

Policy on the Use of Artificial Intelligence in Muhammadiyah Primary and Secondary Educational Institutions

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Abstract: The rapid development of artificial intelligence (AI) in education presents academic challenges for Muhammadiyah educational institutions in balancing learning modernization with Islamic values, teacher readiness, and technological infrastructure limitations. This study aims to analyze AI integration policies in the Ismuba curriculum (Al-Islam, Kemuhammadiyah, and Bahasa Arab) and identify the challenges and effectiveness of its implementation. The research employs a qualitative descriptive method with a literature review approach to explore policies, challenges, and the impact of AI integration in Muhammadiyah educational institutions. The findings indicate that AI enhances learning effectiveness through personalized content, interactive materials, and more objective academic assessments, thereby supporting students' understanding of Islamic values and Kemuhammadiyah. However, key challenges include teacher preparedness, disparities in technological access, and the need for regulations to ensure AI is used ethically and aligns with Islamic educational principles. In conclusion, with well-formulated policies and a strategic implementation approach, AI can be a transformative tool that strengthens the Muhammadiyah education system without compromising Islamic values, fostering a generation that intellectually, spiritually, and morally excels.

Keywords: Artificial Intelligence; Muhammadiyah Education; Ismuba Curriculum; Implementation Challenges

Abstrak: Perkembangan pesat kecerdasan buatan (artificial intelligence/AI) dalam pendidikan menimbulkan tantangan akademik bagi lembaga pendidikan Muhammadiyah dalam menyeimbangkan modernisasi pembelajaran dengan nilai-nilai Islam, kesiapan guru, dan keterbatasan infrastruktur teknologi. Penelitian ini bertujuan untuk menganalisis kebijakan integrasi AI dalam kurikulum Ismuba (Al-Islam, Kemuhammadiyah, dan Bahasa Arab) serta mengidentifikasi tantangan dan efektivitas implementasinya. Penelitian menggunakan metode deskriptif kualitatif dengan pendekatan kepustakaan untuk mengeksplorasi

kebijakan, tantangan, dan dampak integrasi AI di lembaga pendidikan Muhammadiyah. Temuan penelitian menunjukkan bahwa AI meningkatkan efektivitas pembelajaran melalui konten yang dipersonalisasi, materi interaktif, dan penilaian akademik yang lebih objektif, sehingga mendukung pemahaman siswa terhadap nilai-nilai Islam dan Muhammadiyah. Namun, tantangan utama meliputi kesiapan guru, kesenjangan akses teknologi, dan perlunya regulasi untuk memastikan AI digunakan secara etis dan selaras dengan prinsip-prinsip pendidikan Islam. Kesimpulannya, dengan kebijakan yang dirumuskan dengan baik dan pendekatan implementasi yang strategis, AI dapat menjadi alat transformatif yang memperkuat sistem pendidikan Muhammadiyah tanpa mengorbankan nilai-nilai Islam, sekaligus melahirkan generasi yang unggul secara intelektual, spiritual, dan moral.

Kata Kunci: Kecerdasan Buatan; Pendidikan Muhammadiyah; Kurikulum Ismuba; Tantangan Penerapan

INTRODUCTION

The education sector is undergoing massive disruption due to the rapid advancement of technology, particularly artificial intelligence (AI).¹ Conceptually designed to mimic human intelligence through algorithms and machine learning, AI is increasingly being adopted in education systems to address the complexities of 21st-century challenges.² On a global scale, this revolution is driven by technological advancements and future-oriented visions such as Society 5.0, which emphasizes the harmonization of humans, technology, and the environment to create a sustainable society.³ In education, this vision promotes a more dynamic learning ecosystem where AI is a strategic partner in optimizing teaching and learning processes, managing administration, and providing innovative solutions to issues such as unequal access to education.⁴

However, despite its vast potential, AI integration in education presents multidimensional challenges.⁵ One significant concern is ethical issues, as easy access to AI technology may undermine academic integrity through

¹ Omar Ali et al., "The Effects of Artificial Intelligence Applications in Educational Settings: Challenges and Strategies," *Technological Forecasting and Social Change* 199 (February 2024): 123076, <https://doi.org/10.1016/j.techfore.2023.123076>.

² Yongjun Xu et al., "Artificial Intelligence: A Powerful Paradigm for Scientific Research," *The Innovation* 2, no. 4 (November 2021): 100179, <https://doi.org/10.1016/j.xinn.2021.100179>.

³ Rame Rame, Purwanto Purwanto, and Sudarno Sudarno, "Industry 5.0 and Sustainability: An Overview of Emerging Trends and Challenges for a Green Future," *Innovation and Green Development* 3, no. 4 (December 2024): 100173, <https://doi.org/10.1016/j.igd.2024.100173>.

⁴ Thuong Nguyen, Hoang Tran, and Minh Nguyen, *Empowering Education: Exploring the Potential of Artificial Intelligence; Chapter 9 -Artificial Intelligence (AI) in Teaching and Learning: A Comprehensive Review*, 2023.

⁵ Ali et al., "The Effects of Artificial Intelligence Applications in Educational Settings."

undetectable plagiarism practices.⁶ Additionally, there are fears of educational dehumanization, where human interaction and teacher engagement are increasingly replaced by automated systems, potentially diminishing the role of educators in character and value formation.⁷ Another challenge lies in competency gaps, as many educators are not yet technically or pedagogically prepared to integrate AI into curricula, while digital infrastructure remains unevenly distributed across different regions.⁸

These challenges become even more complex in Indonesia, where cultural diversity, geographical disparities, and digital literacy levels vary significantly.⁹ Muhammadiyah, with its extensive and influential educational network, plays a crucial role in bridging these gaps.¹⁰ As an organization committed to modernizing Islamic education, Muhammadiyah not only responds pragmatically to technological developments but also integrates them within a solid Islamic framework through the Ismuba curriculum (Al-Islam, Kemuhammadiyahan, and Bahasa Arab), which serves as the foundation for educational operations.¹¹ Integrating AI into this curriculum aligns with the *tajdid* (renewal) principle, where technology is utilized for personalized learning, analyzing students' religious comprehension, and providing adaptive platforms for remote areas without neglecting the classical Islamic knowledge tradition.¹² This curriculum aims to develop a generation that is not only technologically

⁶ Damian Okaibedi Eke, "ChatGPT and the Rise of Generative AI: Threat to Academic Integrity?" *Journal of Responsible Technology* 13 (April 2023): 100060, <https://doi.org/10.1016/j.jrt.2023.100060>.

⁷ Yatha Yuni, Les Tia Hanifa, and Hegar Harini, "Pengembangan Proses Pembelajaran Berbasis Pendidikan Karakter Di Kelas," *Jurnal Citizenship Virtues* 4, no. 1 (2024).

⁸ Muhamad Khoerudin and Dwi Noviani, "Perkembangan Teknologi Pembelajaran Hibrida di Era Pasca Pandemi," *J-CEKI: Jurnal Cendekia Ilmiah* 3, no. 6 (2024).

⁹ Maulana Akbar and Gustaf Wijaya, "Digital Literacy of Rural Areas in Indonesia: Challenges and Opportunities," June 13, 2024, <https://doi.org/10.4108/eai.1-11-2023.2344347>.

¹⁰ I Gede Bagus Winaka Palguna et al., "Peran Muhammadiyah Dalam Mencetak Generasi Unggul Melalui Pendidikan," *Fathir: Jurnal Studi Islam* 2, no. 1 (February 7, 2025): 82–95, <https://doi.org/10.71153/fathir.v2i1.192>.

¹¹ Eka Damayanti et al., "Meneropong Pendidikan Islam di Muhammadiyah," *Al asma: Journal of Islamic Education* 3, no. 2 (November 30, 2021): 250, <https://doi.org/10.24252/asma.v3i2.23826>.

¹² Anon Karim, "Integration of AI Tools in Islamic Education Curriculum Development Management: Challenges and Opportunities," *SSRN Electronic Journal* 1, no. 3 (2024), <https://doi.org/10.2139/ssrn.5044475>.

literate but also deeply rooted in the values of the Qur'an, Islamic scholarly traditions, and Muhammadiyah principles.¹³

Based on this background, this study seeks to answer two key questions: Is Muhammadiyah's policy on AI integration into the Ismuba curriculum effective? What are the biggest challenges in implementing AI in the Ismuba curriculum? These questions aim to critically identify and analyze Muhammadiyah's policy regarding AI implementation in its primary and secondary educational institutions.

LITERATUR REVIEW

AI Integration in Education: Global and Islamic Contexts

Integrating Artificial Intelligence (AI) in education has been widely explored as a transformative tool for enhancing pedagogical practices, personalizing learning, and addressing systemic challenges such as accessibility and equity.¹⁴ Globally, AI applications in education range from adaptive learning platforms to automated assessment systems, all aimed at optimizing student engagement and outcomes.¹⁵ However, ethical concerns, such as data privacy, algorithmic bias, and the risk of dehumanizing education, remain critical barriers to its widespread adoption.¹⁶

In Islamic education, AI adoption is often framed within the dual objectives of modernization and preservation of religious values. Studies highlight AI's potential to enhance Quranic literacy through interactive apps, simulate moral decision-making via gamified scenarios, and analyze student comprehension of Islamic principles.¹⁷ For instance, AI-driven tools like

¹³ Sri Lestari, "Pengembangan Kurikulum Al-Islam, Kemuhammadiyah dan Bahasa Arab (Ismuba) Di SD Muhammadiyah Bendo Kulon Progo," *Equilibrium: Jurnal Pendidikan* 9, no. 1 (2021).

¹⁴ Xu et al., "Artificial Intelligence"; Firuz Kamalov, David Santandreu Calonge, and Ikhlās Gurrib, "New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution," *Sustainability* 15, no. 16 (August 16, 2023): 12451, <https://doi.org/10.3390/su151612451>.

¹⁵ Zachari Swiecki et al., "Assessment in the Age of Artificial Intelligence," *Computers and Education: Artificial Intelligence* 3 (2022): 100075, <https://doi.org/10.1016/j.caeai.2022.100075>; Ali et al., "The Effects of Artificial Intelligence Applications in Educational Settings."

¹⁶ Eke, "ChatGPT and the Rise of Generative AI"; Karin Stolpe and Jonas Hallström, "Artificial Intelligence Literacy for Technology Education," *Computers and Education Open* 6 (June 2024): 100159, <https://doi.org/10.1016/j.caeo.2024.100159>.

¹⁷ Moh Zarkani et al., "Actualization of the Use of Artificial Intelligence (AI) in Developing Islamic Education in the Era of Society 5.0," *Khazanah Pendidikan Islam* 6, no. 1 (2024): 57–71, <https://doi.org/10.15575/kp.v6i1.41312>; Wiwik Sumariati, Syarifan Nurjan, and Muhammad 'Azam Muttaqin, "Penanaman Moral Keagamaan Anak Berbasis Animasi Kisah

chatbots have been used to teach Arabic grammar and Islamic ethics, demonstrating improved student motivation and retention.¹⁸ However, scholars caution against over-reliance on technology, emphasizing the irreplaceable role of teachers in nurturing spiritual and moral development.¹⁹

AI in Muhammadiyah Education: Bridging Modernity and Tradition

Muhammadiyah, as a pioneer of modernist Islamic education in Indonesia, faces unique challenges in balancing technological innovation with its commitment to Islamic values. The Ismuba curriculum (Al-Islam, Kemuhammadiyahan, and Bahasa Arab) is the backbone of Muhammadiyah's educational philosophy, integrating religious teachings with contemporary knowledge.²⁰ Recent studies explore AI's role in this context, such as adaptive platforms for teaching Kemuhammadiyahan principles and AI-generated simulations of prophetic stories.²¹ These tools align with the principle of *tajdid* (renewal), which encourages technology to advance Islamic education while preserving its core tenets.²²

However, infrastructural and cultural challenges persist. Research by Akbar & Wijaya (2024) underscores the digital divide in rural Indonesian

Nabi Muhammad SAW,” *PAUD Lectura: Jurnal Pendidikan Anak Usia Dini* 8, no. 01 (October 13, 2024): 16–33, <https://doi.org/10.31849/paud-lectura.v8i01.21549>.

¹⁸ Chinedu Wilfred Okonkwo and Abejide Ade-Ibijola, “Chatbots Applications in Education: A Systematic Review,” *Computers and Education: Artificial Intelligence* 2 (2021): 100033, <https://doi.org/10.1016/j.caeai.2021.100033>; Azie Ony Sapura and Hasan Basri, “Implementasi Penggunaan Artificial Intelligence Pada Pembelajaran Al-Islam Di Digital Technology Class Program,” *TARLIM Jurnal Pendidikan Agama Islam* 7, no. 2 (2024): 179–88.

¹⁹ Sodikin Sodikin, “Transformasi Pendidikan Agama Islam Melalui Artificial Intelligent (AI): Upaya Meningkatkan Kemampuan Berpikir Kritis Mahasiswa,” *Academicus: Journal of Teaching and Learning* 3, no. 2 (September 5, 2024): 78–89, <https://doi.org/10.59373/academicus.v3i2.65>; Nurul Izzah Yasmin and Muhammad Taufiq, “Membangun Karakter Islami melalui Desain Pembelajaran Digital,” *CENDEKIA: Jurnal Ilmu Sosial, Bahasa dan Pendidikan* 4, no. 4 (2024): 132–46, <https://doi.org/10.55606/cendikia.v4i4.3300>.

²⁰ Damayanti et al., “Meneropong Pendidikan Islam di Muhammadiyah”; Rizal Fathurrohman et al., “Innovation Transformation of the Islamic Religious Education Curriculum at MAS Al-Islamiyah Bebidas, East Lombok,” *Belajea: Jurnal Pendidikan Islam* 9, no. 2 (November 20, 2024): 55–68, <https://doi.org/10.29240/belajea.v9i2.8221>.

²¹ Novianto Yudha Laksana, Ayu Usada Rengkaningias, and Wuri Handayani, “Diffusion of Artificial Intelligence-Based Learning Innovation; A Case Study in MTs Muhammadiyah Tawangsari Sukoharjo,” *Informasi* 53, no. 2 (March 15, 2024): 321–30, <https://doi.org/10.21831/informasi.v53i2.71865>; Septian Dwi Prasetyo et al., “Aplikasi Game Simulasi 3D Pencegahan Bullying Anak Remaja Berbasis Role Playing Menggunakan Metode FSM dan BT,” *KLIK: Kajian Ilmiah Informatika dan Komputer* 4, no. 6 (2024).

²² Yusuf Bachtiar and Muh Nur Rochim Maksam, “Menghadapi Dinamika Dakwah Di Era Artificial Intelligence: Perspektif Muhammadiyah,” *Jurnal Kajian Agama Islam* 8, no. 6 (2024).

schools, where limited internet access and outdated hardware hinder AI adoption.²³ Similarly, teacher readiness remains critical, as many educators lack training to utilize AI tools effectively.²⁴ Studies also emphasize the need for ethical guidelines to ensure AI-generated content adheres to Islamic principles, such as avoiding bias in fatwa-related simulations or ensuring gender equity in educational games.²⁵

RESEARCH METHOD

This study employs a descriptive qualitative method to understand how artificial intelligence (AI) is integrated into the Ismuba curriculum. The research aims to explore AI's integration, policies, and implementation in this context by focusing on a literature review to answer the research questions.²⁶ The findings will be elaborated further in the results and discussion section.

A literature review is chosen as the primary approach because it allows researchers to collect and analyze data from various existing sources, one of which is the Ismuba Curriculum Book (Al-Islam, Kemuhammadiyah, and Bahasa Arab).²⁷ This book is an academic foundation for educators to implement and integrate the curriculum with AI. As a central element in the educational context, the literature review provides a strong theoretical basis and enables researchers to identify research trends and gaps in the existing

²³ Akbar and Wijaya, "Digital Literacy of Rural Areas in Indonesia: Challenges and Opportunities."

²⁴ Suharyo Suharyo, Subyantoro Subyantoro, and Rahayu Pristiwati, "Kecerdasan Buatan Dalam Konteks Kurikulum Merdeka Pada Jenjang Pendidikan Dasar Dan Menengah: Membangun Keterampilan Menuju Indonesia Emas 2045," *HUMANIKA* 30, no. 2 (January 10, 2024): 208–17, <https://doi.org/10.14710/humanika.v30i2.60563>; Ramadhoni Aulia Gusli, Supratman Zakir, and Muaddyl Akhyar, "Tantangan Guru terhadap Perkembangan Teknologi Agar Memanfaatkan Artificial Intelligence Dalam Meningkatkan Kemampuan Siswa," *Idarah Tarbiyah: Journal of Management in Islamic Education* 4, no. 3 (November 17, 2023): 229–40, <https://doi.org/10.32832/itjmie.v4i3.15418>.

²⁵ Muhammad Daffa and Fabhian Aliy Rajaie Kamil, "Dinamika Kebenaran Epistemik Keagamaan Dalam Tantangan Dan Pembaharuan Pada Era Penggunaan Kecerdasan Buatan," *Jurnal Riset Agama* 3, no. 3 (December 27, 2023): 428–49, <https://doi.org/10.15575/jra.v3i3.32014>; Sartini Sartini et al., "Tantangan Kepemimpinan Adaptif Dalam Dunia Pendidikan Di Era Generasi Milenial," *TEACHING: Jurnal Inovasi Keguruan Dan Ilmu Pendidikan* 4, no. 2 (July 13, 2024): 98–110, <https://doi.org/10.51878/teaching.v4i2.3047>.

²⁶ Ni Kadek Armini, "Evaluasi Metode Penilaian Perkembangan Siswa Dan Pendidikan Karakter Dalam Kurikulum Merdeka Pada Sekolah Dasar," *Metta: Jurnal Ilmu Multidisiplin* 4, no. 1 (February 10, 2024): 98–112, <https://doi.org/10.37329/metta.v4i1.2990>.

²⁷ Majelis Pendidikan Dasar dan Menengah Pimpinan Pusat Muhammadiyah, *Kurikulum Pendidikan Al-Islam, Kemuhammadiyah Dan Bahasa Arab (Ismuba)*, 2017.

literature.²⁸ This method reinforces current academic knowledge and offers practical guidance for educators and policymakers in Muhammadiyah institutions regarding AI integration in the Ismuba curriculum. Understanding how the Ismuba curriculum is designed to meet students' needs will facilitate the effective implementation of AI in the digital era.

The research design in this literature review follows a systematic and structured process for identifying data, evaluating sources, and synthesizing relevant literature. The implementation stages include selecting the research topic focusing on AI integration in the Ismuba curriculum, reviewing relevant literature, selecting articles, collecting data, analyzing findings, and presenting conclusions.

RESULTS AND DISCUSSIONS

Effectiveness of AI Integration in the Ismuba Curriculum

The Directorate General of Primary and Secondary Education of Muhammadiyah has developed the Ismuba curriculum (Al-Islam, Kemuhammadiyah, and Bahasa Arab) to enhance the quality of education. The Ismuba curriculum encompasses the concepts and principles of teaching and assessment, graduate competency standards, curriculum structure, and learning load.²⁹ It is designed based on an educational hierarchy that emphasizes strengthening faith, devotion, and noble character (*akhlak al-karimah*).³⁰ The primary goal of this curriculum development is to create a learning environment that integrates spirituality, morality, and intellectuality.³¹ This aligns with the vision of Muhammadiyah education, which focuses on academic achievement and emphasizes the formation of students' character, ensuring they grow into ethical, modern, and progressive individuals.³²

²⁸ Hardani et al., *Metode Penelitian Kualitatif Dan Kuantitatif* (Yogyakarta: CV. Pustaka Ilmu, 2020).

²⁹ Majelis Pendidikan Dasar dan Menengah Pimpinan Pusat Muhammadiyah, *Kurikulum Pendidikan Al-Islam, Kemuhammadiyah Dan Bahasa Arab (Ismuba)*.

³⁰ Muhammad Irfan Faturrahman, "Urgensi kurikulum ISMUBA dalam membentuk karakter siswa Sekolah Menengah Kejuruan Muhammadiyah," *Journal of Islamic Education and Innovation* 3, no. 1 (June 30, 2022): 47–55, <https://doi.org/10.26555/jiei.v3i1.6428>.

³¹ Ahmad Asron Mundofi, "Pengembangan Kurikulum ISMUBA dalam Meningkatkan Kualitas Pendidikan Muhammadiyah," no. 1 (2024).

³² Adi Syahputra, Mesiono Mesiono, and Haidir Haidir, "Implementation of Al-Islam Kemuhammadiyah As Efforts to Improve Student Characteristics," *Munaddhomah: Jurnal Manajemen Pendidikan Islam* 4, no. 2 (June 2, 2023): 408–18, <https://doi.org/10.31538/munaddhomah.v4i2.394>.

In this context, the integration of artificial intelligence (AI) serves as a strategic solution to strengthen the objectives of the Ismuba curriculum.³³ From a spiritual perspective, AI facilitates a more interactive approach to learning the Qur'an and deepens students' understanding of Islamic values through personalized content and adaptive learning approaches, increasing their motivation to study the Qur'an.³⁴ Additionally, AI enables the creation of Islamic digital content, including engaging and interactive learning materials that align with Islamic principles.³⁵ These can be animated videos on Islamic history, podcasts on ethics, or educational games based on Islamic concepts.³⁶ Thus, AI integration in the Ismuba curriculum enriches spiritual and Islamic learning methodologies creatively and ensures that Islamic content is delivered more effectively, remains relevant, and meets students' individual needs.

On the other hand, the moral aspect is also reinforced through AI, which aligns learning with noble character principles.³⁷ AI enables educators to design interactive simulations incorporating stories of the Prophet's exemplary conduct, Muhammadiyah figures, or everyday moral dilemmas.³⁸ For example, through AI-based educational games, students are encouraged to choose responses in scenarios such as dealing with bullying, maintaining honesty during exams, or practising fairness in group work.³⁹ AI then analyzes each student's choices to provide feedback and guidance. However, while AI serves as a valuable tool in moral education, it does not replace the role of teachers as moral mentors; instead, it enhances their efforts by providing adaptive, engaging, and measurable learning methods.

AI is crucial in developing students' intellectual abilities through a critical, analytical, and data-driven learning approach in the spiritual and moral

³³ Laksana, Rengkaningias, and Handayani, "Diffusion of Artificial Intelligence-Based Learning Innovation; A Case Study in MTs Muhammadiyah Tawangsari Sukoharjo."

³⁴ Yasmicha Ulya Afif and Ana Rahayu Setia Ningrum, "Peran Strategis Pendidikan Agama Islam dalam Membentuk Generasi Berakhlak dan Berwawasan Keislaman di Era Digital," *MA'ALIM: Jurnal Pendidikan Islam* 5, no. 2 (2024).

³⁵ Yasmin and Taufiq, "Membangun Karakter Islami melalui Desain Pembelajaran Digital."

³⁶ Afif and Ningrum, "Peran Strategis Pendidikan Agama Islam dalam Membentuk Generasi Berakhlak dan Berwawasan Keislaman di Era Digital."

³⁷ Azie Ony Sapura and Hasan Basri, "Implementasi Penggunaan Artificial Intelligence Pada Pembelajaran Al-Islam Di Digital Technology Class Program."

³⁸ Wiwik Sumariati, Syarifan Nurjan, and Muhammad 'Azam Muttaqin, "Penanaman Moral Keagamaan Anak Berbasis Animasi Kisah Nabi Muhammad SAW."

³⁹ Prasetyo et al., "Aplikasi Game Simulasi 3D Pencegahan Bullying Anak Remaja Berbasis Role Playing Menggunakan Metode FSM dan BT."

domains.⁴⁰ In the Ismuba Curriculum, which integrates religious knowledge with science and technology, AI serves as a tool to enhance higher-order thinking skills.⁴¹ For instance, AI can design interactive problem-based learning (PBL) experiences, such as simulated debates on contemporary fatwas or analyses of global Islamic trends, encouraging students to memorize material and refine their logic, creativity, and problem-solving abilities.⁴² Through this approach, students are trained to become a thoughtful, reflective generation equipped to tackle modern challenges with a strong foundation of knowledge.

Thus, the synergy of these three aspects affirms that AI is not a replacement for teachers but a strategic partner that enriches learning methodologies. By adhering to the principles of *tajdid* (renewal) and *al-mubafazhah' ala al-qadim al-shalih* (preserving valuable traditions), the Ismuba curriculum leverages AI to cultivate a progressive generation that is spiritually strong, morally steadfast, and intellectually intelligent.⁴³ These students are prepared to navigate the dynamics of modern times and serve as role models who uphold the values of *rahmatan lil'alamin*, aligning with Muhammadiyah's educational vision of shaping *insan kamil* (a well-rounded individual).

In addition to facilitating the achievement of curriculum objectives, AI also supports teachers in planning, implementing, and evaluating learning. AI reduces administrative workload during planning, particularly in developing Lesson Plans (LP). By utilizing AI systems, teachers can gather data on students' abilities and learning preferences, enabling the automatic processing of historical data and initial assessments.⁴⁴ This results in more targeted and well-structured lesson plans. Moreover, teachers can leverage AI tools, such as ChatGPT, to assist in creating more adaptive lesson plans tailored to the school's needs and

⁴⁰ M. M. Kamruzzaman et al., "AI- and IoT-Assisted Sustainable Education Systems during Pandemics, Such as COVID-19, for Smart Cities," *Sustainability* 15, no. 10 (May 21, 2023): 8354, <https://doi.org/10.3390/su15108354>.

⁴¹ Mundofi, "Pengembangan Kurikulum ISMUBA dalam Meningkatkan Kualitas Pendidikan Muhammadiyah"; Sodikin, "Transformasi Pendidikan Agama Islam Melalui Artificial Intelligent (AI)."

⁴² Zarkani et al., "Actualization of the Use of Artificial Intelligence (AI) in Developing Islamic Education in the Era of Society 5.0"; Mas Ayu Rizka Septiani Putri et al., "Pengaruh Model Pembelajaran PBL Berbasis Artificial Intelligence Terhadap Hasil Belajar Siswa," *SOCIAL: Jurnal Inovasi Pendidikan IPS* 4, no. 3 (September 10, 2024): 145–54, <https://doi.org/10.51878/social.v4i3.3256>.

⁴³ Bachtiar and Maksum, "Menghadapi Dinamika Dakwah Di Era Artificial Intelligence: Perspektif Muhammadiyah."

⁴⁴ Raharjo, "Peranan Artificial Intelligence(Kecerdasan Buatan) Dalam Penyusunan Media Pembelajaran" (Seminar Nasional Biologi "Inovasi Penelitian dan Pembelajaran Biologi VII (IP2B VII), Surabaya, 2023).

students' characteristics.⁴⁵ Thus, despite the heavy administrative workload, AI enables teachers to develop teaching materials more effectively and efficiently.

AI offers key functionalities during the implementation stage, making learning more effective and engaging.⁴⁶ With its personalization and adaptability, AI can analyze each student's performance in detail and adjust the learning materials according to their needs. This allows students to track their progress in real-time and stay motivated to keep learning.⁴⁷ In practice, AI technology has shown significant results, particularly in enhancing personalized learning experiences.⁴⁸ Additionally, AI-based learning often integrates gamification elements, such as point systems, rewards, and interactive challenges, transforming education into a more engaging and enjoyable experience.⁴⁹ Furthermore, AI provides accessibility features to support students with special needs or different learning styles, ensuring that every learner feels valued and actively involved in the educational process.⁵⁰

AI technology is crucial in providing student performance-based assessments during the evaluation stage.⁵¹ Automated and intelligent systems, including AI-powered chatbots, enable teachers to analyze and assess students' learning abilities quickly and accurately.⁵² AI delivers effective feedback through

⁴⁵ Hermila A., Rahmat Taufik R.L. Bau, and Abd. Aziz Bouty, "Penggunaan ChatGPT Sebagai Sumber Pembelajaran Adaptif Untuk Menanggapi Kebutuhan Individu Siswa," *VOCATECH: Vocational Education and Technology Journal* 5, no. 2 (April 23, 2024): 126–35, <https://doi.org/10.38038/vocatech.v5i2.170>.

⁴⁶ Akhilesh Saini, Deepika Sharma, and Kritika Tripathi, "Artificial Intelligence (AI) in Education: Using AI Tools for Teaching and Learning Process," *IJIREEICE* 13, no. 2 (February 15, 2025), <https://doi.org/10.17148/IJIREEICE.2025.13206>.

⁴⁷ Joupny G Z Mambu et al., "Pemanfaatan Teknologi Artificial Intelligence (AI) Dalam Menghadapi Tantangan Mengajar Guru di Era Digital," *Journal on Education* 6, no. 1 (2023).

⁴⁸ Maher Joe Khan Omar Jian, "Personalized Learning Through AI," *Advances in Engineering Innovation* 5, no. 1 (December 25, 2023): 16–19, <https://doi.org/10.54254/2977-3903/5/2023039>.

⁴⁹ Febrianto Hakeu, Idan I. Pakaya, and Mutmain Tangkudung, "Pemanfaatan Media Pembelajaran Berbasis Gamifikasi dalam Proses Pembelajaran di MIS Terpadu Al-Azhfar," *Anwaliyah: Jurnal Pendidikan Guru Madrasah Ibtidaiyah* 6, no. 2 (December 15, 2023): 154–66, <https://doi.org/10.58518/awwaliyah.v6i2.1930>; Dyah Retno Wulan et al., "Exploring the Benefits and Challenges of Gamification in Enhancing Student Learning Outcomes," *Global International Journal of Innovative Research* 2, no. 7 (July 25, 2024): 1657–74, <https://doi.org/10.59613/global.v2i7.238>.

⁵⁰ Andini Susanti, Muhammad Adhitya, and Vera Maria, "Meningkatkan Inklusivitas Pendidikan Dengan Artificial Intelligence (AI) Untuk Personalisasi dan Aksesibilitas Untuk Semua," *Journal of Law, Education and Business* 2, no. 2 (September 30, 2024): 903–11, <https://doi.org/10.57235/jleb.v2i2.2695>.

⁵¹ Swiecki et al., "Assessment in the Age of Artificial Intelligence."

⁵² Okonkwo and Ade-Ibijola, "Chatbots Applications in Education."

real-time performance analysis, allowing educators to identify students' weaknesses or mistakes during the learning process.⁵³ Additionally, AI offers detailed explanations and personalized improvement strategies, such as assigning extra tasks tailored to each student's needs.⁵⁴ Overall, AI technology reduces teachers' workload and significantly enhances the quality of education, proving it to be an effective tool for optimizing the learning process.

Challenges in AI Implementation in the Ismuba Curriculum

Integrating artificial intelligence (AI) into the Ismuba curriculum presents significant challenges in aligning technology with Islamic values embedded in Muhammadiyah education.⁵⁵ While AI can potentially transform learning methods, the primary challenge is ensuring this technology is accepted and implemented without compromising the essence of religious teachings.⁵⁶ The Ismuba curriculum, which emphasizes cognitive aspects and affective and psychomotor development, must carefully consider how AI can enhance learning outcomes without diminishing the role of character-building and moral education in students.

One of the significant challenges in implementing AI in Muhammadiyah schools is the limited resources available.⁵⁷ While AI technology can enhance learning quality through personalization and adaptation to students' learning styles, its implementation requires adequate infrastructure, well-trained teachers, and advanced hardware.⁵⁸ Many Muhammadiyah schools and madrasahs still face budget constraints and limited access to the latest technology.⁵⁹ Therefore,

⁵³ Monika Hooda et al., "Artificial Intelligence for Assessment and Feedback to Enhance Student Success in Higher Education," ed. Vijay Kumar, *Mathematical Problems in Engineering* 2022 (May 5, 2022): 1–19, <https://doi.org/10.1155/2022/5215722>.

⁵⁴ A., Bau, and Bouty, "Penggunaan ChatGPT Sebagai Sumber Pembelajaran Adaptif Untuk Menanggapi Kebutuhan Individu Siswa."

⁵⁵ Ahmad Azhari, Muhammad Hasnan Nahar, and Muhammad Ardi Kurniawan, "Pengembangan Teknologi Pendidikan: Implementasi Aplikasi Ismuba Dalam Meningkatkan Kualitas Pendidikan Agama Islam Di SMA Muhammadiyah," in *Prosiding Seminar Nasional Hasil Pengabdian Kepada Masyarakat Universitas Abmad Dahlan* (Seminar Nasional Hasil Pengabdian kepada Masyarakat, Yogyakarta, 2024), 910–20.

⁵⁶ Daffa and Kamil, "Dinamika Kebenaran Epistemik Keagamaan Dalam Tantangan Dan Pembaharuan Pada Era Penggunaan Kecerdasan Buatan."

⁵⁷ Budi Hartono, "Teknologi Kecerdasan Buatan Dan Pentingnya Beradaptasi Dalam Cara Belajar," *Buletin Edukasi Indonesia* 3, no. 02 (June 20, 2024): 80–86, <https://doi.org/10.56741/bei.v3i02.602>.

⁵⁸ Mr. Siddhant Mishra, "Revolutionizing Education: The Impact of AI-Enhanced Teaching Strategies," *International Journal for Research in Applied Science and Engineering Technology* 12, no. 9 (September 30, 2024): 9–32, <https://doi.org/10.22214/ijraset.2024.64127>.

⁵⁹ Sartini et al., "Tantangan Kepemimpinan Adaptif Dalam Dunia Pendidikan Di Era Generasi Milenial."

significant investment is needed in infrastructure and teacher training to successfully integrate AI into the Ismuba curriculum to ensure effective and sustainable implementation.

Furthermore, technical skills present a significant challenge in integrating AI into Muhammadiyah's educational curriculum.⁶⁰ Teachers and educators must be trained to understand and utilize AI tools effectively.⁶¹ This involves not only basic technological proficiency but also a deeper understanding of how AI can enhance the quality of student interaction with learning materials.⁶² For instance, AI's ability to analyze student performance data and provide faster and more accurate feedback can be invaluable. Still, it requires comprehensive knowledge and proper training to be utilized optimally in the learning process.⁶³

Another challenge in implementing AI in Ismuba education is the changing role of teachers. In traditional education systems, teachers are the primary source of knowledge and authority in the classroom. However, with the integration of AI, their role may shift to that of facilitators or mentors, guiding students in navigating the various AI-powered learning resources. This transformation requires educators' mental and professional readiness to adapt to evolving technology while ensuring that AI integration does not diminish the crucial interpersonal relationships fundamental to the educational process.

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⁶⁰ Suharyo, Subyantoro, and Pristiwati, "Kecerdasan Buatan Dalam Konteks Kurikulum Merdeka Pada Jenjang Pendidikan Dasar Dan Menengah."

⁶¹ Xiao Tan, Gary Cheng, and Man Ho Ling, "Artificial Intelligence in Teaching and Teacher Professional Development: A Systematic Review," *Computers and Education: Artificial Intelligence* 8 (June 2025): 100355, <https://doi.org/10.1016/j.caeai.2024.100355>.

⁶² Stolpe and Hallström, "Artificial Intelligence Literacy for Technology Education."

⁶³ Sehan Rifky, "Dampak Penggunaan Artificial Intelligence Bagi Pendidikan Tinggi," *Indonesian Journal of Multidisciplinary on Social and Technology* 2, no. 1 (February 2, 2024): 37–42, <https://doi.org/10.31004/ijmst.v2i1.287>.

⁶⁴ Aulia Gusli, Zakir, and Akhyar, "Tantangan Guru terhadap Perkembangan Teknologi Agar Memanfaatkan Artificial Intelligence Dalam Meningkatkan Kemampuan Siswa."

⁶⁵ Siti Rukhani, "Peran Guru Dalam Pengelolaan Kelas Untuk Meningkatkan Prestasi Belajar Siswa Kelas VII," *Al-Athfal* 1, no. 1 (2021).

⁶⁶ Regita Amalia Septiani and Alifia Nasfa Ramadani, "AI: Apakah Guru Masih Punya Peran di Masa Depan," *Inspirasi Dunia: Jurnal Riset Pendidikan dan Bahasa* 4, no. 1 (January 16, 2025): 263–72, <https://doi.org/10.58192/insdun.v4i1.2947>.

evolving technology while ensuring that AI integration does not diminish the crucial interpersonal relationships fundamental to the educational process.

On the other hand, AI presents tremendous opportunities in developing more dynamic and relevant learning materials that align with modern educational needs.⁶⁷ AI can be utilized to continuously update Ismuba content, ensuring it remains aligned with advancements in science and technology. With its ability to provide up-to-date information and present materials in more engaging and easily understandable formats, AI facilitates more effective and efficient learning.⁶⁸ However, the challenge lies in ensuring that AI-generated content remains consistent with Islamic educational principles, emphasizing a balance between worldly and spiritual knowledge. Therefore, implementing AI in the Ismuba curriculum must be cautiously approached, carefully considering ethical dimensions, Islamic values, and the sustainability of religious teachings in education.

CONCLUSION

Muhammadiyah educational institutions have designed policies for integrating artificial intelligence (AI) into the Ismuba curriculum to enhance learning effectiveness, adapt teaching methods to student needs, and enrich the learning experience through interactive and adaptive technology. AI facilitates personalized learning, student data analysis, and access to engaging digital-based materials, thereby deepening students' understanding of Islamic values and Kemuhammadiyah.

The implications of AI integration in Muhammadiyah education include improving learning quality, enhancing school management efficiency, and increasing institutional competitiveness in the digital era. AI can strengthen Muhammadiyah's position as a pioneer of technology-based Islamic education while expanding educational access to a broader audience. However, challenges such as teacher readiness, infrastructure limitations, and the risk of over-reliance on technology must be addressed through sustainable policies. With the right strategies, AI can serve as a transformative tool supporting Muhammadiyah's vision of developing a progressive generation that is intellectually excellent, morally grounded, and well-prepared to face future challenges.

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