

Strengthening Islamic Education in the Era of Global Disruption: Integrating Science, Religion, and Pedagogical Innovation at Al-Ittifaqiah Indralaya Islamic Boarding School

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Abstract

This research is motivated by the challenges of globalisation, technological developments, and the dichotomy between religious studies and science that still influences Islamic education practices. This study is important to show how Islamic boarding schools respond to these challenges while maintaining their Islamic identity. This study aims to analyse strategies for strengthening Islamic education in an era of global disruption through the integration of science, religion, and pedagogical innovation at the Al-Ittifaqiah Indralaya Islamic boarding school. This study examines efforts to strengthen Islamic education amid globalization, technological change, and the persistent dichotomy between religious and scientific knowledge through a case study of Al-Ittifaqiah Islamic Boarding School, Indralaya. Using a qualitative case study approach, data were collected through interviews, observations, and document analysis, and analyzed thematically. The findings show that the pesantren has sought to integrate science and religion through value-based learning, scientific ethics, and pedagogical innovation, contributing to character development and learning relevance. However, the implementation process continues to face practical challenges, particularly limitations in the formal curriculum and educators' digital literacy, which constrain the effectiveness of integration efforts. While the findings are

limited to a single institutional context, the study provides insights into both the opportunities and obstacles involved in developing a more adaptive and integrative model of Islamic education in the era of global disruption.

Keywords: *Islamic education, integration of science and religion, pedagogical innovation, Islamic boarding schools, global disruption*

A. Introduction

The rapid advancement of digital technology, information globalization, and socio-economic transformation has created an era of global disruption that significantly affects educational systems worldwide. Educational institutions are increasingly expected to prepare learners who are not only intellectually competent and adaptable but also grounded in strong ethical and moral values. For Islamic education, this challenge is particularly significant because it requires balancing the preservation of Islamic identity with the need to equip students with scientific knowledge, technological competence, and twenty-first-century skills.¹

In this context, Islamic education faces multidimensional challenges. On the one hand, Islamic education is required to maintain Islamic values that form its identity and spirit; on the other hand, it must be able to respond to global demands that emphasise mastery of science, technology, and 21st-century skills. Islamic education normatively has a mission to shape insan kāmīl, or humans who develop in a balanced manner between the spiritual, intellectual, and social dimensions.² However, in practice, many Islamic educational institutions, including Islamic boarding schools, still face the problem of a dichotomy between religious studies and general studies (science), with the result that the educational process is fragmented and lacks integration³. In fact, in Islamic epistemology, knowledge does not recognise a separation between the religious and the empirical. The principle of tawhīd affirms that all knowledge comes from Allah SWT and must be directed towards the benefit of humanity⁴. On this basis, contemporary Islamic educational thinkers have proposed the idea of integrating knowledge as a response to the epistemological crisis in modern education. Isma'il Raji al-Faruqi, for example, through his concept of Islamisation of Knowledge, emphasises the need to reconstruct modern sciences so that they are in harmony with Islamic values and worldview⁵. Meanwhile, Syed Muhammad Naquib al-Attas emphasised that the main objective of Islamic education is the formation of civilised human beings (the good man), which can only be achieved through the integration of knowledge, morals and spirituality⁶.

¹ Dr Khandakar Akhter Hossain, *EVALUATION OF ETHICAL VALUES TO DEVELOP GLOBAL HUMAN RESOURCE*, 2023.

² Abdullah Sahin, "Critical Issues in Islamic Education Studies: Rethinking Islamic and Western Liberal Secular Values of Education," *Religions* 9, no. 11 (2018): 335, <https://doi.org/10.3390/rel9110335>.

³ Fatimah Depi Susanty Harahap et al., "Integrasi Sains dan Islam dalam Pendidikan Islam: Model, Tantangan, dan Implementasi di Madrasah dan Pesantren," *Kutubkhanah* 25, no. 1 (2025): 1, <https://doi.org/10.24014/kutubkhanah.v25i1.36861>.

⁴ Muhammad Feri Fernadi, *DISCOURSE OF CONTEMPORARY ISLAMIC EDUCATION: DICHOTOMY, ISLAMIZATION, AND INTEGRATION OF SCIENCE*, n.d.

⁵ Shafa Kamalia, "Konsep Islamisasi Ilmu Menurut Pemikiran Syed Naquib Al-Attas Dan Ismail Raji al-Faruqi," *IHSAN: Jurnal Pendidikan Islam* 3, no. 4 (2025): 895-910, <https://doi.org/10.61104/ihsan.v3i4.2109>.

⁶ Muhammad Naquib Al-Attas, *The Concept of Education in Islam* (Muslim Youth Movement of Malaysia Kuala Lumpur, 1980), https://www.academia.edu/download/53532036/attas-concept_of_edu_in_islam_text-final.pdf.

In Indonesia, Islamic boarding schools are the oldest Islamic educational institutions and play a strategic role in shaping the Islamic character of society. In addition to being centres for the transmission of classical Islamic knowledge, Islamic boarding schools also function as agents of social and cultural change⁷. However, in this era of global disruption, Islamic boarding schools are faced with the demand to reform their education systems in order to remain relevant to the times. The integration of science and religion into the pesantren curriculum is a necessity, not only to increase the competitiveness of graduates, but also to ensure that the mastery of modern knowledge remains within the framework of Islamic values⁸.

In addition to the curriculum, pedagogical innovation is an important element in strengthening Islamic education. Traditional teacher-centred learning patterns that emphasise memorisation need to be complemented with a more participatory, critical and contextual approach to learning. Pedagogical innovations such as student-centred learning, problem-based learning, and the use of digital technology can encourage students to develop their reasoning, creativity, and problem-solving skills, without neglecting the formation of good character⁹. A number of studies show that pedagogical innovation in Islamic education contributes positively to the quality of learning and character building of students¹⁰.

Therefore, Al-Ittifaqiah Indralaya Islamic Boarding School provides an important case for exploring how science, religion, and pedagogical innovation can be integrated within Islamic education. This study seeks to answer the following research questions: How is the integration of science and religion implemented at Al-Ittifaqiah Islamic Boarding School? What forms of pedagogical innovation support this integration? and What challenges and opportunities arise in strengthening Islamic education in the era of global disruption? Accordingly, the objective of this study is to analyse strategies for strengthening Islamic education through the integration of science, religion, and pedagogical innovation, while critically examining the practical constraints encountered in their implementation.

Strengthening Islamic education in the context of this article refers to systematic efforts to enhance the quality, relevance, and adaptability of the Islamic education system to the challenges of the modern era, particularly in an era of global disruption characterised by technological advances, digitalisation, and rapid social change. Islamic education does not only refer to the teaching of religious sciences, but also to the development of critical thinking skills, scientific literacy, and 21st-century competencies based on Islamic values.

The integration of science and religion here refers to the process of unifying or harmonising empirical sciences (such as physics, biology, mathematics) and religious studies within a coherent, complementary, and non-dichotomous educational framework. This

⁷ Choirun Niswah et al., "Analisis Peran Lembaga Pendidikan Pesantren Dalam Membangun Karakter dan Ilmu Pengetahuan," *Jurnal Ilmiah Multidisipin* 3, no. 6 (2025): 308-16, <https://doi.org/10.60126/jim.v3i6.984>.

⁸ Tsalis Imamuddin, "Transformasi Kurikulum Pesantren: Studi Literatur Tentang Pengembangan Pendidikan Islam Berbasis Kebutuhan Zaman," *Tarbiyah Islamiah: Jurnal Inovasi Pendidikan Islam* 1, no. 1 (2025): 1-10, <https://doi.org/10.52615/tjipi.v1i1.8>.

⁹ Dr Rasa Braslauskienė, *Innovation-Based and Student-Centred Teaching in Higher Education Institution*, n.d.

¹⁰ Hasmiza Hasmiza, "MODEL KURIKULUM PENDIDIKAN ISLAM DI ERA DIGITAL: MENGOPTIMALKAN TEKNOLOGI UNTUK PEMBELAJARAN YANG INOVATIF," *Research and Development Journal of Education* 11, no. 1 (2025): 164, <https://doi.org/10.30998/rdje.v11i1.28068>.

integration is based on the premise that the separation of religious studies and science creates an epistemological gap that limits students' potential to understand the reality of life in its entirety¹¹.

Pedagogical innovation refers to learning approaches and instructional strategies that are adaptive to the needs of the times, such as project-based learning, collaborative learning, the use of digital technology, and the integration of 21st-century skills. This innovation aims to ensure that the learning process not only instils narrative knowledge, but also higher-order thinking skills (critical thinking), problem-solving, and digital literacy that are relevant to global challenges¹².

Several studies confirm that the dichotomy between religious studies and science is one of the main issues hindering the effectiveness of traditional Islamic education. The integrative paradigm is seen as a model capable of bridging the two fields of study so that they can complement each other and enrich students' understanding¹³.

In the study of science integration, this process not only combines scientific content into religious education, but also builds connections between religious values and scientific thinking, so that students understand that the Qur'an and empirical science can support each other in understanding the reality of nature and life¹⁴.

Other studies show that the integration of science and Islam can support the improvement of graduates' competencies while strengthening their faith and morality, by connecting verses about the universe (kauniyah) and verses about revelation (kauliyah). the integration of Islamic Religious Education and science learning from the perspective of the Qur'an is important because through contemplating Allah's creation, students can increase their faith and scientific understanding¹⁵.

Allah Says in The Qur'an Surah Ali Imran 190

إِنَّ فِي خَلْقِ السَّمَوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ لآيَاتٍ لِّأُولِي الْأَلْبَابِ

Indeed, in the creation of the heavens and the earth and the alternation of the night and the day are signs for those of understanding

The digital era demands changes in learning strategies; it is no longer sufficient to rely solely on lectures or traditional memorisation. Pedagogical innovations that are responsive to the Society 5.0 era emphasise the integration of technology, ethics, and participatory learning approaches. Systematic research on digital Islamic education shows that improving digital literacy and teacher professionalism are key to pedagogical transformation, but also highlights ethical challenges and infrastructure readiness in Islamic education environments¹⁶.

¹¹ Muna Hajita, "PARADIGMA INTEGRASI AGAMA DAN SAINS DALAM PEMBELAJARAN PENDIDIKAN AGAMA ISLAM," *TA'LIM: Jurnal Studi Pendidikan Islam* 7, no. 2 (2024): 265–89, <https://doi.org/10.52166/talim.v7i2.6614>.

¹² Riries Ernie Cynthia and Hotmaulina Sihotang, "Melangkah Bersama Di Era Digital: Pentingnya Literasi Digital Untuk Meningkatkan Kemampuan Berpikir Kritis Dan Kemampuan Pemecahan Masalah Peserta Didik," *Jurnal Pendidikan Tambusai* 7, no. 3 (2023): 31712–23.

¹³ Suswanto et al., "UPAYA MENGHINDARI DIKOTOMI ILMU MELALUI INTEGRASI PENDIDIKAN ISLAM DALAM PENDIDIKAN NASIONAL," *An-Nahdlah: Jurnal Pendidikan Islam* 4, no. 3 (2025): 712–21, <https://doi.org/10.51806/an-nahdlah.v4i3.652>.

¹⁴ 'AbdulḤamīd AbūSulaymān and International Institute of Islamic Thought, eds., *Islamization of Knowledge: General Principles and Work Plan*, 2nd ed., rev.expanded, Islamization of Knowledge Series, no. 1 (International Institute of Islamic Thought, 1989).

¹⁵ Encep Solihutaufa, *FILSAFAT PENDIDIKAN ISLAM: Integrasi Ilmu dan Iman di Era Digital* (Goresan Pena, 2025).

¹⁶ Nurmita Sari et al., *Strategi Pembelajaran Mendalam* (Andi Kaharuddin, 2025).

Previous literature has focused on the integration of curriculum content or the use of educational technology separately. This article argues that the integration of science, religion, and pedagogical innovation should be viewed as a synergistic whole in building a strong Islamic education in an era of global disruption, rather than simply adding science to the curriculum or utilising technology partially. A somewhat controversial hypothesis here is that Islamic education that does not strategically integrate science, religious values, and learning innovation will become increasingly marginalised amid global demands. Some traditional views may reject strong integration with science on the grounds of preserving the purity of religious education, but this view is considered unresponsive to the needs of the times¹⁷.

This study concludes that strong Islamic education in an era of global disruption requires not only mastery of religious knowledge, but also scientific thinking and pedagogical innovation in line with Islamic values. The integrated integration of science, religion, and learning innovation produces graduates who are not only faithful and virtuous, but also scientifically competent and adaptable to global challenges¹⁸. The main objective of this article is to analyse the concept and urgency of strengthening Islamic education in an era of global disruption through the integration of science, religion, and pedagogical innovation, using the Al-Ittifaqiah Indralaya Islamic boarding school as a point of analysis. Academically, this article is expected to contribute to the enrichment of Islamic education knowledge, particularly in the discourse of science integration and pedagogical reform. Practically, this study is expected to serve as a reference for Islamic boarding school administrators and Islamic education policy makers in formulating education development strategies relevant to global challenges.

B. Methods

This study employed a qualitative case study design to gain an in-depth understanding of how Islamic education is strengthened through the integration of science, religion, and pedagogical innovation within the context of an Islamic boarding school holistically¹⁹.

Case studies were chosen because the research focused on one specific location that had distinctive characteristics relevant to the issue under investigation. The Al-Ittifaqiah Islamic boarding school was positioned as a single case that was analysed in depth to gain a comprehensive understanding of the practice of integrating Islamic education in an era of global disruption²⁰.

This research was conducted at Al-Ittifaqiah Islamic Boarding School in Indralaya, South Sumatra, as one of the Islamic educational institutions that manages formal and non-formal education based on Islamic boarding schools. This location was chosen because it has the potential for developing an integrated curriculum between religious and scientific knowledge and applying pedagogical innovations.

The research was conducted at Al-Ittifaqiah Islamic Boarding School, Indralaya, South Sumatra, which was selected because of its efforts to integrate religious and scientific knowledge within both formal and non-formal educational settings. Data were collected over a three-month period through semi-structured interviews, participatory observation, and document analysis.

¹⁷ AbūSulaymān and International Institute of Islamic Thought, *Islamization of Knowledge*.

¹⁸ Muhammad Latif Fauzi et al., *INOVASI KURIKULUM PENDIDIKAN ISLAM* (PT Arr Rad Pratama, 2025).

¹⁹ Hasan Syahrizal and M. Syahrani Jailani, "Jenis-Jenis Penelitian Dalam Penelitian Kuantitatif Dan Kualitatif," *QOSIM: Jurnal Pendidikan Sosial & Humaniora* 1, no. 1 (2023): 13–23, <https://doi.org/10.61104/jq.v1i1.49>.

²⁰ Ermi Rosmita et al., *Metode Penelitian Kualitatif* (CV. Gita Lentera, 2024).

Informants were selected Islamic boarding school leaders, Educational institution administrators (madrasah/school), Teachers (ustaz/ustazah) and students who were directly involved in curriculum implementation, teaching and learning activities, and educational innovation.²¹ The interview guidelines were developed based on a literature review of Islamic education, science integration, and pedagogical innovation²². Interviews explored participants' perspectives and experiences regarding the integration of science and religion, while observations focused on classroom interactions, learning processes, and pedagogical practices. Documentary sources, including curricula, syllabi, lesson plans, textbooks, and institutional policy documents, were analysed to support and verify findings from interviews and observations²³. The researcher served as the primary research instrument and was directly involved in data collection and interpretation while maintaining ethical and professional standards. Data were analysed thematically following the interactive model of Miles, Huberman, and Saldaña, involving data reduction, data display, and conclusion drawing conducted continuously throughout the research process²⁴. To enhance the credibility and trustworthiness of the findings, source and technique triangulation, member checking, and referential adequacy procedures were employed.

Semi-structured interviews were conducted with Islamic boarding school leaders, teachers, and education administrators to explore their views, policies, and practices regarding the integration of science and religion. Observations were conducted to directly observe the learning process, interactions between teachers and students, and the application of pedagogical innovations in the classroom. The observations were moderate and participatory in nature, with researchers involved to a limited extent without disrupting learning activities²⁵. These steps were taken to improve the credibility, transferability, and dependability of the research results²⁶.

C. Results and Discussion

1. Results

The interview findings indicate that teachers consciously integrate scientific concepts with Islamic values during classroom instruction. One biology teacher explained: "When discussing ecosystems and environmental conservation, I do not only explain the scientific concepts. I also invite students to reflect on Quranic teachings about human responsibility as khalifah on earth. This helps students understand that protecting the environment is not only a scientific obligation but also a religious responsibility."²⁷

Classroom observations supported this statement. During a lesson on environmental sustainability, students were asked to analyse local waste management problems and relate their findings to Islamic teachings on stewardship, cleanliness, and social responsibility.

Similarly, a mathematics teacher described how religious values were incorporated into abstract concepts: "In mathematics, we often discuss patterns, balance, and precision. I encourage students to see that the order and consistency found in mathematical principles reflect the

²¹ Bagus Sumargo, *TEKNIK SAMPLING* (UNJ PRESS, 2020).

²² Svend Brinkmann, *Qualitative Interviewing* (OUP USA, 2013).

²³ Asep Mulyana et al., *METODE PENELITIAN KUALITATIF* (Penerbit Widina, 2024).

²⁴ Ajat Rukajat, *Pendekatan Penelitian Kualitatif (Qualitative Research Approach)* (Deepublish, 2018).

²⁵ Koes Winarno, "MEMAHAMI ETNOGRAFI ALA SPRADLEY," *Jurnal SMART (Studi Masyarakat, Religi, dan Tradisi)* 1, no. 2 (2015), <https://doi.org/10.18784/smart.v1i2.256>.

²⁶ Riky Rizki Junaidi et al., *Buku Referensi Metodologi Penelitian* (PT. Sonpedia Publishing Indonesia, 2025).

²⁷ Interview with Ms Fenny Pratiwi Permatasari, S,Pd, M.SI, Gr, a biology teacher at Al Ittifaqiah Indralaya, 22 October 2025.

perfection of Allah's creation. The goal is not simply to insert religious messages but to help students appreciate the harmony between reason and faith."²⁸

A concrete example was observed during a lesson on geometric patterns, where students examined mathematical symmetry and subsequently discussed its manifestation in Islamic architecture and mosque design.

An information technology teacher emphasized the importance of ethical integration in digital learning: "We teach students how to use digital technology effectively, but we also discuss Islamic ethics in online communication. Students learn that technological skills must be accompanied by honesty, responsibility, and self-control when interacting on social media."²⁹

In one observed activity, students were assigned to evaluate examples of online content and identify which forms of digital behaviour were consistent with Islamic ethical principles. They then presented their analyses in groups and discussed the potential social consequences of misinformation and irresponsible online conduct.

The results of interviews with students indicate consistency with the findings reported by the Biology teacher regarding the effectiveness of integrating science, religion and pedagogical innovation into the learning process. The students stated that a learning approach which links scientific content with Islamic values makes it easier for them to understand the concepts being studied, whilst also boosting their motivation to learn.

One student said: "When studying Biology, the teacher often links the material to verses from the Qur'an or the greatness of Allah in the creation of living beings. In my opinion, this approach makes the lessons more interesting and easier to understand because we can see the connection between science and religion".³⁰

The results of the study show that Al-Ittifaqiah Indralaya Islamic Boarding School has made gradual efforts to integrate science and religion into its curriculum structure. This integration is evident in the combination of general subjects (such as mathematics, biology, and information technology) with Islamic values and perspectives. Teachers and boarding school administrators consciously link scientific concepts to verses from the Qur'an and the principle of tawhid in the learning process.

Empirically, this integration is not yet fully structural in nature, but remains predominantly at the pedagogical and contextual levels. Teachers often use reflective approaches, such as linking natural phenomena with concepts from the Quran, to instil spiritual awareness and scientific understanding in students³¹.

These findings indicate that Islamic boarding schools are in a transitional phase from a dichotomous education model to an integrative paradigm. The study found that pedagogical innovations at Al-Ittifaqiah Indralaya Islamic Boarding School began to develop in line with the demands of the era of global disruption. These innovations include the use of digital learning media, group discussions, project-based learning, and contextual assignments that encourage students to think critically and collaboratively.

Although traditional learning methods such as *bandongan* and *sorogan* are still maintained as characteristics of Islamic boarding schools, teachers have begun to combine them

²⁸ Interview with Ms Marhama, S,Pd, Gr, a mathematics teacher at Al Ittifaqiah Indralaya, 27 October 2025.

²⁹ Interview with Mr Ferry Heryadi, M.Pd, a information technology teacher at Al Ittifaqiah Indralaya, 4 November 2025.

³⁰ Interview with Khoirotun Hisan, a Student at Al Ittifaqiah Indralaya, 22 October 2025.

³¹ Encep Solihutaufa, *FILSAFAT PENDIDIKAN ISLAM: Integrasi Ilmu dan Iman di Era Digital* (Goresan Pena, 2025).

with a student-centred learning approach³². This shows a pedagogical awareness that innovation does not have to eliminate tradition, but rather enrich learning practices to make them more relevant to the needs of students in the digital age.

The head of Pondok Al Ittifaqiah stated that technology is an unavoidable necessity in today's educational landscape, but its use must remain under appropriate supervision and guidance. "Technology does indeed aid the learning process. Students can find information more quickly and teachers can deliver material more easily. However, if left unchecked, technology can also have a negative influence on students' behaviour. Therefore, we must guide them to use technology wisely; one way of doing this is by setting limits on mobile phone use and imposing disciplinary sanctions on those who break the rules"³³.

The findings of the researcher's observations also indicate that digital technology has become an integral part of students' learning activities. Some students were seen using laptops and digital devices to search for learning resources or complete tasks set by teachers. However, at certain times, the researchers also observed a tendency among some students to access social media for non-academic purposes when not under the direct supervision of teachers. This situation indicates that the use of digital technology presents both opportunities and challenges within the pesantren environment³⁴.

Furthermore, teachers identified the potential erosion of moral and religious values as one of the primary risks of digital technology development. In their view, increasingly open access to various digital platforms exposes students to information and content that does not always align with Islamic values and boarding school culture. This concern is not interpreted as a rejection of technology, but rather as a form of moral caution in the face of rapid social change.

The findings of the observations support this assertion. The researchers found that the pesantren sought to instil ethical values in the use of technology through teacher guidance, religious activities, and the cultivation of discipline in daily life. These various efforts were undertaken to ensure that the use of technology was not solely focused on academic aspects, but also remained consistent with the development of the students' character and Islamic values.

Based on the results of these interviews and observations, it can be concluded that teachers and boarding school leaders view global disruption as an opportunity to improve the quality of education, but at the same time are aware of the various risks that accompany it. Therefore, the integration of technology into learning is understood not merely as a pedagogical necessity, but also as a moral challenge that requires the strengthening of digital literacy, supervision, and continuous character building.

While the interview results generally indicate a positive perception of global disruption among pesantren leaders and teachers, a more nuanced analysis reveals the existence of significant concerns and challenges. Several teachers expressed ambivalent attitudes toward the rapid integration of digital technology into the educational process. Although they acknowledged its potential to improve access to knowledge, learning efficiency, and pedagogical innovation, they also perceived it as a source of new educational risks.

³² Sari et al., *Strategi Pembelajaran Mendalam*.

³³ Interview with KH Drs. Mudrik Qori, MA, The head of Pondok Al Ittifaqiah Indralaya, 29 October 2025.

³⁴ Observation of technology-based learning activities and student interaction at the Al-Ittifaqiah Islamic Boarding School in Indralaya, 29 October 2025.

The most frequently mentioned concern relates to the potential degradation of students' moral and religious values. Teachers reported that unrestricted access to digital platforms may expose students to content that contradicts Islamic teachings and pesantren values. In addition, the increasing dependence on smartphones and social media was perceived as reducing students' discipline, concentration, and engagement in traditional learning activities, including religious studies and face-to-face interactions within the pesantren community.

Some educators also felt threatened by the changing role of teachers in the digital era. The abundance of online information has challenged the traditional position of teachers as the primary source of knowledge. For several senior teachers, this transformation generated feelings of uncertainty regarding their professional authority and pedagogical relevance. Furthermore, limitations in digital literacy among some educators created additional barriers to the effective implementation of technology-based learning.

These findings suggest that global disruption is not experienced solely as an opportunity for educational reform but also as a complex process that generates tension between innovation and value preservation. Consequently, the adaptation of pesantren education requires not only technological integration but also institutional strategies to strengthen digital ethics, religious character formation, and teacher capacity development. Recognizing these challenges is essential to understanding the realities of educational transformation within Islamic boarding schools and avoids presenting disruption as an exclusively positive phenomenon.

This perception affects the speed and depth of pedagogical innovation implementation. Teachers who have digital literacy and integrative understanding tend to be more adaptive, while teachers with a traditional educational background tend to be more cautious. These findings emphasise the importance of strengthening the capacity of educators as the key to the success of pesantren education transformation.

From the perspective of santri, the integration of science, religion, and pedagogical innovation was reflected in several concrete learning practices observed during fieldwork. Interview data revealed that teachers frequently connected scientific concepts with Qur'anic verses and Islamic teachings during classroom instruction. For example, in biology lessons on ecosystems and living organisms, teachers encouraged students to reflect on the signs of God's creation (*ayat kauniyah*), while discussions on environmental conservation were linked to Islamic teachings regarding human responsibility as *khalifah* (stewards) on earth.

Santri reported that these learning practices made scientific knowledge more meaningful and easier to understand because they could relate abstract concepts to their religious beliefs and everyday experiences. One student explained that learning biology through references to Qur'anic teachings helped him appreciate the relationship between scientific inquiry and faith rather than viewing them as separate domains of knowledge.

Pedagogical innovation was also evident in the use of collaborative discussions, project-based learning, presentations, and digital learning media. During classroom observations, students were actively involved in group discussions analyzing contemporary issues such as environmental pollution, technological development, and ethical challenges in the digital era. In these activities, students were encouraged not only to identify scientific explanations but also to evaluate social and moral implications from an Islamic perspective.

The findings further indicate that santri developed reflective thinking skills through these learning experiences. Rather than accepting technological developments uncritically, students demonstrated an ability to consider both the benefits and potential ethical consequences of technology use. Several interviewees emphasized the importance of using digital technology

responsibly and avoiding online content that contradicts Islamic values. This suggests that the integration of science, religion, and pedagogical innovation contributes not only to cognitive understanding but also to the development of moral reasoning and ethical awareness.

Therefore, the fieldwork data indicate that the integration model implemented in the pesantren is operationalized through the contextualization of scientific content with Islamic values, active learning strategies, and reflective discussions on contemporary issues. These practices enable santri to construct knowledge in ways that simultaneously strengthen scientific understanding, religious commitment, and moral responsibility.

santri demonstrated an increase in reflective thinking skills and moral awareness in viewing the development of technology and science³⁵. These findings reinforce the argument that the integration of Islamic education not only has an impact on cognitive aspects, but also on the character building and moral integrity of santri.

This study identified several challenges in strengthening Islamic education that emerged directly from interviews with pesantren leaders and teachers and were corroborated by classroom observations. First, teachers reported differences in their ability to implement technology-based and student-centred learning approaches. While some teachers regularly utilized digital media, presentations, and collaborative learning activities, others continued to rely predominantly on lecture-based instruction and acknowledged limited confidence in using educational technologies.

Second, participants highlighted constraints related to technological infrastructure. Several teachers noted that access to digital devices and internet-based learning resources was not consistently available across learning contexts, limiting the broader implementation of pedagogical innovations.

Third, interviews revealed the absence of formal institutional guidelines governing the integration of scientific knowledge, Islamic values, and contemporary pedagogical approaches. As a result, teachers developed their own strategies for integrating religious and scientific perspectives, leading to variations in classroom practice. For example, some teachers explicitly linked scientific topics to Qur'anic verses and ethical discussions, whereas others focused primarily on subject content without a structured integration framework.

The fieldwork also revealed cultural tensions surrounding educational change. Several teachers expressed concerns that excessive reliance on digital technology might reduce students' engagement in traditional pesantren learning practices, including direct interaction with teachers, collective religious activities, and the cultivation of discipline through boarding-school routines. These concerns did not represent outright opposition to innovation; rather, they reflected efforts to balance educational modernization with the preservation of pesantren identity and values.

Despite these challenges, the fieldwork data indicate that Al-Ittifaqiah Indralaya Islamic Boarding School has initiated several concrete efforts to strengthen Islamic education. Classroom observations documented the integration of Islamic values into science instruction, the use of group discussions and project-based activities, and the incorporation of digital learning media in selected classes. Interviews with students further suggested that these practices increased learning motivation and encouraged them to reflect on scientific and technological developments from both academic and ethical perspectives.

³⁵ Solihutaufa, *FILSAFAT PENDIDIKAN ISLAM* (Goresan Pena, 2025).

Therefore, the findings do not suggest that the integration model has been implemented uniformly or without obstacles. Rather, they demonstrate an ongoing process of educational adaptation in which teachers and institutional leaders negotiate the relationship between scientific knowledge, religious values, technological change, and pesantren traditions. The significance of the case lies not in presenting a fully developed model of integration, but in illustrating how a pesantren is attempting to respond to the challenges of global disruption while maintaining its religious and educational identity.

Overall, the results of the study indicate that Al-Ittifaqiah Indralaya Islamic Boarding School has taken significant initial steps in strengthening Islamic education through the integration of science, religion, and pedagogical innovation. Although its implementation still faces various limitations, these findings confirm that Islamic boarding schools have great potential to become models of adaptive Islamic education in an era of global disruption.

2. Discussion

The findings of this study suggest that the urgency of strengthening Islamic education in the era of global disruption extends beyond curriculum reform or the addition of religious content. Rather, the challenge lies in how Islamic educational institutions respond to rapid technological, social, and epistemological changes while maintaining their religious identity. The case of Al-Ittifaqiah Indralaya demonstrates that the integration of science, religion, and pedagogical innovation is not a linear process of modernization but a complex negotiation between competing educational priorities.

Fieldwork data revealed that teachers and institutional leaders generally recognized the importance of integrating scientific knowledge with Islamic values. This awareness emerged from concerns that students must be equipped not only with religious literacy but also with the competencies required to navigate contemporary social and technological realities. However, the study also found that integration remained largely dependent on individual teacher initiatives rather than being systematically embedded within curriculum structures or institutional policies. This finding suggests that the primary challenge is not the acceptance of integration as an educational ideal, but the translation of that ideal into sustainable pedagogical and organizational practices.

From a broader theoretical perspective, these findings support arguments advanced by scholars of contemporary Islamic education who emphasize the need to overcome the historical dichotomy between religious and secular knowledge. However, the findings also reveal that the process of overcoming this dichotomy is often more complicated than theoretical models suggest. At Al-Ittifaqiah, integration was primarily expressed through contextual teaching practices, such as connecting scientific concepts to Qur'anic teachings and ethical discussions, rather than through the development of an integrated epistemological framework. This indicates that educational transformation within pesantren frequently begins at the classroom level before becoming institutionalized within curriculum and governance structures.

The findings also highlight tensions that are often overlooked in discussions of educational reform. While technological innovation was widely viewed as necessary, several teachers expressed concerns regarding its impact on students' discipline, moral development, and engagement with traditional pesantren learning practices. These concerns reflect a broader dilemma faced by many Islamic educational institutions: how to embrace innovation without weakening the cultural and spiritual traditions that constitute their identity. In this sense, resistance to change should not be interpreted merely as conservatism or opposition to

modernization. Rather, it can be understood as an effort to critically negotiate the boundaries between adaptation and preservation.

These findings resonate with studies by Imamuddin, which suggest that many pesantren remain in the early stages of knowledge integration. Similar patterns have also been identified in studies of Islamic educational reform that describe how institutional transformation is often constrained by curriculum structures, teacher preparedness, organizational culture, and resource limitations. At the same time, the present study extends previous research by demonstrating that integration is not solely an epistemological issue but also a pedagogical and cultural process involving ongoing negotiations among teachers, students, institutional leaders, and pesantren traditions.³⁶

Consequently, the significance of the Al-Ittifaqiah case does not lie in presenting a fully successful model of integrated Islamic education. Instead, its value lies in illustrating the realities, tensions, and limitations encountered during educational transformation. The findings suggest that strengthening Islamic education in the era of global disruption requires more than technological adoption or curriculum revision. It demands long-term institutional commitment, teacher professional development, clear integration frameworks, and continuous dialogue between innovation and tradition. Therefore, the future of Islamic education may depend not on choosing between religious authenticity and educational modernization, but on developing sustainable ways to reconcile both within changing social contexts.

This shows that knowledge integration is not an instant process, but rather a long-term transformation that requires epistemological readiness, curriculum, and human resources.

From a theoretical perspective, the findings of this study reinforce the view that Al-Faruqi who reject the dichotomy between religious studies and science. The integration carried out by Islamic boarding schools through linking verses from the Qur'an with scientific phenomena reflects the principle of tauhid al-'ilm (unity of knowledge), although it has not yet been fully institutionalised structurally in the formal curriculum³⁷. Thus, this study reinforces the argument that the integration of knowledge in Islamic education is more effective when it begins with pedagogical practices before being formalised in institutional policies.

However, some critical literature argues that integration that is merely symbolic, such as simply including verses from the Qur'an in science lessons, has the potential to lose its epistemological depth³⁸. The findings of this study indicate that such risks do exist, thus requiring the strengthening of teachers' capacity in understanding the integration of knowledge conceptually, rather than merely normatively.

The fieldwork findings also raise a more fundamental epistemological question regarding the nature of integration itself. Although classroom observations and teacher interviews demonstrated efforts to connect scientific concepts with Qur'anic verses and Islamic values, the evidence suggests that such integration remains predominantly pedagogical rather than epistemological. In many cases, integration was operationalized through the inclusion of relevant scriptural references to reinforce scientific topics or moral lessons. While this approach may strengthen students' religious engagement and ethical awareness, it does not necessarily resolve the deeper epistemological relationship between scientific and religious forms of knowledge.

This finding invites critical reflection on the extent to which integration at Al-Ittifaqiah has moved beyond a symbolic level. Several scholars have warned that the integration of science

³⁶ Imamuddin, "Transformasi Kurikulum Pesantren."

³⁷ AbūSulaymān and International Institute of Islamic Thought, *Islamization of Knowledge*.

³⁸ AbūSulaymān and International Institute of Islamic Thought, *Islamization of Knowledge*.

and religion may become superficial when scriptural texts are employed merely as legitimizing tools for scientific knowledge. Under such conditions, integration risks becoming a form of post hoc harmonization in which scientific findings are retrospectively matched with religious texts without engaging the methodological and epistemological differences between the two domains of knowledge.

The fieldwork data suggest that traces of this tendency may be present. Teachers frequently linked scientific concepts to Qur'anic verses; however, interviews revealed variations in how teachers understood the philosophical foundations of integration. Some educators viewed integration primarily as demonstrating that scientific discoveries are consistent with Islamic teachings, while others emphasized the ethical and value-oriented dimensions of science. These differing interpretations indicate that a shared institutional understanding of knowledge integration has not yet been fully developed.

The findings also reveal an unresolved challenge concerning situations in which contemporary scientific explanations may not align neatly with traditional interpretations of religious texts. Although no participant explicitly rejected scientific knowledge, interviews suggested that teachers generally preferred topics where scientific concepts and religious teachings appeared complementary. As a result, limited attention was given to discussing areas of potential tension, ambiguity, or interpretive complexity. This tendency may reflect a broader concern among educators about maintaining religious certainty while engaging with rapidly evolving scientific knowledge.

From an epistemological perspective, the significance of this finding lies not in identifying a failure of integration but in exposing the complexities inherent in the process itself. The challenge facing Islamic education is not simply how to connect scientific concepts with religious references, but how to cultivate intellectual frameworks that enable students and teachers to engage critically with both revelation and empirical inquiry. Such an approach requires moving beyond the assumption that every scientific finding must be directly validated through scripture. Instead, integration may be better understood as an ongoing dialogue between different sources of knowledge, each possessing distinct methods, scopes, and forms of authority.

Consequently, the case of Al-Ittifaqiah illustrates that the strengthening of Islamic education in the era of global disruption involves not only curriculum innovation and pedagogical reform but also deeper epistemological development. The findings suggest that future efforts should focus on enhancing teachers' capacity to address complex relationships between science and religion, including areas of uncertainty, disagreement, and interpretive diversity. Such capacity is essential if integration is to function as a meaningful intellectual project rather than merely a symbolic educational practice.

Research findings related to pedagogical innovation show that Islamic boarding schools are beginning to adopt more participatory and contextual learning approaches, while still maintaining traditional boarding school methods. These findings support the view that which emphasises that pedagogical innovation in Islamic education should not be disruptive to tradition, but rather adaptive and integrative³⁹.

This finding suggests a distinctive characteristic of the educational approach at Al-Ittifaqiah. While technological literacy is increasingly emphasized across various educational settings, the pesantren environment provides an additional ethical framework through which technological developments are interpreted and assessed. Students are encouraged not only to

³⁹ Sari et al., *Strategi Pembelajaran Mendalam*.

ask whether a technology is useful or effective, but also whether its use is beneficial, responsible, and consistent with Islamic moral values. In this sense, religious values function as a normative filter that shapes students' engagement with digital technology.

Importantly, the findings do not imply that ethical reflection is absent in secular or public schools. Rather, the Al-Ittifaqiah case suggests that pesantren education may offer a more explicit and systematically articulated moral framework for evaluating technological change. This framework enables students to approach technology not simply as consumers or users, but as moral agents responsible for the consequences of their digital behavior.

Consequently, moral caution should not be understood as a barrier to technological adaptation. Instead, the findings indicate that it can serve as a pedagogical resource that encourages critical digital literacy. By combining technological competence with ethical and religious reflection, students are potentially better equipped to navigate the opportunities and risks of digital transformation. Thus, the contribution of Islamic education in the era of global disruption may lie not only in preparing students to use technology effectively, but also in helping them develop the moral judgment necessary to use it responsibly.

In the context of the era of global disruption, these results are also in line with research which emphasises that pedagogical innovation in the Society 5.0 era must integrate technology, ethics, and religious values in a balanced manner. The findings of this study indicate that some teachers' concerns about the negative impact of technology are a form of moral caution that can actually be a strength if accompanied by adequate digital literacy⁴⁰.

An important finding of this study is that teachers' concerns regarding the potential negative effects of digital technology should not be interpreted solely as resistance to technological change. Rather, fieldwork data suggest that such concerns function as a form of moral caution that shapes how technology is introduced, evaluated, and utilized within the educational environment.

Interviews with teachers revealed that concerns about technology were primarily related to issues such as students' exposure to inappropriate online content, declining discipline, excessive dependence on digital devices, and the weakening of face-to-face social interactions. At the same time, these teachers generally acknowledged the educational benefits of digital technology and did not advocate its rejection. Instead, they emphasized the importance of guiding students to use technology responsibly and in accordance with Islamic ethical principles.

This finding is particularly significant because it suggests that technology within the pesantren context is not viewed as a value-neutral instrument. Rather, its use is filtered through ethical and religious considerations that encourage students to evaluate not only what technology can do, but also how and for what purposes it should be used. Classroom observations and student interviews indicated that discussions of technology were often accompanied by reflections on responsibility, self-discipline, accountability, and the potential social consequences of digital behavior.

From this perspective, the contribution of Islamic education at Al-Ittifaqiah may lie less in limiting access to technology and more in providing an ethical framework through which technological developments are interpreted and assessed. This framework encourages students to engage with digital innovation critically rather than passively. Instead of viewing technological advancement as inherently positive or inherently harmful, students are encouraged to consider its moral implications, benefits, and risks in light of Islamic values.

⁴⁰ Sari et al., *Strategi Pembelajaran Mendalam*.

Importantly, the findings do not suggest that such ethical awareness is exclusive to pesantren students or absent in other educational settings. However, the fieldwork data indicate that religious values at Al-Ittifaqiah provide an additional interpretive framework that shapes students' engagement with technology. In this sense, moral caution functions not as a barrier to innovation but as a mechanism for ethical filtering and critical reflection. This finding contributes to ongoing debates about the role of Islamic education in preparing students not only to participate in a technologically advanced society but also to navigate its ethical challenges responsibly.

A rather controversial hypothesis in this study, namely that resistance to pedagogical innovation could actually weaken the resilience of Islamic education in the global era, is supported by empirical findings from field research. Teachers who are more open to innovation have been shown to be able to manage learning in a way that is more meaningful and relevant to students, without compromising Islamic values.

Findings on the impact of educational integration on santri reinforce this view Islamic education should ideally produce individuals who are intellectually superior and have strong character⁴¹. The integration of science and religion has been proven to help students understand science not as a value-free entity, but as a means to strengthen faith and moral responsibility. In a broader context, these findings have important implications for the development of Muslim human resources in the global era. Integrative Islamic education has the potential to produce graduates who are adaptive to change, critical of technological developments, and remain committed to Islamic ethical values. This addresses the concerns of some that the modernisation of Islamic education will erode religious identity.

From an institutional perspective, this study shows that Islamic boarding schools have great potential as a resilient model of Islamic education in an era of global disruption. However, this potential can only be realised if it is supported by a clear curriculum policy, improved teacher competence, and the provision of adequate learning facilities. These findings are in line with the recommendations of various Islamic education studies that emphasise the importance of contextual and participatory institutional reform of Islamic boarding schools⁴².

Based on the findings and limitations of this study, further research can be directed at several aspects. First, comparative studies between Islamic boarding schools are needed to identify variations in models of science and religion integration. Second, quantitative or mixed methods research can be conducted to measure more objectively the impact of educational integration on student learning outcomes and character. Third, longitudinal studies are important to assess the sustainability of pedagogical innovations in the long term.

Overall, this discussion emphasises that strengthening Islamic education in an era of global disruption is a multidimensional process that encompasses epistemological integration, pedagogical innovation, and institutional transformation. Research findings at the Al-Ittifaqiah Indralaya Islamic boarding school show that the integration of science, religion, and pedagogical innovation is not only possible but also a strategic necessity for maintaining the relevance and sustainability of Islamic education amid global dynamics.

⁴¹ Dr Ade Mahmud M.Pd and Tatu Zakiyatun Nufus M.Pd, *Manajemen Integrasi Kurikulum: Dalam Peningkatan Mutu Lulusan Pondok Pesantren* (Penerbit Filomedia Pustaka, 2025).

⁴² Hadi Mulyo Wibowo, "Islamic Education Management Strategies for Improving Learning Quality in Islamic Boarding Schools," *Jurnal Ilmiah Manajemen Kesatuan* 13, no. 6 (2025): 5623–34, <https://doi.org/10.37641/jimkes.v13i6.4350>.

Conclusion

This study demonstrates that the strengthening of Islamic education in the era of global disruption is not merely a matter of adopting technology or expanding religious instruction, but involves a continuous process of negotiating the relationship between scientific knowledge, Islamic values, and pedagogical innovation. The case of Al-Ittifaqiah Indralaya shows that educational integration is being pursued through classroom practices, ethical guidance, and selective technological adaptation, although it has not yet been fully institutionalized within curriculum structures and organizational policies.

A key contribution of this study is the identification of the tensions that accompany educational transformation in pesantren settings. While teachers generally support innovation, they also express concerns regarding moral degradation, digital dependency, and the preservation of pesantren traditions. These findings suggest that the challenge of Islamic education lies not in choosing between modernization and tradition, but in developing sustainable mechanisms that allow both to coexist productively.

The study also contributes to the discourse on integrative Islamic education by showing that the integration of science and religion remains largely pedagogical and contextual rather than epistemological. This finding highlights the need for stronger teacher preparation, clearer institutional frameworks, and deeper engagement with the philosophical foundations of knowledge integration.

This study is limited by its focus on a single pesantren case, which restricts the generalizability of the findings. Future research should therefore examine diverse Islamic educational institutions across different contexts and employ comparative or mixed-method approaches to explore how various models of integration influence educational outcomes, character development, and institutional transformation.

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