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Implementation of the Integration of Science and Islam in Islamic Education: Strategies for Building a Non-Dichotomy Paradigm

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ABSTRACT

This research responds to the real challenges in madrasahs, where low integration of Islamic knowledge with scientific education is hindered by limited teacher competencies and inadequate learning facilities. Using a library research method supported by case studies of Islamic Religious Education laboratories, this study aims to clarify the objectives and relationship between science and Islam as well as the challenges and practical solutions for integration. Findings show that integration is a complementary process where science strengthens religious understanding (faith), while Islam guides the objectives and orientation of human endeavors. Practical strategies include interdisciplinary curriculum development, teacher training to improve qualifications, and establishing Islamic Religious Education laboratories that use natural phenomena as learning media. These laboratories serve as places for practising and researching Islamic teachings, enhancing students' competence and stimulating scientific attitudes. The study's implications offer concrete benefits for educators by providing effective teaching strategies, for students by fostering a holistic worldview connecting material and spiritual dimensions, and for policymakers by informing policies and programs supportive of science-Islam integration in educational institutions. This integrative approach is vital for developing comprehensive education in madrasahs that addresses contemporary educational and spiritual needs, enhancing learning quality and educational infrastructure.

Introduction

Science is generally understood in an organised way, so science can refer to any object or concept that can be understood by all members of humanity. Islam encourages its adherents to study Islam and science equally, but many Muslims separate the two. In the end, Muslims faced downfall and a sense of helplessness as their success in various professions did not carry over to other periods (Mahrisa, 2022) . The Muslim community began to shrink in the 15th century, when its

scientific spirit began to fade. On the other hand, thanks to tremendous advances in various sciences and technologies, the West today dominates the world in terms of civilisation. The world is developing so rapidly today that almost every industry is developing relentlessly, with education leading the way. There is a failure in society, particularly Muslim society, despite this rapid development. The interests of people and the subjects they prioritise in their studies determine this (Wanida & Anwar, 2024) . For example, students who prioritise general studies over religious studies and vice versa.

In Islam, the first revelation received by the Prophet signalled this demand for integration. Lafadz iqra' is a command to require the development of knowledge, while bi ism rabbik, requires moral and religious development. Armahedi Mahzar claims that early Islamic science and civilisation of the Umayyad and Abbasid eras were integrated on this foundation. Indeed, from the time of al-Kindi, the earliest Muslim philosopher, to its peak at the time of Ibn Rushd, the concept of al-taufiq bain al-din wa al-falsafah (integration) has emerged as a major concern in the Islamic world The evolution of Islamic thought and philosophy (M. Yusuf et al., 2022) .

However, it is unfortunate that the integrated spirit and culture of science among Sunni Muslims in the Islamic East was largely stalled during the period of Islamic decline, particularly after the retreat of Baghdad in 1258 CE. Baghdad, once the centre of Islamic civilisation and governance, first passed into the hands of the Mongol invasion led by Hulagu Khan, grandson of the famous conqueror Genghis Khan, known for his ruthlessness. The city then fell again during the invasion of American forces and their allies, which brought President Saddam Hussein's rule in Iraq to an end. From then until the 19th and even 20th centuries, Islamic scholarly tradition and culture transformed into an "atomistic dichotomy", separating `ulum al-din (religious sciences) from science and philosophy (general sciences). In this period, the concept of knowledge became limited to religious studies, and Islamic respect for scholars (ulu al-`ilm, uli al-albab, uli al-abshar, uli al-nuha) also narrowed (Irawati et al., 2024) . This respect becomes limited to ulama, particularly faqih or kyai who specialise in Islamic law that only focuses on rituals such as purification, prayer, zakat, fasting and hajj.

Science and technology have always had an impact on religious discussions. This makes the topic of integrating science and religion important. Science, which focuses on the natural world, begins to address moral and religious issues by asking: What is the proper use of knowledge? Where are the limits of scientific enquiry? Where is the progress of science headed? Scientists seek answers from morality and religion because these concerns are increasingly important (Sarbaini et al., 2024). Therefore, conversations about the merging of science and religion are inevitable. The greatest thing that upholds human dignity remains science.

In the context of contemporary Indonesia, the integration of science and religion in education still faces significant challenges.

Studies in madrasas and Islamic schools reveal that the integration is often weak and largely operational rather than conceptual. Teachers frequently have limited ability to connect scientific concepts with Islamic values, undermining the holistic learning process. For instance, at MTsN Kota Salatiga, integration efforts have been confined to linking science lessons to Quranic verses without deeper pedagogical integration. Similarly, research among science teachers in Islamic high schools found that although some integration exists, it mainly centers on learning materials, and much work remains to strengthen the overall learning experience.

Moreover, limitations in practicum facilities and teaching resources hinder the effective integration of science and religion in Indonesian madrasas and public schools. Constraints such as inadequate laboratories and teaching aids reduce opportunities for experiential learning that links scientific inquiry with Islamic ethical frameworks. Additionally, no standardized policies or clear curriculum guidelines comprehensively address the integration, resulting in diverse and inconsistent practices across institutions .

Based on research conducted by Azlansyah Hamka and KZ Saputro on the integration of science with Islamic science, where the research describes the integration of curriculum, subjects and learning models. However, in the study there was no more complete description of the relationship between science and Islam and the importance of integration (Azlansyah & Saputro, 2022) . So to cover these shortcomings, in this article, researchers are interested in describing the concept of science integration in the view of Islam. To examine this issue, this research is intended to examine the meaning of science integration, then, the relationship between science and Islam, and the importance of integration. This article will at least provide answers to various problems that develop in society with the hope that it will create an understanding that is wise and in accordance with developments in the current era.

Literature Review

Studies on science-religion integration reveal that this discourse has been a continuing issue throughout the history of Islamic civilisation. From al-Kindi to Ibn Rusyd In the classical time period scholars as the thinker al-Kindi and the philosopher Ibn Rusyd introduced idea that religion and science were two sides of the same coin and widely established the separation between Religion and science. Al-Ghazali believed that "knowledge" is divided into two categories fardhu'ain (individual duty) and fardhu kifayah (communal obligations). Both are significant influences in the configuration of the balance of human life (Akbarizan, 2014; Yusuf, 2021). This integrated tradition was disrupted post the fall of Baghdad, creating duality between 'ulum al-din and science, and prioritizing religious knowledge and marginalizing science (Irawati et al., 2024). As a result, Muslims are behind in the competitive sectors of science and technology.

Recent research highlights the need for reconstructing the science-integrated paradigm to meet the challenges of the times. Various research highlight to

integrate the learning of science from religion, not only capability to master science concept of theoretical but also a competence in spiritual life and moral (Azlansyah & Saputro, 2022; Kurniasih et al., 2023). This integration is deemed important as the development of modern science originating from the West tends to depart from secular framework and lack divine values (Chanifudin & Nuriyati, 2020). So Islam has this unique dual perspective; science is the engine of material progress and religion provides moral direction and sense of purpose. so bringing the two in harmony can lead to a balance of temporal and spiritual wants.

Nonetheless some tensions persist in the midst of struggles to effectively harmonize science and religion, particularly in the educational arena. Some of the challenges currently faced are: the low quality of teachers who understand both fields, limited facilities and infrastructure, and the existing strong divide between general science and religious science in the education system (Darsyah, 2023; Sagita et al., 2024). The proposed solutions are to enhance the competence of teachers with ongoing training, to create a curriculum that is interdisciplinary in nature, to have religious educational laboratories that are technology-based, and to promote academic discussion between scientists and scholars (Susanti & Fadriati, 2024; Wahono & Fuadah, 2021). ” It is hoped that these efforts will generate a category of Muslims who are not only intellectually superior but are also, morally, rock solid.

A pertinent example from Indonesia is MAN Insan Cendekia Tanah Laut, a boarding madrasah that integrates science and religion as part of its core curriculum. This institution employs a multidisciplinary approach linking scientific theories with Islamic teachings from the Quran and Hadith, fostering critical thinking aligned with religious values. This model has been institutionalized within the curriculum and co-curricular activities, demonstrating the feasibility and effectiveness of integration in formal Islamic education (Riwanda, 2024).

In Malaysia, the I-STEM paradigm incorporates Islamic principles such as tauhid (the oneness of God) into STEM education, enhancing students' understanding of the universe as signs of God (Ayat Kauniyah) and framing STEM learning as both a worship act and exploration of creation. Despite challenges like cultural resistance and pedagogical gaps, initiatives including teacher training and contextual teaching materials have promoted this model's implementation, contributing to character building and social ethics in Islamic education settings (Aksan, 2023).

Similarly, in Turkey, Imam Hatip Schools have adopted integrated curricula where Islamic religious education aligns with general sciences under a unified educational policy. This approach has successfully diminished the dichotomy between religion and science, reinforcing socio-cultural identity while driving academic progress (Hidayaturrahman, 2024).

However, challenges remain, including a shortage of teachers proficient in both scientific and religious disciplines, limited infrastructure, and systemic divides between general and religious sciences in educational systems. Proposed solutions include enhancing teacher competencies

through continuous professional development, designing interdisciplinary curricula, adopting technologically equipped religious laboratories, and fostering academic dialogues between scholars and scientists (Darsyah, 2023; Sagita et al., 2024; Susanti & Fadriati, 2024; Wahono & Fuadah, 2021).

Research Method

The research method in this study is library research, which is research conducted by examining magazines, books, journals or other data in the library. This research activity is carried out by collecting data from various internet, both from libraries and other sources. The data analysis used is a descriptive method that describes the findings of various books, journals, magazines, and literature related to the problems studied which are sourced from print and online editions.

Result and Discussion

A. The Concept of Science Integration in Islamic View

According to KBBI, integration refers to the process of uniting elements into a unified and integrated whole. The term "integration" comes from the English word "to integrate", which means "combine (something) so that it becomes fully a part of something else" or "mix or be together as onegroup" . This implies that integration involves combining different components or elements to form a single whole or a better version. Integration is also seen as a way to reconnect science with its original source, because religious science and science are essentially interrelated, not separate. This understanding is based on the belief that Allah SWT as the ultimate source of truth and knowledge, provides His wisdom both through revelation and nature. Revelation gave birth to religion and theology, while nature gave birth to science. So it can be understood that integration is a combination of science with religious knowledge so that it becomes a complementary unity.

Based on a philosophical perspective, science is something empirical, derived from experience and observation, easily verified, and based on statistical and quantitative techniques (K. M. Yusuf, 2021) . Islamic epistemology divides knowledge into two categories, namely: (Kurniasih et al., 2023) the first, knowledge based on human endeavour, and second, knowledge based on revelation or grace from Allah SWT. There are four classes of knowledge that come from human endeavours: senses and reason, as well as the heart. While inspiration and guidance are received by the human heart, and knowledge obtained from revelation or grace from Allah SWT is obtained by the Messengers. This shows that there are two types of knowledge in science: theology, or faith, which comes from the revelation of Allah SWT, and science, which is information obtained from human endeavour through observation and verification. However, theological understanding or faith comes from the revelation of Allah SWT. This understanding is in accordance with the opinion of Imam Al-Ghazali who distinguishes two categories of knowledge: worldly knowledge in the form of fardhu kifayah and knowledge of the hereafter or fardhu 'ain. So we can understand that knowledge is something that comes not only from the five senses

and reason but science also comes from the revelation of Allah swt al-Qur'an, and the words of the Prophet PBUH.

Mulyadhi interprets the integration of science as a process of aligning oneself with faith (tawhid). The focus of knowledge integration is not on knowledge itself but on the individual who seeks it. Once a person makes a decision, the value of the information is determined by the individual. Learners' understanding ensures that what they learn is in line with Islamic principles (Akbarizan, 2014) . Whereas Mahdi Ghulshani, integration of science involves interpreting Qur'anic verses in relation to modern science (Akbarizan, 2014) . The main objective is to highlight the miracle of the Qur'ān as the source of all knowledge and instil pride in Muslims for having a complete book. The belief that the Qur'ān serves as the source of all knowledge is not new; many prominent scholars from the past held this view. Among them is Imam al-Ghazali who in his book Ihya 'Ulum al-Din quotes Ibn Mas'ud stating that people who seek knowledge both ancient and modern should reflect on the Qur'an. In addition, he emphasised that all knowledge comes from the attributes of Allah, and the Qur'an explains His nature, attributes and actions. This knowledge has no limits, and the Qur'ān contains signs that connect it to science.

The aforementioned explanation suggests that the integration of science constitutes a complementary construction process, wherein science enhances religious knowledge (faith), and vice versa. Moreover, the combination of science and religion signals to scientists that science is not neutral or without value, but must also consider aspects of faith and morals. This ensures that the purpose of science as a blessing for all creation: *rahmatan lil 'alamin*, can be fully understood.

Concrete integration of science in an Islamic educational context often includes referencing specific verses of the Qur'an to explain natural phenomena, as shown in the following classroom practices:

Teaching Biological Phenomena with Qur'anic Verses:
When exploring the stages of human embryonic development, educators frequently use Surah Al-Mu'minun (23:12-14), which describes the creation of humans from clay and the successive stages in the womb. Modern embryology lessons can be intertwined with these verses to show harmony between scientific discovery and scriptural revelation.

Explaining Water Cycle Using Qur'an:
Lessons about the water cycle commonly integrate Surah Az-Zumar (39:21), which references rainfall, soil absorption, and plant growth, inviting students to observe natural processes and understand them as both scientific phenomena and signs of divine providence.

Student Integrative Projects:
Schools and institutions encourage student projects combining scientific experiment and Qur'anic study—for example, a project analyzing the properties of honey in light of Surah An-Nahl (16:68-69), which describes honeybee behavior and the healing properties of honey. Students are tasked

to review scientific research on honey while reflecting on the Qur'anic verses, synthesizing religious values with empirical analysis.

Astronomy and Celestial Order:

Astronomy modules regularly highlight Qur'anic verses such as Surah Al-Anbiya (21:33), which describes the orbits of celestial bodies, reinforcing the alignment between cosmological studies and Qur'anic cosmology.

B. The Relationship between Science and Islam

Science is knowledge associated with physical phenomena through investigation, experience, and the creation of hypotheses that can lead to the formation of a logical system of thought (Ihsan et al., 2021) . The above definition mentions some interesting facts, in particular: Firstly, science is limited to knowledge about physical objects. Secondly, science can only accept two sensations and reason is the source of knowledge.

Islam is a religion revealed by Allah SWT, the bearer of salvation and blessings for all creatures, delivered through the Prophet Muhammad SAW, with the Qur'an as a guide to life (Koehrsen, 2021) . Islam not only regulates personal affairs or worship, but is also a comprehensive guide to life. It provides a worldview and life guide that addresses all aspects of existence (Abdullah, 2022) . Therefore, Islam offers solutions to all the challenges of mankind. The Qur'an, as a source of knowledge and spiritual insight, plays a central role in life.

The relationship between science and Islam can be observed from two benchmarks. Firstly, do Islamic concepts foster faith and rationality, or do scientific ideas contradict religion? The second explores how Islam and science influence each other in human life. Both religion and science offer advantages: science provides tools and accelerates progress, while religion determines the purpose and direction of human endeavour. Science produces external (material) revolutions, while religion causes internal (spiritual) revolutions. Science enhances the intellect and mind, while religion enhances the soul and emotions. Science protects humans from physical threats such as diseases, floods and natural disasters, while religion protects humans from inner turmoil, anxiety and discomfort. In essence, science harmonises the outside world with humanity, while religion brings harmony within the individual (Sari & Setiadi, 2020) .

In the Islamic perspective related to science, Muslims are encouraged to use all their intellectual abilities and engage in critical thinking about everything found in nature (Irawan et al., 2022) . This is reflected in the Qur'anic verse surah Ar-Rahman verse 33.

This verse shows how Allah SWT gave humans the ability to contemplate and explore the universe using their intellect. Space exploration in Islam is seen as part of worship that aims to advance the survival of mankind, not just to learn the mysteries of the universe.

Muhammad Ismail states that understanding Islam involves thoughts that have real implications, which can be

understood logically as long as they are within the limits of reason. If concepts go beyond the reach of reason, then they must be demonstrated through sensory experience, leaving no room for doubt (Tamlekha, 2023). Therefore, reason plays an important and fundamental role for humans, as it enables them to determine what is best for the world and its future. The Prophet Muhammad (SAW) emphasised that there is no religion (Islam) without the use of reason, which implies that a Muslim's beliefs should be rooted in rational thought and understanding, rather than simply accepting dogma or information without evidence. However, it is important that reason is applied correctly.

Integration is the process of bringing together, integrating and blending all aspects of one's inner state, including those that are open, dialogical, honest, truthful and whole. Meanwhile, the terms "science" in the Islamic tradition and "science" in general can be used to define science (Meliani et al., 2021) . According to the Islamic tradition, science is the study of things as they are. Allah SWT's knowledge revealed in the Qur'an and Sunnah is represented by Qauliyah verses. As Allah SWT says in the Qur'an surah Asy-Syura verse 5.

While the knowledge of Allah SWT in the form of the universe and all its laws are referred to as kauniyah verses, as Allah SWT says in the Qur'an surah Ar-Ra'd verses 3-4.

Based on these two verses, all Islamic educational institutions should be built to teach science and technology as well as knowledge about the realm of worldly muamalah which is a subfield of kauniyah science. So that Muslims are not only taught the science of qauliyah, namely the science that studies the branches of the Qur'an and as-Sunnah related to the sciences of aqidah, morals, and worship. That way, Muslims not only master religious knowledge but are also equipped with general sciences.

Science is a fundamental aspect of the Qur'an (Zulfis, 2019) . The term 'ilm (knowledge) is mentioned 105 times, but with its derivatives, this term appears more than 744 times, which underlines the importance of this term in Islam. Quraish Shihab, in his book "Wawasan Al-Qur'an", notes that the word 'ilm appears 854 times in the Qur'an, referring to the process of acquiring knowledge (Ruhiyat, 2023) . This reflects the important role of science in Islam, as Muslims rely on it to determine the right time and place for worship, such as prayer, the beginning of Ramadan, and performing the Hajj. For example, astronomy is essential for determining the correct time. Other Islamic practices, such as Hajj and da'wah, are closely related to science and technology, requiring equipment and transport. Allah has provided the foundation of science in the Quran, leaving it to human beings to explore, develop and build on these concepts.

Real-world applications of this relationship are evident in Islamic practices such as determining prayer times through astronomy. The positions of the sun and moon are observed astronomically to accurately calculate the times for the five daily prayers, beginning

of Ramadan, and the Hajj pilgrimage, illustrating how scientific knowledge directly supports religious obligations (Bahri, 2025; Rojak, 2024). Beyond astronomy, the integration of science and Islamic ethics is fostering holistic student education, emphasizing critical thinking and moral development in science learning, especially in madrasahs and Islamic educational institutions (Purwaningatmaja, 2024; Solihah, 2025).

Furthermore, religious laboratory activities in Islamic education exemplify how experimental and practical scientific inquiry are encouraged within Islamic frameworks. These activities facilitate the modernization of religious education and the practical application of scientific knowledge while maintaining ethical and spiritual values (UIN Malang, 2025; Jurnal ICESHA, 2025). Historically, Muslim scholars combined rigorous scientific experimentation with religious directives, laying the foundations for the empirical sciences (SBASSE, 2023).

The Qur'an is not a science textbook, but it covers all knowledge related to science. It explicitly discusses everything that exists and happens on Earth, which can then be validated by science. The relationship between religion and social life concerns two closely related but distinct aspects, the influence of religious ideals and ethics, as well as the impact of religion on individuals from different social classes and groups, including customs and practices influenced by various religious elements (Lestariono et al., 2023) . In addition, the organisation and functioning of religious institutions are also relevant, indicating that religion and society reflect a collective expression of human values, which provides a comprehensive framework for individual behaviour on how to live rooted in belief and adherence to their religion. Islam operates as a system that encompasses both individuals and society, incorporating religious emotions, beliefs about ideology, rituals, and the social unity of those bound by its beliefs.

C. Importance of Integration

The integration of science and Islam is very important for several reasons: (Akhsan et al., 2021)

Science, if guided by the principles of faith and piety, can contribute greatly to human welfare. Without these principles, science becomes just a method with no meaningful impact on life.

Science is the foundation of modernism that introduced secular and hedonistic lifestyles. Without the inculcation of faith and piety, such a lifestyle can lead to fatalistic living.

If there is a gap between science and religion, then life becomes unbalanced and one-sided, contrary to the wisdom of Allah who has created man as a unity of body and soul, material and spiritual dimensions.

Science is a solid foundation for achieving worldly happiness. Without it, the development of worldly knowledge will be difficult to achieve.

In addition, there are several factors that make the integration of Islam and science important to pursue, namely as follows:

(Chanifudin & Nuriyati, 2020)

First, Muslims need a scientific system that can fulfil their material and spiritual needs. However, the current scientific system has not been able to fulfil these needs. This is due to the influence of Western values in modern science, which often contradict Islamic principles.

Secondly, from a sociological point of view, Muslims who live in areas with different cultural traditions from the West, where modern science has developed, certainly need a unique scientific system. This is because Western science was developed to fulfil the needs and interests of its own society.

Thirdly, Muslims used to have an advanced Islamic civilisation in the era of science based on their needs and beliefs. Several factors further highlight the importance of integrating Islam and science (Chanifudin & Nuriyati, 2020):

- Muslims need a scientific system that fulfils both material and spiritual needs. However, the current scientific system often fails to meet these needs due to the influence of Western values, which sometimes contradict Islamic principles.
- Sociologically, Muslims living in regions with cultural traditions different from the West require a unique scientific system. Western science was developed to meet the needs and interests of its own society, not necessarily those of Muslim communities.
- Historically, Muslims had an advanced Islamic civilization in the era of science, shaped by their own needs and beliefs.

Islam has long discussed the importance of science and its theories based on the Quran and the Prophet's sunnah, which states that science is not just a human invention. Islam being the only religion that has survived from the beginning, and as indicated in the Qur'an, this means that all people are obliged to learn to read in the sense of acquiring knowledge, perceiving, observing, comparing, analysing and drawing conclusions. Islam is a means for man to achieve his nature as a servant of Allah, leading him to the straight path as revealed by Allah in the Qur'an, namely ihdinaa al-shirat al-mustaqim.

Islam teaches that through religion, human life becomes harmonised, enabling them to reach their ultimate goal of paradise. Meanwhile, science is a tool for humans to more easily and quickly achieve religious goals. Islam views science as a means to accelerate religious goals, as shown by advances in fields such as natural science (Sihabussalam, 2020) . For example, foetal ultrasound in medicine, mobile phones in communications, and motorcycles in transport technology all illustrate how religious goals can be achieved more efficiently. The fundamental purpose of religion is to provide well-being and security for its followers, including in Islam, and through obedience to God and the responsible use of science, humans will lead a good life.

- Islam teaches that religion harmonizes human life, enabling individuals to reach their ultimate goal of paradise. Science, in turn, is a tool that helps humans achieve religious goals more efficiently. For example, advances in natural science have enabled foetal ultrasound in medicine, mobile phones

in communications, and motorcycles in transport technology, all of which illustrate how religious goals can be achieved more efficiently (Sihabussalam, 2020).

Practical Applications

- Learning Modules: Schools can develop integrated learning modules that combine biology with Islamic values, such as teaching about the human body while discussing the Qur'anic concept of the soul and the importance of health as a form of worship.
- Cross-Disciplinary Teacher Workshops: Workshops can be organized for teachers from science and religious studies backgrounds to collaborate on curriculum development, ensuring that scientific content is presented in alignment with Islamic principles.
- Religious Laboratories: Schools can establish religious laboratories where students conduct experiments that demonstrate scientific concepts while reflecting on their spiritual significance, such as studying the water cycle and discussing the Qur'anic verses about rain and sustenance.

D. Problems and Solutions for the Integration of Science and Islam

1. Problems of Integrating Science and Islam

Efforts to integrate science with Islam are essentially the goal of the integration of Islam and Science, namely to harmonise Islam and science to achieve ease in carrying out the commands of Allah SWT. and achieve happiness in the world and the hereafter. But in practice, the implementation in the field still faces many challenges or obstacles in the integration process. These problems must be recognised and overcome in order to find quick solutions to any problems that arise during the implementation of the integration process between Islam and science. Here are some of the problems faced in implementing the integration of Islam and science, namely: (Sagita et al., 2024)

First, the teaching of modern science and knowledge tends to focus only on the transfer of information, without fostering dialogue or integrating it with Islamic theological concepts, such as those found in tafsir, fiqh, hadith, and other Islamic disciplines. This has led to little difference between the way science is taught in Madrasahs and in regular schools. Therefore, science teaching and research needs to incorporate spiritual, ethical and theological values as essential and integrated components.

Secondly, one of the obstacles in the process of integrating science and Islamic Religion is the educational background of teachers. Educators trained in science find it difficult to integrate religious beliefs and philosophies into science teaching. Teachers with a religious education background also find it difficult to integrate Islam with science. Their ability to integrate scientific discoveries with Islamic studies is limited. Science tends to prioritise research with an observational, exact, measurable and analytical approach. Religion, on the other hand, emphasises understanding, faith and metaphysical concepts through interpretative and philosophical methods. The gap in both

subject matter and approach often makes it difficult for science teachers to philosophically convey the integration of science and religion. Similarly, religious teachers struggle to interpret religious concepts through the lens of scientific discourse (Darsyah, 2023) . In addition, many Islamic Religious Education teachers are still struggling to write Qur'anic verses accurately, read Qur'anic verses correctly and in accordance with the science of tajweed, answer basic fiqh questions that arise in society, not to mention the lack of mastery of Islamic science, history and other subjects, let alone interdisciplinary material. The solution to overcome this is to improve the quality of teachers by reading a lot, looking for information to increase the insight and knowledge of a teacher. So that teachers are not fixated on one field of science they master but are able to understand other fields of science.

Third, the lack of religious facilities, infrastructure and reference materials, especially those that intersect with science, hinders the effectiveness of learning management. Religious education is often considered important but receives less attention in terms of resources. Many schools and madrasahs face financial constraints that prevent them from acquiring adequate equipment and infrastructure (Darsyah, 2023) . In addition, many Islamic religious subjects require scientific analysis and validation, but the absence of experts and adequate equipment results in the content being delivered in a dogmatic manner without empirical exploration.

Fourth, the integration of science in Islamic learning is still lacking in some systems, approaches, tactics, and methods. It cannot be denied that a closer examination of the existing system so far shows that Islamic education in particular seems to be divided between the affairs of this world and the hereafter. There is a gap between the two, and as a result, Muslims who adhere to the wrong paradigm tend to be less actively involved in non-religious activities. The dichotomy between science and religious sciences still plagues the Indonesian education system today, giving rise to two extreme camps of human beings: the camp of human beings produced by the religious education system that is mainly concerned with fiqh and halal haram, and is not so concerned with the progress of scientific development on the contrary, those produced by the other system are mainly concerned with the progress and development of science, but are getting away from God.

Fifth, there is a dichotomy of science and religion in Indonesian education, giving birth to two extreme types of people: those who only consider fiqh and halal haram and do not care about the progress of material development, and those who only focus on progress and material development but are getting away from God. Until now, the direction of growth of science and religion, especially Islam, in many universities still feels fragmented and incomplete. Even today, talk of science is artificially supplemented with religion and Islam as scientific paradigms. Its existence only supports scientific ideas; it has not developed into a comprehensive scientific paradigm that requires scientific

elaboration in accordance with accepted scientific principles.

Sixth, Islamic religious education does not have a laboratory. If schools have laboratories for physics, biology, and language learning, then ideally schools also need and support laboratories that allow students to explore faith, as well as other general education programmes that require laboratories and equipment (Susanti & Fadriati, 2024) .

Impact on Student Competencies

Research at MTsN 1 Kota Palu demonstrates that integrating Islamic education with science significantly improves students' cognitive, affective, and psychomotor competencies. The integration encourages critical thinking, spiritual awareness, and holistic character formation. The cooperation of school policies, teachers, and curriculum design contributes to educational success aligned with 21st-century learning challenges, preparing students to be knowledgeable, ethical, and spiritually grounded (Rusdiana, 2025;).

Solutions in Overcoming the Problems of Integrating Science and Islam

First, based on 41 سورة هود الآية (Surah Hud verse 41), science teaching should integrate Islamic spiritual, ethical, and theological values by including Islamic disciplines such as tafsir, fiqh, and hadith. This holistic approach connects scientific discoveries with Qur'anic knowledge.

Second, referencing سورة النحل الآية 43 (Surah An-Nahl verse 43), teacher competency should be enhanced through training to deepen understanding in both science and Islam. Interdisciplinary curriculum development and increased teacher competence are critical.

Third, inspired by سورة النحل الآيات 68-69 (Surah An-Nahl verses 68-69), efforts should focus on providing adequate facilities and laboratories that support integrative learning. Collaboration between government and educational institutions is essential to secure funding.

Fourth, as guided by سورة النحل الآية 125 (Surah An-Nahl verse 125), education systems should adopt integrative methods that unify knowledge of the world and hereafter, linking spiritual teachings with scientific understanding through practical examples.

Fifth, from سورة البقرة الآية 164 (Surah Al-Baqarah verse 164), implementing a comprehensive paradigm where science is integrated with religion from an Islamic perspective eliminates extremism and fragmentation. Academic dialogue across disciplines is encouraged.

Sixth, establishing religious laboratories equipped for faith exploration and practical Islamic education is necessary. These support experiential learning, similar to traditional science laboratories (Romadona et al., 2022; Wahono & Fuadah, 2021).

2. Solutions in Overcoming the Problems of Integrating Science and Islam

First, the solution that researchers can do to science teaching that is not integrated with Islamic values is based on the words of Allah SWT in surah Hud verse 41, which reads: And [Noah] said, "Embark therein; in the name of Allah is its course and its anchorage. Indeed, my Lord is Forgiving and Merciful."

Based on this verse, we can understand that:

a. In fact, science teaching must integrate Islamic spiritual, ethical and theological values in an integrated manner and this can be done by including elements of religious disciplines such as tafsir, fiqh, hadith in science learning because many discoveries in science come from the study of religious sciences. For example, how ships can sail in the middle of the ocean has existed long before scientists found the concept of theory, Allah SWT has provided information about it.
b. By implementing a holistic learning approach that correlates science with religious teachings that can be done by implementing an integration-based curriculum between science and religion.

Second, the solution that can be done in overcoming the gap in the educational background of teachers in teaching science and religion, namely by looking at the words of Allah SWT in surah An-Nahl verse 43, which reads: And We sent not before you except men to whom We revealed [Our message]. So ask the people of the message if you do not know.

Based on the above verse, the solution provided by the Qur'an is:

a. Increase the intensity of training, seminars, webinars, or workshops for science teachers to understand Islamic concepts and vice versa training for religious teachers to learn basic science so that they can complement each other in the teaching process.
b. By conducting interdisciplinary curriculum development that integrates or combines science and religion philosophically and increases teacher competence in these two fields.

Third, the solution in overcoming the lack of adequate facilities and infrastructure and reference materials, namely based on the words of Allah SWT in surah An-Nahl verses 68-69, where God's creatures even animals can be used as learning tools/media. This is explained in the Qur'an.

Based on this verse, the solutions that we can do are:

a. Strive for the availability of adequate facilities and infrastructure in schools or madrasah, especially those related to learning that combines religion and science.
b. The government and educational institutions increase cooperation to allocate sufficient budget to improve the quality of laboratories and reference materials for integrative teaching.

Fourth, the solution in overcoming the problem of separate learning approaches and methods between the science of the world and the science of the hereafter, which is found in surah an-Nahl verse 125.

Based on the above verse, Allah explains to us to apply good learning approaches and methods. In addition, the solutions that can be done are:

a. Develop an education system that unites the knowledge of the world and the hereafter through integrative methods (Sutiono & Ridho, 2023) , so that students can know and understand

general science and religious science coherently.
b. Religious teaching should link spiritual teachings with scientific knowledge, for example through case studies that show the relationship between science and religious teachings in everyday life.

Fifth, the solution to overcoming the problem of the dichotomy of science and religion in the education system that causes extremism is found in the words of Allah SWT in surah Al-Baqarah verse 164 about how Allah supports the advancement of science and does not dichotomise science and religion.

Based on the verse above, the solution that we can do is:
a. Implementing a comprehensive educational paradigm where science is not only seen as something independent of religion, but integrated in an Islamic perspective that encourages students to see material and spiritual development as the ingredients of a unity.
b. There is a need for interdisciplinary dialogue and an academic environment to eliminate the fragmentation between religion and science. This discussion can take the form of seminars, workshops, or public lectures involving experts from both fields.

Sixth, the solution in overcoming the problem of the absence of a laboratory for Islamic Religious Education, namely:
a. Establishing religious laboratories in schools or madrasahs equipped with supporting facilities and experiments and faith studies, similar to physics or biology laboratories (Romadona et al., 2022; Wahono & Fuadah, 2021) .
b. The utilisation of this laboratory can be used for simulation activities such as worship practices, learning Islamic history through multimedia technology, and discussing Islamic studies that combine religion and science.

Conclusion

The integration of science is a complementary construction process, where science serves to complement theological knowledge (faith), and vice versa. Moreover, the combination of science and faith signals to scientists that science is not neutral or without value, but must also consider aspects of faith and morals.

The relationship between Islam and science is that science provides the tools and accelerates progress, while religion determines the purpose and direction of human endeavour. Science produces external (material) revolutions, while religion causes internal (spiritual) revolutions. Science elevates the mind and intellect, while religion elevates the soul and emotions. Science protects humans from physical threats such as floods, disease outbreaks and natural disasters, whereas religion protects humans from inner turmoil, anxiety and discomfort. In essence, science harmonises the external world with humanity, while religion brings harmony within the individual.

The importance of integration is due to the fact that Muslims need a scientific system that can fulfil their spiritual and material needs, which the current scientific system is unable to do. Then, if there is a gap between science and Islam, life becomes unbalanced and one-sided, contrary to the wisdom of Allah who has

created humans as a unity of body and soul, material and spiritual dimensions.

Problems in the integration of science and Islam include: first, science teaching that is not integrated with Islamic values. Second, the gap in the educational background of teachers in teaching science and religion. Third, the lack of adequate facilities and infrastructure and reference materials. Fourth, learning approaches and methods that separate the science of the world and the science of the hereafter. Fifth, the dichotomy of science and religion in the education system which leads to extremism. Sixth, the absence of a laboratory for Islamic Religious Education. The solutions that can be applied are: First, it is found in surah Hud verse 41. Second, it is found in surah an-Nahl verse 43. Third, it is found in surah an-Nahl verses 68-69. Fourth, it is found in surah an-Nahl verse 125. Fifth, it is found in surah al-Baqarah verse 164. Sixth, by building religious laboratories in schools for simulation activities of worship practices, as well as learning history and discussing Islamic studies that combine science and Islam.

Concrete solutions can be drawn from the Qur'an, such as guidance for practical implementation and values integration (for example, utilizing Surah Hud: 41, Surah an-Nahl: 43, 68–69, 125, and al-Baqarah: 164 to design curriculum and learning materials). Integration should also be supported by creating campus cultures that combine academic excellence with religious character, such as scheduling short sermon sessions and fostering habits that reflect Islamic teachings in everyday academic life.

By implementing these recommendations, stakeholders can advance holistic education that unites material and spiritual dimensions in the development of students, schools, and educators.

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