the basic principles of how the universe functions.[26]

Four aspects must be present in the process of quantum integration: (1) The basis of the atheistic worldview; (2) Orientation to religious values or universal values can be understood; (3) The openness of science to accept revealed texts as an inseparable part of reality with being a source of knowledge; (4) The awareness of the clergy to accept the holy book was studied by scientists using various approaches and methods.[27]

[24] Kathryn Pavlovich, "Quantum Empathy: An Alternative Narrative for Global Transcendence," *Journal of Management, Spirituality & Religion* 17(4) (2020), 333–347, https://doi.org/10.1080/14766086.2019.1706626; Hossein Ejtehadian, "Integrating Bohmian and Sadra's Metaphysic to Explain Divine Action," *The Journal of Philosophy of Religion* 8(1) (2019), 63–81, https://doi.org/10.22034/RS.2019.4039; A. Ferent, "I Am the First Who Explained Religion with Science, Mathematics and Physics in Mankind History. Religion and Quantum Evolution," Researchgate.Net, June 2019.

[25] Ejtehadian, "Integrating Bohmian and Sadra's Metaphysic," 63.

[26] Orsolya Bányai, "Quantum Mechanics and Law: What Does Quantum Mechanics Teach Us?," in *Ecological Integrity in Science and Law* (Cham: Springer International Publishing, 2020), 147–157, https://doi.org/10.1007/978-3-030-46259-8_13.

[27] Achmad Khudori Soleh, *Integrasi Quantum Agama dan Sains (Quantum Integration of Religion and Science)*, ed. Erik Sabti Rahmawati (Malang: UIN Malang Press, 2020).

Religion-Science Relations

Historically, the relationship between religion and science is related to psychological and creative aspects.[28] Rutjens and Preston stated that on the psychological aspect, the relationship between religion and science can be seen in three human psychologies. Explanation, control, and meaning form the central components of the relationship between science and religion.[29] In the creative aspect, the relationship between religion and science can be seen in the ideas, definitions, traditions, and social artifacts that emphasize the theories and methods in religious studies that underlie this relationship as objects of scientific analysis.[30]

The relationship between religion and science is only sometimes positive. Raymond and Sharma's research shows that the relationship between religion and science

[28] Francesco Malaguti, "Philosophical Perspectives on the Relationship Between Religion and Science: Averroes, Maimonides, Thomas Aquinas and Galileo," in *Jewish-Muslim Relations Historical and Contemporary Interactions and Exchanges*, ed. Margaret Rausch & Ednan Aslan (Nature, Switzerland: Springer, 2019), 101–117, https://doi.org/10.1007/978-3-658-26275-4_7.; Nicole Annis, "The Relationship between Religion and Science: Illustrated through Creationism and Humanism," University of Gävle, 2018, https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1284587&dswid=-1349.

[29] Bastiaan T. Rutjens & Jesse L. Preston, "Science and Religion: A Rocky Relationship Shaped by Shared Psychological Functions," in *The Science of Religion, Spirituality, and Existentialism*, ed. Clay Routledge Kenneth E. Vail (Cambridge: Academic Press, 2020), 373–385, https://doi.org/10.1016/B978-0-12-817204-9.00027-5.

[30] Hava Tirosh-Samuelson, "Judaism and the Dialogue of Religion and Science: A Personal Journey," *Theology and Science* 16(4) (2018), 388–414, https://doi.org/10.1080/14746700.2018.1525220; Jonathon McPhetres & Thuy-vy vy T. Nguyen, "Using Findings from the Cognitive Science of Religion to Understand Current Conflicts between Religious and Scientific Ideologies," *Religion, Brain & Behavior* 8(4) (2018), 394–405, https://doi.org/10.1080/2153599X.2017.1326399; Laura Jean Vollmer, "The Relationality of Religion and Science," University of Groningen, 2017, https://core.ac.uk/download/pdf/148332041.pdf.

can experience conflict. Conflict occurs when religion and science are seen as different and contradictory.[31] From an epistemological perspective, the relationship between religion and science can be expressed in several forms, such as conflict, differentiation, interaction, and adaptation, which are viewed from various angles from various epistemological perspectives. [32] Barbour ensures that integration is the best model among the many models of the relationship between religion and science.[33]

The relationship between religion and science can lead to changes in public perception of the meaning of science and religion. McPhetres and Nguyen's research shows that public understanding of religious values influences their acceptance of science.[34] In contrast, public thinking toward science has shaped people's rational choices toward religion.[35] In America, the relationship between religion and science has given rise to differences of opinion and controversy about the role of religion in schools.[36]

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[31] Olusanya Kayode John Ogunade Raymond, "Interplay Between Religion and Science: Level of Inclusion and Relevance in Religious Studies in Nigeria," in *Encouraging Interdisciplinary Research and Innovation for the Betterment of Humanity* (Kabianga: University of Kabianga, 2018), 356–374.; Subhash Sharma, "Quantum Vedanta: Towards a Future Convergence of Science and Spirituality," *SSRN Electronic Journal* (2018), https://doi.org/10.2139/ssrn.3204710.

[32] Maryam Shamsaei; Abdollah Gholami, "Exploring the Epistemological Tools and Sources of Science and Religion," *Trends in Pharmaceutical Sciences* 7(2) (2021), 93–104, https://doi.org/10.30476/TIPS.2021.90960.1093.

[33] Barbour, "On Typologies for Relating Science and Religion," 345.

[34] McPhetres & Nguyen, "Using Findings from the Cognitive Science," 394.

[35] Katherine Sorrell & Elaine Howard Ecklund, "How UK Scientists Legitimize Religion and Science Through Boundary Work," *Sociology of Religion* 80(3) (2019), 350–371, https://doi.org/10.1093/socrel/sry047.

[36] Timothy L O'Brien & Shiri Noy, "Political Identity and Confidence in Science and Religion in the United States," *Sociology of Religion* 81(4) (2020), 439–361, https://doi.org/10.1093/socrel/sraa024; Laura

Methodology

This research is a literature review.[37] The object is about the integration of religion and science. The data source is based on written data divided into three parts, namely primary, secondary, and general. Primary sources are based on the integration of religion and science written in the first person. Sources secondary are based on integrating religion and science from a character described by others. General sources related to general data or theories related to the subject. This study uses primary sources as the primary, secondary data, and available sources as supporting or confirming material.

The data obtained were then analyzed using the content analysis method.[38] This analysis explains the previous concepts of integration of religion and science and the concept of quantum integration which consists of three things. Namely, the fundamental principles, philosophical construction, and theistic values. During the analysis process, errors in reading and understanding may occur due to improper selection and sorting of data. This study conducted a cross-check by reviewing the data used, comparing it with other primary data, or comparing it with secondary data that discusses this issue.[39]

May, Thomas Crisp & Mehmet Gultekin, "The Intersections of Religion and Science in NSTA-OSTB Biographies," *Children's Literature in Education* 52(4) (2021), https://doi.org/10.1007/s10583-021-09460-x.

[37] Hannah Snyder, "Literature Review as a Research Methodology: An Overview and Guidelines," *Journal of Business Research* 104 (2019), 333–339, https://doi.org/10.1016/j.jbusres.2019.07.039.

[38] Satu Elo et al., "Qualitative Content Analysis," *SAGE Open* 4(1) (2014), 215824401452263, https://doi.org/10.1177/2158244014522633.

[39] Robert G. Turner, "Double Checking the Cross-Check Principle," *Journal of the American Academy of Audiology* 14(5) (2003), 269–277, https://doi.org/10.1055/s-0040-1715737.

The results of the analysis are then reviewed again using discourse analysis.[40] In this section, the results presented are compared with other data using the comparative method, tracing their historical roots using the historical method or predicting their logical consequences using the interpretive analysis method.[41] Based on this, the most important conclusions are drawn.

Results

Fundamental Principles

There are three principles underlying the quantum integration of religion and science. These three principles are interrelated entities and form the foundation for building quantum integration. The three principles referred to are the principle of not contradicting, the principle of equality, and the principle of mutual need.

The concepts of Ibn Rushd (1126-1198) and Galileo Galilei (1564-1642) of revelation and the universe that are the source of religion and science are the basis for the principle of non-contradictory. Ibn Rushd and Galilei assert that revelation and the universe are the sources of religion, and science comes from the same source, namely God.[42] Revelation is God's word, while the universe is God's creation. Everything that comes from the same source must be in harmony. Therefore, the laws of nature and revelation

[40] Audrey Alejandro, "Reflexive Discourse Analysis: A Methodology for the Practice of Reflexivity," *European Journal of International Relations* 27(1) (2021), 150–174, https://doi.org/10.1177/1354066120969789.

[41] Dean C. Adams & Michael L. Collyer, "Phylogenetic Comparative Methods and the Evolution of Multivariate Phenotypes," *Annual Review of Ecology, Evolution, and Systematics* 50(1) (2019), 405–425, https://doi.org/10.1146/annurev-ecolsys-110218-024555; Jan Pringle et al., "Interpretative Phenomenological Analysis: A Discussion and Critique," *Nurse Researcher* 18(3) (2011), 20–24, https://doi.org/10.7748/nr2011.04.18.3.20.c8459.

[42] Denis Alexander, *Rebuilding the Matrix: Science and Faith in the 21st Century* (Grand Rapids: Zondervan, 2001), 84.

cannot be contradictory.[43] Explicitly, Galilei wrote as follows,

> "The holy Bible and the phenomena of nature proceed from the divine Word, the former as the dictate of the Holy Ghost and the latter as the observant executrix of God's commands. A hundred passages of holy Scripture .... teach us that the glory and greatness of Almighty God are marvelously discerned in all his work and divinely read in the open book of heaven".[44]

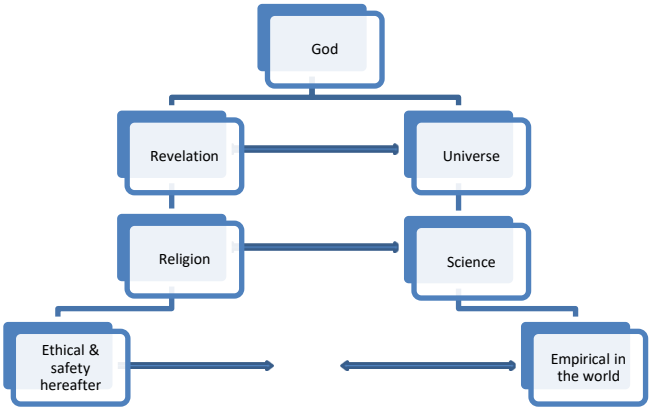
The principle of equality is related to religion and science due to the interpretation of revelation and the universe. Religion is the result of the interpretation of revelation, and science is the result of the interpretation of reality. Religion and science are the same results of interpreting God's words and works so that they are on an equal footing. The position of religion is not higher than science, and on the contrary, science is not more important than religion. Al-Farabi (870-950), one of the significant figures in Islamic philosophy, stated that the science of religion is not higher than philosophy.[45] Guessoum called religion and science bosom sisters because they are both the result of the interpretation of revelation and reality, whose revelation and reality come from the same source, namely Allah.[46]

The thoughts of Ibn Rushd on the areas of religious and scientific studies are the basis for the principle of mutual need. Science studies practical problems globally while religion makes ethical demands and safety in the

[43] Ahmad ibn Rushd, "Fasl al-Maqal wa Taqrir ma bayn al-Shari'ah wa al-Hikmah min al-Ittisal," in *Falsafah Ibn Rushd* (Beirut: Dar al-Afaq, 1978), 13–38.
[44] Alexander, *Rebuilding the Matrix*, 84.
[45] Abu Nasr al- Farabi, *Ihsa' al-'Ulum*, ed. 'Ali Bumulham (Cairo: Dar al-Hilal, 1996).
[46] Guessoum, *Islam's Quantum Question*, 61.

hereafter. Ibn Rushd states that we need the concept of happiness. What is happiness? Is it true that the soul can achieve happiness? How to get it? What is the condition of the soul after death of the body? Science does not explain that, but religion does provide a guide. Therefore, religion and science need and complement each other so that the order of life becomes whole and in harmony.[47] Figure 1 illustrates the relationship of the three fundamental principles: the principles of not contradicting, equality, and mutual need.

Figure 1: The relation of the three fundamental principles.



Philosophical Construction

The philosophical construction composing quantum integration is the interrelation of three issues: worldview, epistemology, and values. The explanation of the three philosophical constructions is as follows.

Worldview deals with ontological issues. A non-materialistic worldview is a basis for quantum integration. Historically, the ontological basis of non-materialistic has

[47] Ahmad Ibn Rushd, "al-Kashf 'an Manahij al-Adillah fi 'Aqa'id al-Millah," in *Falsafah Ibn Rushd* (Beirut: Dar al-Afaq, 1978), 45–142.

been the basis for medieval Islamic science,[48] and Western science until the 18th century.[49] Lovejoy (1873-1962) stated that the concept of a hierarchical universe-building that is physical is the most well-known concept in science in the 18th century West.[50] After that, modern science removed the metaphysical basis. Modern science only bases itself on a materialistic basis. This change indicates that the ontological basis is optional. One can use a materialistic, theistic, deistic, and even atheistic worldview without losing the objectivity of science. Guessoum states that the choice of ontological basis does not damage the scientific way of working, demanding an objective attitude.[51]

Quantum integration chooses a non-materialistic worldview basis for three reasons; (1) Methodologically, this basis can encourage scientists to continue exploring sensory data to become more prosperous and complete. Many realities cannot be understood and accessed, so they must adopt a worldview that is not merely materialistic; (2) Psychologically, this worldview can provide humans with material, spiritual, and moral satisfaction; (3) This worldview is more in line with human religious awareness and experience than a materialistic worldview, let alone atheistic.

Epistemology is concerned with systems of thinking. Currently, the workings of science only accept something that can be proven empirically or through experiments. Richard P. Feynman (1918-1988) stated that no matter how good a theory is if it is not in harmony with experimental or

[48] Eric Winkel, "Tawhid and Science: Essays on History and Philosophy of Islamic Science," *The Muslim World* 83(3–4) (1993), 329–335, https://doi.org/10.1111/j.1478-1913.1993.tb03584.x.
[49] Alexander, *Rebuilding the Matrix*, 82.
[50] Arthur Onchen Lovejoy, *The Great Chain of Being* (Massachusetts: Harvard University Press, 2001), vii.
[51] Guessoum, *Islam's Quantum Question*, 175.

empirical evidence, it must be wrong.[52] Meanwhile, religion uses the parameters of the holy book. Scripture is the primary basis of religious knowledge. The knowledge that does not refer to the scriptures is wrong. Therefore, according to Feynment, religion and science have different bases and parameters of truth.

Quantum integration places scripture and empirical reality as an inseparable part of its position as a source of knowledge based on the understanding that they come from the same source, namely God. Galilei stated, "The gospel and natural phenomena go on because they are the same word of God; the first is the result of the dictation of the Holy Spirit, the second is the obedient executor of all His commands."[53] Previously, Ibn Rushd emphasized that revelation and the universe are inseparable because they both come from the same source, namely God.[54] Substantially, the unification of scripture and the universe as a knowledge source can maintain the emergence of the inconsistency of the teachings of the scriptures and natural laws. In the next phase, this principle of unity can minimize the understanding of independence and even conflict between religion and science, as noted by Barbour (1923-2013).[55]

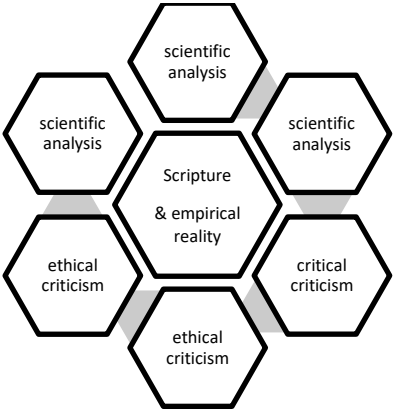
Based on the unity of the scriptures and the universe, quantum integration requires the willingness and openness of religious leaders and scientists. On the religious side, sacred scriptures whose interpretation by religious leaders must be studied by scientists with various approaches and methods. On the other hand, scientific analysis that relies solely on empirical evidence must accept ethical criticism from religion. Ibn Rushd states that religion provides

[52] Guessoum, *Islam's Quantum Question*, 67.
[53] Alexander, *Rebuilding the Matrix*, 84.
[54] Ibn Rushd, "Fasl al-Maqal," 14.
[55] Barbour, "On Typologies for Relating Science and Religion," 345.

ethical teachings and concepts of salvation that are not present in science.[56]

The willingness and openness of religious leaders and scientists are essential in quantum integration. The historical analysis of Sachiko Murata (b. 1943) and William Chittick (b. 1943) shows that the emergence of a diversity of understandings of the Islamic scriptures and the open attitude of religious scholars to this diversity of understanding have become important factors that have encouraged the development of science and religious thought in the Middle Ages.[57] The Qur'an itself shows the diversity of meanings and understandings of each verse.[58] The Quranic verses have prepared themselves to be understood from various approaches and methods, and the results of their interpretations are equally valid. Therefore, Ibn Rushd stated that the public could understand the verses of the Qur'an according to their respective levels of ability.

Figure 2: The Unity of Revelation and the Universe



[56] Ibn Rushd, "al-Kashf 'an Manahij al-Adillah," 117.
[57] Guessoum, *Islam's Quantum Question*, 50.
[58] Muhammad Asad, "Symbolisme and Allegory in the Qur'an," http://www.geocities/masad02/appendix1.

The value system is related to specific values that must be a guide. These values are universal values culminating in the highest value, namely the recognition of the existence of God. Historically, Ferguson (b. 1941) stated that belief in the existence of God as a creator was once a common tradition in scientific thought in the 18th century West. This belief can be classified into the following features:

1. That the universe is rational, reflecting the intelligence and faithfulness of its Creator. The rationality of this universe, which is called natural law, can be understood by humans.
2. The universe has contingency, meaning that the objects we see may differ from what we imagine. It is chance or choice that makes them what they are. Therefore, knowledge can be obtained by conducting experiments and observations
3. There is something that is an Objective Reality. Because God exists, oversees, and knows everything, truth exists behind everything that appears; the senses can observe that.
4. There is unity in the universe. Everything is based on one explanation: one God, one equation, and one logical system.[59]

There are two reasons why this value system culminating in God should be part of the philosophical construction of quantum integration. First, this value system requires scientists to believe in God as the creator and God as the sustainer of the universe so that scientists will not treat objects of science carelessly. Second, this value system seems more in line with the properties of the observed world. Complex world problems and intricate relationships that astonished Einstein (1879-1955), as well as the beauty of the universe that has guided modern

[59] Kitty Ferguson, *The Fire in the Equations: Science, Religion and the Search for God* (Grand Rapids: MI Erdmans Publ, 1994).

physicists such as Paul Dirac (1902-1984), Erwin Schrodinger (1887-1961), and Alvin Martin Weinberg (1915-2006) to believe in God, seems more suitable if framed in the view of theistic values like this.[60]

Quantum Integration Model

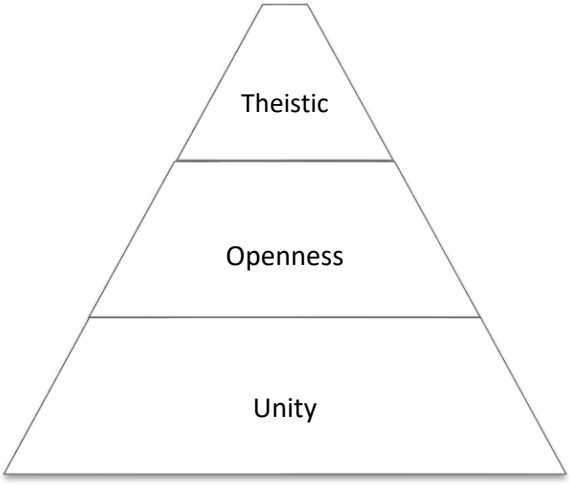
Quantum integration is composed of three stratified structures. The first and basic level are beliefs about the unity of religion and science. This belief consists of three fundamental principles: the principle of not contradicting, the principle of equality, and the principle of mutual need. These three principles are one unit and function to bind religion and science to not separate or even contradictory.

The second level is openness. This openness consists of two things, namely, being open to various sources of knowledge and being open to different perspectives. A religious person must accept a scientific perspective, and scientists accept religious scriptures as a reference. This openness ensures there is two-way communication and integration between religion and science.

The third level is in the form of direction and purpose. Quantum integration directs all religious and scientific work to recognize the existence of God. This theistic direction is to provide an ethical frame for science so that scientific work can lead humans to become representatives of God (Allah's caliph) to prosper the earth, not to 'eliminate' God from the universe. Figure 3 is a picture of the quantum integration structure.

[60] Guessoum, *Islam's Quantum Question Reconciling Muslim Tradition and Modern Science*. 175.

Figure 3: Structure of Quantum Integration



Discussion

Quantum integration uses three fundamental principles: the principle of not contradicting, the principle of equality, and the principle of mutual need. The principle of non-contradictory between religion and science is similar to the principle of monotheism in the integration of religion and science of Ismail al-Faruqi (1921-1986). Al-Faruqi stated that the principle of monotheism ensures the unity of revelation and nature so that there is no conflict between natural law (*sunnatullah*) and the truth of revelation. Consequently, a Muslim must be open to various new scientific findings because these new findings are patterns of God's infinite will. [61] On the other hand, the development of science should not be autonomous, apart from the teachings of revelation. Ziauddin Sardar emphasized that the development of science must be theistic so that it is in harmony with the truth of revelation.[62]

[61] Faruqi, *Islamization of Knowledge*, 66.
[62] Guessoum, *Islam's Quantum Question*, 127.

The equivalence principle of quantum integration is in line with the thought of al-Farabi, a medieval Muslim Neoplatonist. Al-Farabi stated that religion teaches revelation, while philosophy results from philosophical reflection. Revelation and philosophy originate from the same source, namely the active intellect. The active intellectual in Islamic theology called Jibril is not only an angel who conveys revelations to a Prophet and provides philosophical inspiration to a philosopher. Therefore, the science of religion and science, derivative of revelation and philosophy, are equal. Religious knowledge is not higher in rank than science, and vice versa.[63]

The principle of mutual need is in line with the teachings of Ibn Rushd (1126-1198), a Muslim Aristotelian figure. Ibn Rushd emphasized that religion and science have different areas of study. Science explains human life logically, while religion explains problems after death.[64] In other words, religion provides information that does not exist in science, while science logically explains religious teachings. Religion and science need each other for life to be complete and whole. Albert Einstein (1879-1955) stated that religion without science is lame, science without religion is blind.[65]

Based on this description, the fundamental principle of quantum integration means accommodating three important schools of Islamic thought. Namely, Islamic Neo-Platonism, Islamic Aristotelianism, and modern Islamic thought. Madjid Fakhry (1923-2021) stated that Islamic Neo-Platonism is an Islamic philosophical thought

[63] Abu Nasr al-Farabi, *Mabadi' Ara' Ahl al-Madinah al-Fadhilah*, ed. Richard Walzer (Oxford: Clarendon Press, 1985), 218; Louis Gardet, "al-Tawfîq bayn al-Din wa al-Falsafah 'ind al-Farabi," in *al-Farabi wa al-Hadarah al-Insaniyyah*, ed. Ibrahim Samara'i (Baghdad: Dar al-Hurriyah, 1976), 127-142.

[64] Ibn Rushd, "al-Kashf 'an Manahij al-Adillah," 117.

[65] Marko Uršič, "Einstein on Religion and Science," *Synthesis Philosophica* 42(2) (2006), 267–283.

that adopts and develops the thoughts of Plato (428-348 BC) and Plotinus (204-270), as did al-Farabi (870-950) and Ibn Sina (980-1037). Meanwhile, Islamic Aristotelianism is an Islamic philosophical thought that adopts and develops the thoughts of Aristotle (384-322 BC), as did Ibn Rushd (1126-1198). [66] These three perspectives are the main streams in Islamic thought, so integrating the three can become a solid fundamental principle for quantum integration. In addition, these principles can create a balance between religion and science, as written by Rana Dajani,[67] to give birth to new religious thoughts as hoped by Amin Abdullah (b. 1953).[68]

The philosophical construction of quantum integration consists of three elements, namely worldview, epistemology, and values. An un-materialistic worldview can provide several advantages:

1) The worldview is not materialistic in line with religious teachings because all religions teach an ontological view that is not materialistic. No religion rejects metaphysical reality.
2) An un-materialistic worldview can mutually reinforce the fundamental principles of quantum integration.
3) An un-materialistic worldview can be the basis for the principle of monotheism from the Islamization of knowledge by al-Faruqi (1921-1986) and Ziauddin Sardar (b. 1951).
4) A non-materialistic worldview does not hinder a critical and objective attitude in the development of science.

[66] Majid Fakhry, *Al-Farabi: Founder of Islamic Neoplatonism* (Oxford: Oneworld, 2002); Majid F. Fakhry, "Aristotelian and Neo-Platonic Tendencies: Al-Farabi (d. 950), Ibn Sina (d. 1037), and Ibn Rushd (d. 1198)," in *Ethical Theories in Islam* (BRILL, 1994), 78–92, https://doi.org/10.1163/9789004451131_011.

[67] Dajani, "Evolution and Islam's Quantum Question."

[68] Abdullah, "Religion, Science, and Culture."

This conclusion is in line with the statement of Guessoum that the ontological view is a choice, and any ontological choice of scientists does not hinder the objectivity of science.[69]

Quantum epistemology places revelation, ratio and reality as a unit. This epistemology can guarantee that religion and science will not be separated or even contradictory. Therefore, this epistemology can solve the conflict between religion and science, as in Raymond,[70] Sharma,[71] and Shamsaei and Gholami's research.[72] In addition, this epistemology can also be the basis for the integration typology proposed by Ian Barbour (1923-2013).[73]

The principle of the unity of revelation, reason, and reality in quantum integration is in harmony with the thoughts of the integration of religion and science by Abu Hasan al-Amiri (d. 992). 'Abd al-Hamid al-Ghurab, in his introduction to *Kitab al-I'lam bi Manaqib al-Islam* by al-Amiri, stated that al-Amiri carried out the integration of religion and science based on four principles. That is, (1) revelation is always in harmony with rational reasoning so that it is impossible to contradict between the two; (2) Islam is a religion that orders its followers to master useful knowledge; (3) All knowledge is built based on demonstrative methods so that no conclusions are drawn unless based on logical evidence; (4) Physical science and experiments are carried out not to find out the truth of the object but to take lessons from the phenomenon of the

[69] Guessoum, *Islam's Quantum Question*, 175.
[70] Ogunade Raymond, "Interplay Between Religion and Science," 356.
[71] Sharma, "Quantum Vedanta".
[72] Shamsaei & Gholami, "Exploring the Epistemological Tools," 93.
[73] Barbour, "On Typologies for Relating Science and Religion," 345.

object.[74] Al-Amiri himself, concerning the relationship between religion and science, writes as follows,

> "Knowledge is divided into two forms, *milliyah*, and *hikmiyah*. *Milliyah* is the sciences based on the teachings of the Prophets, *hikmiyah* is the sciences developed by wisdom experts (philosophers)."
>
> "The principles of *milliyah* knowledge are clear reasoning and supported by correct demonstrative methods. Based on this, what is ordered by true religion cannot be contrary to rational reason."[75]

The structure of quantum integration consists of three levels. This structure is similar to the structure of religion and science of Albert Einstein (1879-1955) but differs in content. The structure of quantum integration is composed of the principle of the unity of religion and science, openness, and theistic ethics, while the structure of Einstein's religion and science is composed of religious attitudes, metaphysical views, and theoretical physics.[76] Roy D. Morrison asserted that Einstein's relation between religion and science comprises three such structures.[77] This integration structure is also different from the integration aspect of Soleh, which consists of four things, namely (1) theistic worldview; (2) universal values; (3) scientific openness; and (4) awareness of religious leaders.[78]

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[74] Abu Hasan al-Amiri, *Kitab al-I'lam bi Manaqib al-Islam*, ed. 'Abd al-Hamid al-Ghurab (Riyadh: Dar al-Asalah wa al-Thaqafah, 1988), 17-18.

[75] Al-Amiri, *Kitab al-I'lam*, 80 & 83.

[76] Albert Einstein, "Science and Religion," *Nature* 146, no. 3706 (November 1940): 605–607, https://doi.org/10.1038/146605a0.

[77] Roy D. Morrison, "Albert Einstein: The Methodological Unity Underlying Science and Religion," *Zygon* 14(3) (1979), 255–266, https://doi.org/10.1111/j.1467-9744.1979.tb00360.x.

[78] Soleh, *Integrasi Quantum Agama dan Sains*.

Conclusions

Based on the description above, several conclusions are presented. First, quantum integration is composed of three stratified structures. The lowest structure is the principle of the unity of religion and science, then the attitude of openness, and the peak is theistic values. The principle of the unity of religion and science itself consists of three fundamental principles: the principle of not contradicting, the principle of equality, and the principle of mutual need. These three principles form the foundation for quantum integration. The second structure is a system of thinking that places the scriptures and the universe as a unified source of knowledge. This second structure requires an open attitude from both scientists and religious leaders so that new findings are created due to the integration of religion and science. The third structure, which is the peak, is the theistic value that unites religion and science values.

Quantum integration with such structures has several advantages over other integration models; (1) have a basis that unites and binds religion and science to not separate or even contradictory; (2) placing religion and science in an equal position and needing each other to create a balanced dialogue between the two; (3) there is an openness to accept other parties' perspectives so that there is no exclusivity and claims to be the right party; and (4) theistic values that become the spirit of religion and science to unite the two truly.

Second, this paper makes an important contribution, namely a new concept of integrating religion and science, which the author calls quantum integration. The author has mentioned several advantages of this concept. This quantum integration with all its advantages can cover the shortcomings of previous models of integrating religion and science to create new constructive thinking.

Third, this paper is a philosophical concept, not yet in an operational form, let alone in the form of an educational

curriculum. Therefore, this paper suggests that quantum integration is translated into operational forms. Ismail al-Faruqi emphasized that concepts of thought such as integrating religion and science need to be operationalized to the syllabus and available references on campus so that their forms are clear and can be implemented properly.

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