



## **Santri 5.0: Islamic Education In The Digital Era And Global Challenges In Mandailing Natal**

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**Abstrak:** Penelitian ini mengeksplorasi transformasi Pendidikan Islam di era digital dalam konteks pesantren klasik di Mandailing Natal – Ma'had Darul Ikhlas, Raihanul Jannah, dan Abinnur al-Islami – dengan fokus pada visi “Santri 5.0.” Menggunakan pendekatan kualitatif multisitus, studi ini mengungkapkan bahwa metode tradisional seperti sorogan dan bandongan tetap dominan, namun 70-80% santri mengakses ponsel untuk konten non-akademik, menunjukkan retakan dalam benteng tradisi. Media sosial menjadi pedang bermata dua: 65% santri memanfaatkannya untuk dakwah informal, tetapi 40% terpapar narasi sekuler dan radikal akibat minimnya literasi digital. Meskipun santri mendambakan inovasi (50-60%), kurikulum statis dan resistensi pengelola terhadap teknologi menghambat integrasi, meninggalkan potensi “Santri 5.0” tertunda. Penelitian ini menyimpulkan bahwa tanpa adaptasi pedagogis, pesantren berisiko kehilangan relevansi di era global, menegaskan urgensi pengembangan Pendidikan Islam yang responsif terhadap tantangan digital sambil mempertahankan identitas lokal.

**Kata Kunci:** Santri 5.0, Pendidikan Agama Islam, Era Digital, Pesantren Mandailing.

**Abstract:** This research explores the transformation of Islamic education in the digital era within the context of classical pesantren (Islamic boarding schools) in Mandailing Natal – namely Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami – with a focus on the vision of “Santri 5.0.” Employing a multisite qualitative approach, the study reveals that traditional methods such as sorogan and bandongan remain dominant. However, 70-80% of santri (students) use mobile phones primarily for non-academic content, indicating cracks in the fortress of tradition. Social media emerges as a double-edged sword: 65% of santri utilize it for informal da'wah (Islamic outreach), while 40% are exposed to secular and radical narratives due to limited digital literacy. Although santri express a desire for innovation (50-60%), static curricula and institutional resistance to technology hinder integration, leaving the potential of “Santri 5.0” unfulfilled. This study concludes that without pedagogical adaptation, pesantren



*risk losing relevance in the global era, underscoring the urgency of developing Islamic education that is responsive to digital challenges while preserving local identity.*

**Keywords:** *Santri 5.0, Islamic Religious Education, Digital Era, Mandailing Pesantren.*

## **A. INTRODUCTION**

Islamic Religious Education in the digital era faces a complex existential dilemma: maintaining its traditional essence while responding to global transformations driven by technology and limitless connectivity. In the context of Mandailing Natal, a region in North Sumatra known for its rich "Batak Mandailing" cultural heritage and strong Islamic roots, pesantren (Islamic boarding schools) as traditional educational institutions become battlegrounds between local heritage and modernity.<sup>1</sup> This study focuses on three classical pesantren—Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami—which, despite not yet adopting online applications in their learning processes, have demonstrated an ability to utilize mobile phones and social media for communication and social interaction. This phenomenon offers a unique lens to explore how Islamic education adapts to the digital era amidst global challenges, while questioning whether this transformation strengthens or erodes the religious and cultural identity of santri (students) in Mandailing land.

Santri 5.0 is a visionary concept that portrays a generation of santri in the digital era capable of integrating profound faith with cutting-edge technological expertise, responding to global challenges while retaining the roots of Islamic tradition and local identity.<sup>2</sup> Anchored in the paradigm of the 5.0 industrial revolution, which prioritizes the synergy between humans and machines, Santri 5.0 transcends proficiency in memorizing classical texts or mastering traditional methods such as sorogan and bandongan, encompassing robust digital literacy—enabling the effective use of social media for da'wah, critical navigation of online information, and collaboration within

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<sup>1</sup> Suryadi Nasution, Muhammad Ikbāl, and Ali Jusri Pohan, "Dinamika Pesantren : Studi Futuristic Transformasi-Tansmisi Sistem Pesantren Di Mandailing Natal," *Edukasi Islami: Jurnal Pendidikan Islam* 10, no. 3 (2021): 319–41, <https://doi.org/10.30868/ei.v10i001.1853>; Muhamamd Ikbāl, Ali Jusri Pohan, and Suryadi Nasution, *Pergumulan Sistem Pesantren: Transformasi Menuju Identitas Baru* (Mandailing Natal: Madina Publisher, 2021).

<sup>2</sup> Mussa Saidi Abubakari and Kassim Kalinaki, "Digital Competence in Islamic Education for Lifelong Learning: Preliminary Analysis Using DigComp 2.1 Framework," in *Embracing Technological Advancements for Lifelong Learning*, 2024, 1–31, <https://doi.org/10.4018/979-8-3693-1410-4.ch001>.



global networks.<sup>3</sup> Within the context of pesantren in Mandailing Natal, Santri 5.0 ideally acts as a conduit between the cultural legacy of Batak Muslim heritage and an interconnected world, employing technology as an instrument to strengthen faith, propagate Islamic values, and compete on the international stage, rather than merely serving as passive consumers or victims of digital disruption. This concept necessitates an evolution in pesantren, requiring the integration of technology into their pedagogical framework without sacrificing spiritual essence, thereby cultivating santri who are resilient, adaptable, and pertinent in the 21st century.

The digital era, often referred to as the Fourth Industrial Revolution and now shifting toward the 5.0 paradigm with an emphasis on more harmonious human-machine integration,<sup>4</sup> has radically transformed the educational landscape.<sup>5</sup> According to Schwab, this revolution is marked by technological acceleration that not only enhances efficiency but also introduces profound social disruption.<sup>6</sup> In the context of religious education, this disruption is evident in the way knowledge is transmitted – from face-to-face methods based on memorization and teacher authority to virtual

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<sup>3</sup> N Azizah et al., "Religious Moderation in The Industrial Era 4.0: Deradicalization Through The Development of Intellectual Traditions at Fadhlul Fadhlul Islamic Boarding School Semarang," *Jurnal Pendidikan Agama Islam* 20, no. 2 (2023): 233–46, <https://doi.org/10.14421/jpai.v20i2.7771>; G Kusuma Zamahsari et al., "Pedatren: Educational Administration Applications for Simplifying Paiton Probolinggo's Nurul Jadid Islamic Boarding School's Management," in *Proceedings of the 2023 17th International Conference on Ubiquitous Information Management and Communication, IMCOM 2023*, 2023, <https://doi.org/10.1109/IMCOM56909.2023.10035651>; H A B Malla et al., "Teachers' Digital Literacy Ability to Improve Islamic Religion Education Learning in Islamic Boarding School," *International Journal of Educational Reform*, 2023, <https://doi.org/10.1177/10567879231211287>.

<sup>4</sup> N. Novik et al., "Digital Learning Environment in Modern Conditions," in *CEUR Workshop Proceedings*, vol. 2861, 2020, 97–102; O.O. Hrytsenchuk and S.I. Trubachev, "Creation and Development of the Digital Learning Environment in Educational Institutions," in *ACM International Conference Proceeding Series*, 2021, 156–60, <https://doi.org/10.1145/3526242.3526257>.

<sup>5</sup> S.H. Mian et al., "Adapting Universities for Sustainability Education in Industry 4.0: Channel of Challenges and Opportunities," *Sustainability (Switzerland)* 12, no. 15 (2020), <https://doi.org/10.3390/su12156100>; A. Abulibdeh, E. Zaidan, and R. Abulibdeh, "Navigating the Confluence of Artificial Intelligence and Education for Sustainable Development in the Era of Industry 4.0: Challenges, Opportunities, and Ethical Dimensions," *Journal of Cleaner Production* 437 (2024), <https://doi.org/10.1016/j.jclepro.2023.140527>; S. Agrawal, N. Sharma, and S. Bhatnagar, *Education 4.0 to Industry 4.0 Vision: Current Trends and Overview, Lecture Notes in Mechanical Engineering*, 2021, [https://doi.org/10.1007/978-981-16-3033-0\\_45](https://doi.org/10.1007/978-981-16-3033-0_45).

<sup>6</sup> K. Raza and Y. Chen, "Assessing the Dynamic Impact of Natural Resource Utilization, Technological Innovation, and Environmental Regulations on OECD Economic Growth and Globalization," *Environment, Development and Sustainability*, 2024, <https://doi.org/10.1007/s10668-024-05741-9>; M.R. Sultanuzzaman et al., "Effects of Export and Technology on Economic Growth: Selected Emerging Asian Economies," *Economic Research-Ekonomika Istrazivanja* 32, no. 1 (2019): 2515–31, <https://doi.org/10.1080/1331677X.2019.1650656>.



spaces enabling unlimited access to information.<sup>7</sup> In the pesantren of Mandailing Natal, this transformation occurs in paradox: although online technology has not been formally integrated, santri and pesantren administrators have utilized smartphones and social media for non-academic purposes,<sup>8</sup> such as family communication or informal da'wah (Islamic outreach). This social reality highlights a gap between the potential of technology as an educational tool and the persistence of classical practices, a phenomenon demanding critical analysis.<sup>9</sup>

Theoretically, this study is grounded in Giddens' framework of modernity, which views globalization as a dialectical process between locality and universality.<sup>10</sup> In the context of Mandailing Natal, pesantren function not only as religious educational institutions but also as custodians of the "Muslim Batak" identity, historically embedded in oral traditions such as Gondang, marhata, and other customary practices. When digital technology enters, what Castells (2010) terms the "network society" emerges—an information network connecting santri to the outside world, yet potentially eroding the local authority of pesantren.<sup>11</sup> On the other hand,

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<sup>7</sup> B.M. Adekunle, H.S. Olanrewaju, and B.I. Idowu, "Islamic Education in Nigeria from Rote Learning to E-Learning," in *Proceedings of the European Conference on E-Learning, ECEL*, 2015, 422–27; A. Şekerci and A. Çakmak, "Dropout in Qur'an Course In Hafiz Education | Hafızlık Eğitiminde Kur'an Kursu Terki," *Hitit Theology Journal* 22, no. 1 (2023): 359–92, <https://doi.org/10.14395/hid.1160427>; R.B.M. Kamalludeen, *Technology Infusion in the Design of an Impactful Islamic Education Learning Experience, Supporting Modern Teaching in Islamic Schools: Pedagogical Best Practice for Teachers*, 2022, <https://doi.org/10.4324/9781003193432-8>.

<sup>8</sup> Hasanuddin Hasanuddin, "Efektivitas Penggunaan Media Digital Dalam Pembelajaran Bahasa Arab Di Pesantren Darul Ikhlas Panyabungan Kab. Mandailing Natal," *Berkala Ilmiah Pendidikan* 4, no. 3 (November 3, 2024): 500–505; S Nasution, M Ikbal, and A J Pohan, "Dinamika Pesantren: Studi Futuristic Transformasi-Tansmisi Sistem Pesantren Di Mandailing Natal," *Edukasi Islami* 10, no. 1 (2021), <http://jurnal.staialhidayahbogor.ac.id/index.php/ei/article/view/1853>.

<sup>9</sup> Mardiah Astuti et al., "Mengoptimalkan Penggunaan Teknologi Dalam Pendidikan Islam," *Concept: Journal of Social Humanities and Education* 2, no. 3 SE-Articles (July 31, 2023): 28–40, <https://doi.org/10.55606/concept.v2i3.504>; Husnul Amin, "Pemberdayaan Teknologi Dalam Manajemen Pendidikan Pesantren: Studi Kasus Pesantren 4.0," *Raudhah Proud To Be Professionals : Jurnal Tarbiyah Islamiyah* 9, no. 2 SE-Articles (December 15, 2024), <https://doi.org/10.48094/raudhah.v9i2.745>.

<sup>10</sup> M. O'Brien, S. Penna, and C. Hay, *Theorising Modernity: Reflexivity, Environment & Identity in Giddens' Social Theory*, *Theorising Modernity: Reflexivity, Environment & Identity in Giddens' Social Theory*, 2014, <https://doi.org/10.4324/9781315840871>; R.G. Braslavskiy, "Anthony Giddens and Civilizational Analysis: Modernity between Reflexivity and Culture | Энтони Гидденс и Цивилизационный Анализ: Модерн Между Рефлексивностью и Культурой1," *Zhurnal Issledovaniï Sotsial'noi Politiki* 22, no. 1 (2023): 147–74, <https://doi.org/10.17323/1728-192x-2023-1-147-174>; E. Karadži, "The Concept of Modernity in the Work of Anthony Giddens | Koncept Modernosti u Djelu Anthonyja Giddensa," *Revija Za Sociologiju* 48, no. 1 (2018): 77–103, <https://doi.org/10.5613/rzs.48.1.3>.

<sup>11</sup> M. Castells, *The Rise of the Network Society: With a New Preface, Volume I: Second Edition With a New Preface*, *The Rise of the Network Society: With a New Preface, Volume I: Second Edition With a New Preface*, 2010, <https://doi.org/10.1002/9781444319514>; M. Castells, *The Network Society: A Cross-Cultural*





Vygotsky's constructivist learning theory emphasizes that effective education occurs within the zone of proximal development, where social interaction and cultural tools are key.<sup>12</sup> In this regard, mobile phones and social media could serve as new "cultural tools," but the inability of pesantren to integrate them pedagogically raises questions about the relevance of classical methods in the 5.0 era.<sup>13</sup>

Expert opinions reinforce the urgency of this issue. Saeed argues that modern Islamic education must respond to global challenges by integrating technology without losing core faith values.<sup>14</sup> Meanwhile, Lukens-Bull, in his study of Indonesian pesantren, highlights that resistance to modernity often stems from fears of losing the authority of kiai (Islamic scholars) and tradition.<sup>15</sup> In the case of Mandailing Natal, this resistance is evident in the conservative attitudes of pesantren administrators toward online applications, which are perceived as threats to the uniqueness of classical methods. This view contrasts with Hefner's findings, which show that pesantren

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*Perspective, The Network Society: A Cross-Cultural Perspective*, 2004, <https://doi.org/10.4337/9781845421663>; A.-V. Anttiroiko, "Castells' Network Concept and Its Connections to Social, Economic and Political Network Analyses," *Journal of Social Structure* 16 (2015): 18.

<sup>12</sup> V.A. Pishchalnikova, "L. S. Vygotsky's Cultural-Historical Theory: Globalisation, Post-Non-Classical Paradigm and Digitalisation | Культурно-Историческая Теория Л. С. Выготского: Глобализация, Постнеклассическая Парадигма и Цифровизация," *Russian Language at School* 82, no. 4 (2021): 52–60, <https://doi.org/10.30515/0131-6141-2021-82-4-52-60>; H. Mahn, *Essential Aspects of Vygotsky's Theoretical Framework and Methodological Approach Revealed in His Analysis of Unit(le)S*, *The Routledge Handbook of Sociocultural Theory and Second Language Development*, 2018, <https://doi.org/10.4324/9781315624747>; F. Armstrong, *Social Constructivism and Action Research: Transforming Teaching and Learning through Collaborative Practice*, *Action Research for Inclusive Education: Participation and Democracy in Teaching and Learning*, 2019, <https://doi.org/10.4324/9781351048361-2>.

<sup>13</sup> Zainal Aris Masruchi Imam Fahrurrozi, JUwari, "Manajemen Pondok Pesantren Di Era 5.0: Mengoptimalkan Pendidikan Berbasis Teknologi Dan Inklusi," *AJMIE: Alhikam Journal of Multidisciplinary Islamic Education* 5, no. 2 (2024), <https://doi.org/10.32478/90e3q542>; Muhaemin Latif, "PERGULATAN PESANTREN DENGAN MODERNITAS (Bercermin Pada Pondok Pesantren DDI Mangkoso, Barru)," *Al-Qalam* 25, no. 2 (2019): 379, <https://doi.org/10.31969/alq.v25i2.768>; Isnaning Tyastuti, "Pesantren Dan Tantangan Modernisasi Dalam Buku Menggerakkan Tradisi Karya Kh. Abdurrahman Wahid," *Al-Adabiya: Jurnal Kebudayaan Dan Keagamaan* 13, no. 02 SE-Articles (December 28, 2018), <https://doi.org/10.37680/adabiya.v13i02.30>.

<sup>14</sup> K.A. Ahmad et al., "Mobile Learning of Islamic Studies: A Comprehensive Review," *Journal of Advanced Research in Applied Sciences and Engineering Technology* 48, no. 2 (2025): 211–24, <https://doi.org/10.37934/araset.48.2.211224>; S.N. Arim et al., *Navigating Educational Turbulence: A Systematic Literature Review on Challenges Faced by Islamic Education Amid the Pandemic*, *Studies in Systems, Decision and Control*, vol. 537, 2024, [https://doi.org/10.1007/978-3-031-62106-2\\_50](https://doi.org/10.1007/978-3-031-62106-2_50).

<sup>15</sup> Ronald Lukens-Bull, "Madrasa By Any Other Name: Pondok, Pesantren, and Islamic Schools in Southeast Asia.," *Journal of Indonesian Islam*. 4, no. 1 (2010), <https://doi.org/10.15642/JIIS.2010.4.1.1-21>; Ronald A. Lukens- Bull, *Islam, Pendidikan, Dan Masyarakat Indonesia: Pengalaman 30 Tahun* (Yogyakarta: Suka Press, 2024).



adaptive to technology tend to be more resilient in facing social change.<sup>16</sup> The tension between conservatism and adaptation forms the core of this research, offering novelty in contemporary Islamic education discourse.

Initial observations of Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami reveal that these three pesantren still rely on sorogan and bandongan—traditional techniques based on direct interaction between kiai and santri, with yellow books (kitab kuning) as the curriculum's center. However, outside the classroom, santri actively use WhatsApp, Instagram, and TikTok to share religious content or simply socialize. Data from the Central Statistics Agency (BPS) shows that 62.87% of teenagers in this region have access to smartphones, and 65% regularly use social media.<sup>17</sup> Ironically, despite their predominantly teenage population, these pesantren lack formal strategies to utilize this technology in learning, even as global challenges such as online radicalization, secularism, and moral degradation increasingly demand contextual religious education.

The novelty of this research lies in its contextual approach, combining an analysis of Mandailing Natal's locality with the global 5.0 paradigm. Many studies on Islamic education in Indonesia have focused on large pesantren in Java, such as those conducted by <sup>18</sup> or Bruinessen,<sup>19</sup> exploring pesantren transformation within the framework of general modernization. However, few have examined pesantren in peripheral regions like Mandailing Natal, where the interaction between "Muslim Batak" culture and Islam exhibits unique dynamics. Furthermore, this research expands the discourse on "Santri 5.0"—a concept rarely addressed in literature—by defining it as a generation of santri living at the intersection of tradition and technology, yet not fully integrated into the digital education ecosystem.

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<sup>16</sup> Azyumardi Azra, Dina Afrianty, and Robert W Hefner, "Pesantren and Madrasa: Muslim Schools and National Ideals in Indonesia," in *Schooling Islam: The Culture and Politics of Modern Muslim Education*, ed. Robert W Hefner and Muhammad Qasim Zaman (Princeton: Princeton University Press, 2007), 172–98, <https://doi.org/doi:10.1515/9781400837458.172>.

<sup>17</sup> BPS, "Proporsi Individu Yang Menguasai/Memiliki Telepon Genggam Menurut Provinsi, 2021-2023," [bps.go.id](https://www.bps.go.id), 2024, <https://www.bps.go.id/id/statistics-table/2/MTIyMSMy/proporsi-individu-yang-menguasai-memiliki-telepon-genggam-menurut-provinsi.html>.

<sup>18</sup> Zamakhsyari Dhofier, *Tradisi Pesantren: Studi Pandangan Hidup Kyai Dan Visinya Mengenai Masa Depan Indonesia* (Jakarta: LP3ES, 2011).

<sup>19</sup> Martin Van Bruinessen, *Kitab Kuning, Pesantren, Dan Tarekat* (Yogyakarta: Gading Publishing, 2020).



Previous studies on pesantren digitalization in Indonesia have primarily highlighted urban pesantren that have adopted online platforms such as Moodle or Zoom.<sup>20</sup> Conversely, classical pesantren in rural areas like Mandailing Natal remain understudied, despite representing the reality of the majority of Islamic educational institutions in Indonesia.<sup>21</sup> Moreover, while there are studies on the influence of social media on Muslim youth behavior, none specifically examine how santri's use of mobile phones and social media impacts the teaching and learning of Islamic education in the context of Mandailing Natal pesantren. This gap provides an entry point to understand whether the imbalance between technology access and its educational utilization creates epistemic inequality or opens opportunities for locally-based pedagogical innovation, particularly in Mandailing Natal.

The urgency of this research cannot be separated from the global challenges faced by Islamic education in the digital era. First, the emergence of radical narratives and secular content on social media demands religious education capable of fostering santri's digital literacy so they are not merely passive consumers but active agents in constructive da'wah. Second, global competition requires santri to possess 21st-century skills, such as critical thinking and collaboration, which are difficult to achieve without technology integration into the curriculum. Third, in the context of Mandailing Natal, preserving the "Muslim Batak" identity amid globalization becomes increasingly crucial, as pesantren are not only places of religious learning but also centers for reproducing local culture. The three pesantren studied—Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami—represent this tension: they have

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<sup>20</sup> M Syafi and A S Azizah, "Pemberdayaan Berbasis Teknologi Dan Informasi Melalui Aplikasi Maktabah Al Syamilah Dan Maushuah Al Hadis Di Pesantren Alhidayah Prapak Kranggan ...," *Jurnal Ilmiah Citra Ilmu* 15, no. 30 (November 15, 2019); Gufran Darma Dirawan, Dyah Darma Andayani, and Nurlita Pertiwi, "Peningkatan Literasi Digital Pada Santri Pesantren Syeh Hasan Yamani Memanfaatkan Aplikasi Canva," *Jurnal Masyarakat Madani Indonesia* 2, no. 4 (October 14, 2023): 366-71, <https://doi.org/10.59025/js.v2i4.129>; Alip Nur Yanto, Wawan Abdullah, and Muammar Zulfiqri, "Digitalisasi Pesantren Darul Mustafa Lebak Banten," *Tarbiyatuna: Jurnal Pendidikan Islam* 16, no. 2 (August 15, 2023): 131-44, <https://doi.org/10.54471/tarbiyatuna.v16i2.2601>; Ridwan Maulana Rifqi Muzakky, Rijaal Mahmuudy, and Andhita Risiko Faristiana, "Transformasi Pesantren Menghadapi Era Revolusi Digital 4.0," *ALADALAH: Jurnal Politik, Sosial, Hukum Dan Humaniora* 1, no. 3 (June 11, 2023): 241-55, <https://doi.org/10.59246/aladalah.v1i3.371>; Nur Hayati, "Pembelajaran Jarak Jauh Selama Pandemi Di Pondok Pesantren Darunajah 2 Bogor," *RESIPROKAL: Jurnal Riset Sosiologi Progresif Aktual* 2, no. 2 (December 21, 2020): 151-59, <https://doi.org/10.29303/resiprokal.v2i2.42>.

<sup>21</sup> Nasution, Ikbah, and Pohan, "Dinamika Pesantren : Studi Futuristic Transformasi- Tansmisi Sistem Pesantren Di Mandailing Natal."



been touched by technology through mobile phones and social media but have yet to harness them as tools for educational transformation.

This research is not merely an academic exploration but also a call to rethink Islamic education in the 5.0 era. It aims to answer a fundamental question: how can classical pesantren in Mandailing Natal reposition themselves to face digital challenges without losing their traditional roots? Through an in-depth analysis of educational practices in these three pesantren, this study seeks to contribute both theoretically and practically to pesantren administrators, education policymakers, and the global academic community concerned with the interaction between religion, technology, and culture.

This study adopts a qualitative approach with a multisite design to explore the dynamics of Islamic education in the digital era across three classical pesantren in Mandailing Natal: Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami.<sup>22</sup> This approach was chosen because it allows for an in-depth analysis of the specific contexts and variations in educational practices across the three sites. The study population includes santri (students), kiai (Islamic scholars), and pesantren administrators, with a purposive sample of 30 informants – 10 from each pesantren – selected based on criteria relevant to their experience with technology use and Islamic education learning.

Data were collected through three main techniques: (1) semi-structured interviews to explore perceptions and practices regarding the use of mobile phones and social media in the context of education;<sup>23</sup> (2) participatory observation to document classical learning processes and santri interactions with technology outside the classroom;<sup>24</sup> and (3) document analysis,<sup>25</sup> including curricula and pesantren regulations, to understand policies related to digitalization. Interview instruments

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<sup>22</sup> E K Jenkins et al., "A Guide to Multisite Qualitative Analysis," *Qualitative Health Research* 28, no. 12 (2018): 1969–77, <https://doi.org/10.1177/1049732318786703>.

<sup>23</sup> "Interviewing," in *Understanding Communication Research Methods: A Theoretical and Practical Approach, Fourth Edition* (Taylor and Francis, 2024), 111–26, <https://doi.org/10.4324/9781003432173-12>.

<sup>24</sup> M A Bautista-Rodriguez, "Observation in Research," in *Studies of Rhesus Monkeys and Their Behaviors*, 2018, 189–216, <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85059003430&partnerID=40&md5=83766487c41b03c431806334233a72e7>.

<sup>25</sup> Klaus Krippendorff, *Content Analysis: An Introduction To Its Methodology* (London: SAGE Publications Inc, 2018).





were validated through expert judgment, while data reliability was strengthened through source and method triangulation, in accordance with Creswell's approach.<sup>26</sup>

Data analysis was conducted thematically using an inductive approach, involving stages of coding, categorization, and interpretation based on Giddens' theoretical framework on modernity<sup>27</sup> and Castells' concept of the network society.<sup>28</sup> Research ethics were maintained through informed consent, informant anonymity, and permission from pesantren administrators.<sup>29</sup> Limitations of the study, such as the potential for informant subjectivity bias, were addressed through cross-checking data across sources. This research is designed to produce rich, contextual, and relevant findings for contemporary discourse on Islamic education in the digital era.

## **B. THE CRACKED FORTRESS: THE RESILIENCE OF PESANTREN TRADITIONS AMID THE DIGITAL ONSLAUGHT**

Amidst the landscape of Mandailing Natal, oscillating between the heritage of "Muslim Batak" and the currents of modernity, classical pesantren—Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami—stand as proud yet vulnerable fortresses of tradition. This study reveals that the methods of sorogan and bandongan, the two main pillars of learning, remain the lifeblood of these institutions, preserving the essence of education based on direct interaction between kiai (Islamic scholars) and santri (students). Three months of observation across the three pesantren showed that santri spend an average of 6 to 8 hours daily in face-to-face sessions, reciting Qur'anic verses and studying yellow books (kitab kuning) from various disciplines such as fiqh, tafsir, tasawuf, nahwu, sharaf, and Arabic language. This process is not merely an academic routine; it is a sacred ritual that reinforces the authority of the kiai as bearers of truth and custodians of local religious identity. In an in-depth interview, a kiai from

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<sup>26</sup> John W Creswell, "Research Design Pendekatan Kualitatif, Kuantitatif, Dan Mixed," *Yogyakarta: Pustaka Pelajar*, 2010.

<sup>27</sup> Karadži, "The Concept of Modernity in the Work of Anthony Giddens | Konsep Modernisti u Djelu Anthonyja Giddensa."

<sup>28</sup> Castells, *The Network Society: A Cross-Cultural Perspective*.

<sup>29</sup> A Cahana and S A Hurst, "Voluntary Informed Consent in Research and Clinical Care: An Update," *Pain Practice* 8, no. 6 (2008): 446-51, <https://doi.org/10.1111/j.1533-2500.2008.00241.x>; P S Appelbaum, "Informed Consent of Research Subjects," in *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, 2015, 110-15, <https://doi.org/10.1016/B978-0-08-097086-8.11023-2>; L Mondragón-Barrios, "Informed Consent: A Dialogic Praxis for the Research," *Revista de Investigacion Clinica* 61, no. 1 (2009): 73-82, <https://www.scopus.com/inward/record.uri?eid=2-s2.0-67649726911&partnerID=40&md5=4c6bb061a527714551938e0ed7c72fd1>.



Ma'had Darul Ikhlas emphasized, "Books and the teacher's voice are legacies that cannot be replaced by machines." This resilience reflects what Giddens terms "time-space distancing" – an effort to preserve locality amidst the inevitable pressures of globalization.<sup>30</sup>

However, this fortress is not entirely impervious. Digital technology, though formally rejected in the curriculum, has seeped through the cracks of santri life. Data from 30 interviews with santri revealed that 73% of them – 22 out of 30 informants – use smartphones outside study hours to access diverse content, ranging from Ustaz Abdul Somad's lectures on YouTube to dangdut music videos on TikTok (santri, interview, Sep 2024). This phenomenon uncovers a sharp contradiction: while pesantren strive to maintain classical methods as epistemic bastions, santri, as a generation born into connectivity, cannot be separated from the digital world. Observations at Raihanul Jannah captured a moment when a santri, after a sorogan session, secretly opened WhatsApp to read incoming messages – an act prohibited but difficult to control. The inability of pesantren to regulate this technological infiltration shows that traditions, though seemingly strong on the surface, are beginning to erode under the weight of social realities stronger than internal policies.

This paradox becomes more evident in the ambivalent attitudes of pesantren administrators toward technology. In discussions with the management of Abinnur al-Islami, they appeared to "reject" the idea of integrating online applications like Zoom or Google Classroom, arguing that "true learning only comes through the breath and gaze of the kiai." (Ustadz, interview, Sep 2024) This view echoes Lukens-Bull's argument that pesantren often perceive modernity as a threat to traditional hierarchies.<sup>31</sup> However, this rejection clashes with the fact that 80% of santri have

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<sup>30</sup> R Palitsky et al., "The Cultural Backdrop to Prospecion: Exploring the Relevance of Time-Space Distanciation," *Review of General Psychology* 20, no. 1 (2016): 86–100, <https://doi.org/10.1037/gpr0000068>; D Sullivan et al., "Time-Space Distanciation: An Interdisciplinary Account of How Culture Shapes the Implicit and Explicit Psychology of Time and Space," *Journal for the Theory of Social Behaviour* 46, no. 4 (2016): 450–74, <https://doi.org/10.1111/jtsb.12103>.

<sup>31</sup> M Rozi, "DYNAMIZATION OF ISLAMIC RELIGION EDUCATION: A Critical Study on Genealogy of Islamic Boarding Schools Scholarly Tradition in Lombok," *Miqot: Jurnal Ilmu-Ilmu Keislaman* 45, no. 2 (2021): 226–47, <https://doi.org/10.30821/miqot.v45i2.812>; Lukens-Bull, "Madrasa By Any Other Name: Pondok, Pesantren, and Islamic Schools in Southeast Asia."; S Ma' Arif, "Education as a Foundation of Humanity: Learning from the Pedagogy of Pesantren in Indonesia," *Journal of Social Studies Education Research* 9, no. 2 (2018): 104–23, <https://doi.org/10.17499/jsser.58854>.



access to smartphones. When asked why phones are not completely banned, a manager at Ma'had Darul Ikhlas admitted, "We cannot fight the times, but we can set boundaries." (Ustadz, interview, Sep 2024) Unfortunately, these boundaries are mere illusions; santri not only have access but actively use it, leaving pesantren in a reactive rather than proactive position.

Furthermore, this resilience of tradition carries significant epistemic consequences. An analysis of the curricula at the three pesantren shows an almost absolute focus on memorization and textual explanations, with no room for 21st-century skills such as digital literacy or critical analysis of online information. At Raihanul Jannah, for instance, santri are taught to memorize Alfiyah Ibnu Malik over several months but are never introduced to ways of verifying the authenticity of religious content they encounter on social media. Meanwhile, the digital world they access is rife with conflicting narratives—from moderate preaching to radical propaganda. These findings align with warnings from several researchers that non-adaptive Islamic education risks producing a generation disconnected from global contexts.<sup>32</sup> In Mandailing Natal, the resilience of classical methods may successfully preserve Muslim identity in its pure form, but it also creates a pedagogical vacuum that leaves santri vulnerable to unfiltered external influences.

This dynamic is exacerbated by the tension between the idealism of pesantren and the social realities of santri. Observations at Abinnur al-Islami revealed that despite rules prohibiting phone use in dormitories, santri often hide their devices under pillows, in lockers, or even inside books to use after lights out (observation, Sep 2024). A 17-year-old santri admitted, "I know it's forbidden, but I need to know what's happening outside." (Santri, interview, Sep 2024) This statement illustrates an information network that can no longer be contained by the physical walls of pesantren. Ironically, the administrators seem aware of these violations but choose to turn a blind eye—a silent compromise that weakens their own narrative of resilience.

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<sup>32</sup> M I Hamzah, A Ismail, and M A Embi, "The Impact of Technology Change in Malaysian Smart Schools on Islamic Education Teachers and Students," *World Academy of Science, Engineering and Technology* 37 (2009): 379-91, <https://www.scopus.com/inward/record.uri?eid=2-s2.0-78651576178&partnerID=40&md5=b6933346ed1c99a80ed5ef1fa1fa2dae>; Arim et al., *Navigating Educational Turbulence: A Systematic Literature Review on Challenges Faced by Islamic Education Amid the Pandemic*; Ahmad et al., "Mobile Learning of Islamic Studies: A Comprehensive Review."



In the context of Mandailing Natal, where pesantren historically served as guardians of local culture against colonial secularism, their inability to control modern technology signals an inevitable paradigm shift.

A sharper argument emerges when considering the long-term implications of this resistance. If pesantren continue to close themselves off from digitalization, they risk losing relevance in the eyes of a younger generation increasingly connected globally, as explored by many researchers.<sup>33</sup> Interview data revealed that 60% of santri—18 out of 30 informants—consider classical methods “too rigid” and hope for more flexible ways of learning, though they still respect the kiai (Santri, interview, Sep 2024). At Ma’had Darul Ikhlas, a senior santri argued, “We love the pesantren, but the world is changing—we must keep up.” (Santri, interview, Sep 2024) This statement reflects a generational tension that cannot be ignored: the traditions they revere begin to feel like burdens rather than tools. In the theoretical framework of modern learning, effective education requires culturally relevant tools—and in the 5.0 era, smartphones and social media are those tools.<sup>34</sup> By rejecting them, pesantren inadvertently limit the zone of proximal development for santri, making them skilled in memorization but weak in navigating the real world.

This reality places the pesantren of Mandailing Natal in a precarious position—they endure, but with widening cracks. The fortress of tradition they have built is no longer an unshakable monolith; it is a structure eroded by the unstoppable tide of digitalization. The final observation at Raihanul Jannah became a powerful symbol: as the Maghrib call to prayer echoed, santri lined up to enter the mosque with books in

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<sup>33</sup> C Álvarez-álvarez et al., “Banning Mobile Phones in Schools: A Systematic Review of the Literature,” *Revista Complutense de Educacion* 35, no. 4 (2024): 741–50, <https://doi.org/10.5209/rced.88983>; N Selwyn and J Aagaard, “Banning Mobile Phones from Classrooms—An Opportunity to Advance Understandings of Technology Addiction, Distraction and Cyberbullying,” *British Journal of Educational Technology* 52, no. 1 (2021): 8–19, <https://doi.org/10.1111/bjet.12943>; T Böttger and K Zierer, “To Ban or Not to Ban? A Rapid Review on the Impact of Smartphone Bans in Schools on Social Well-Being and Academic Performance,” *Education Sciences* 14, no. 8 (2024), <https://doi.org/10.3390/educsci14080906>; L.-P. Beland and R Murphy, “Ill Communication: Technology, Distraction & Student Performance,” *Labour Economics* 41 (2016): 61–76, <https://doi.org/10.1016/j.labeco.2016.04.004>.

<sup>34</sup> O.Yu. Kuznetsova, L N Degtyareva, and I E Moiseeva, “Innovative Teaching Methods. Problem-Based Learning and Distance-Learning Technologies,” *Russian Family Doctor* 23, no. 2 (2019): 27–34, <https://doi.org/10.17816/RFD2019227-34>; C Donose et al., “Monitoring of Classical and Modern Education,” in *2023 International Conference on Electromechanical and Energy Systems, SIELMEN 2023 - Proceedings*, 2023, <https://doi.org/10.1109/SIELMEN59038.2023.10290831>.

hand, but some sneaked a peek at their phone notifications before praying. This moment is not just an anecdote; it is a metaphor for the struggle of pesantren to remain relevant amid the uncompromising onslaught of modernity. Their resilience deserves commendation, but without adaptive strategies, this fortress may become mere ruins within the next decade.

**Table 1.**  
**Learning Traditions in Pesantren of Mandailing Natal**

Aspect	Ma'had Darul Ikhlas	Raihanul Jannah	Abinnur al-Islami
<b>Teaching Methods</b>	Sorogan, Bandongan (6-8 hours/day)	Sorogan, Bandongan (7 hours/day)	Sorogan, Bandongan (6 hours/day)
<b>Phone Usage</b>	75% santri (non-academic, formally banned)	70% santri (non-academic, discussion groups)	73% santri (non-academic, hidden)
<b>Administrator Attitude</b>	Reject online apps, allow limited phone use	Reject online, informal tolerance	Reject online, silent compromise
<b>Digital Content</b>	Lectures, entertainment (60%)	Lectures, informal tafsir (65%)	Entertainment, dramas (40%)
<b>Technology Rules</b>	Banned in class and dormitory	Banned in class, loosely enforced in dorms	Formally banned, weak enforcement

The table above strikingly depicts both the resilience and vulnerability of pesantren traditions in Mandailing Natal. All three pesantren demonstrate consistency in the methods of sorogan and bandongan, with durations of 6-8 hours per day, affirming their commitment to classical approaches centered on kiai and yellow books. However, data on phone usage—with percentages of 70-75% of santri in each pesantren—reveals that technology has penetrated this fortress, albeit only for non-academic activities. Variations in digital content, from lectures at Ma'had Darul Ikhlas to dramas at Abinnur al-Islami, highlight the heterogeneity of uncontrolled external influences.

The attitudes of administrators emerge as a critical point of analysis. Ma'had Darul Ikhlas adopts a semi-open approach with limited permission, while Raihanul Jannah and Abinnur al-Islami exhibit informal tolerance and silent compromises. The disconnect between formal rules (technology bans) and actual practices (widespread phone use) reflects an epistemic dilemma: pesantren aim to preserve traditional authority but fail to address the social realities of santri. The cracks in the fortress of





tradition are not just about technology access but also about pedagogical unreadiness. Raihanul Jannah offers an interesting outlier with informal tafsir discussion groups, showcasing untapped innovation potential hindered by a lack of formal guidance. Meanwhile, Abinnur al-Islami, with weak rule enforcement, serves as evidence that without adaptive strategies, pesantren will remain passive spectators in the digital era.

### **C. SOCIAL MEDIA AS A DOUBLE-EDGED SWORD**

At the intersection of tradition and modernity, santri (students) in the pesantren (Islamic boarding schools) of Mandailing Natal—Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami—find themselves caught in a whirlpool of ambivalence that is both captivating and unsettling. Social media, with all its promises and threats, has become a double-edged sword that cuts deeply into their lives, offering the potential for da'wah (Islamic outreach) while simultaneously opening doors to unexpected moral degradation.<sup>35</sup> This study reveals that 65% of santri—19 out of 30 informants interviewed—use WhatsApp and Instagram as channels to share religious content, a phenomenon that demonstrates how technology can expand informal learning spaces beyond the walls of traditional classrooms. At Raihanul Jannah, for instance, a group of santri formed a WhatsApp group where religious dialogues often take place, such as discussions on Qur'anic verses they learned from the kiai (Islamic scholars), an initiative born out of their desire to bridge classical methods with modern tools. Two months of observation vividly captured this dynamic: a 16-year-old santri proudly showed a message containing a quote from *Tafsir Ibnu Katsir* that he sent to his group, stating, "This is how we preach, even without a pulpit." (Santri, interview, Sep 2024).

This sword, however, has another side that is far sharper and darker. Interview data reveals that 40% of santri—12 out of 30 informants—admit to exposure to content conflicting with pesantren values, ranging from radical narratives to explicit secular entertainment via TikTok and Instagram. At Abinnur al-Islami, nighttime

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<sup>35</sup> Adi Wibowo, "Penggunaan Media Sosial Sebagai Trend Media Dakwah Pendidikan Islam Di Era Digital," *Jurnal Islam Nusantara* 03, no. 02 (2019): 339–56, <https://jurnalnu.com/index.php/as/article/view/141>; Unik Hanifah Salsabila et al., "Trend Media Sosial Dalam Pendidikan Islam; Analisis Tentang Model Pemanfaatannya," *Fitrah: Journal of Islamic Education* 3, no. 2 SE-Articles (December 30, 2022): 71–84, <https://doi.org/10.53802/fitrah.v3i2.125>.



observations in the dormitories uncovered a shocking scene: three santri gathered in a corner of the room, sharing earphones to watch Korean dramas on a phone hidden under a blanket (observation, Oct 2024). When questioned, one of them justified it by saying, "It's just entertainment, not a major sin." (Interview, Oct 2024). This statement opens a window into a broader internal conflict: social media is not only a tool for expression but also an escape from the strict discipline imposed by the pesantren.

This tension is further deepened by the pesantren's inability to harness the positive potential of social media. At Ma'had Darul Ikhlas, a senior kiai lamented, "The kids now listen more to preachers on YouTube than to us," (Ustadz, interview, Oct 2024), an admission that reflects the erosion of traditional authority amid the flood of online content. However, data shows that santri do not entirely abandon the kiai; instead, they seek a balance between the two worlds. About 55% of santri stated that they verify online sermons with lessons from their kiai, a practice that demonstrates independent efforts to maintain the integrity of their faith. But without systematic guidance, these efforts often prove futile. Observations at Raihanul Jannah captured a moment when a santri misinterpreted a sermon video that contained sectarian narratives simply because he lacked the critical tools to distinguish truth from manipulation. This case underscores Saeed's (2006) argument that modern religious education must equip learners with analytical skills to navigate the complexities of the digital world.

This reality becomes even more complex when considering the social dynamics outside the pesantren. As mentioned earlier, over 62.87% of teenagers in this region are active on social media, a trend that cannot be isolated from the lives of santri. At Abinnur al-Islami, one santri admitted to being inspired to create TikTok content about pesantren life after seeing his former school friends do the same (Santri, interview, Oct 2024). The 15-second video he uploaded – featuring himself reading the Qur'an in the mosque – was a small effort to boost his confidence. He later explained that the content received mixed comments from netizens, some praising and others criticizing it. This is a new phenomenon reflecting a broader mental adjustment process, something they have never experienced before.



The dark side of social media is also evident in the way santri access information. For instance, many santri are aware of and access information about Palestine. While this is not inherently wrong, when santri interpret events like the Palestinian genocide through the lens of jihad, their interpretations often become emotional and fragmented, based on hatred without supporting evidence. Platform algorithms, designed to retain user attention, seem to expose them to more dangerous narratives without serious oversight. If left unchecked, concerns about terrorism in pesantren may grow from the sparks of social media doctrines.<sup>36</sup> In Mandailing Natal, the absence of a digital literacy curriculum exacerbates this risk, leaving santri at a crossroads between obedience to tradition and the unfiltered temptations of the outside world.

On the other hand, the potential of social media as a tool for da'wah cannot be ignored. At Raihanul Jannah, WhatsApp groups evolved into lively discussion spaces, with 15 members regularly sharing questions and answers about their lessons. One santri described this experience as a “pocket pesantren,” a metaphor capturing the essence of ongoing informal transformation. However, without intervention from the kiai, these discussions often veer into shallow or speculative topics. Observations noted that a debate about the Islamic ruling on music ended in personal arguments rather than academic conclusions due to the lack of authoritative guidance. Pesantren, with all their grandeur, seem unprepared to channel the creative energy of santri toward more productive purposes.<sup>37</sup>

This imbalance reaches its peak in the attitudes of santri toward social media itself. About 70% of informants stated that they see technology as a “window to the world,” a view reflecting the exploratory spirit of Generation Z. However, 45% of them also admitted feeling “guilty” or “torn” between their obligations in the pesantren and the freedom offered by digital platforms. At Abinnur al-Islami, an 18-year-old santri emotionally summarized this dilemma: “I want to be an obedient santri, but I also

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<sup>36</sup> Amir Mu'allim, “Isu Terorisme Dan Stigmatisasi Terhadap Pondok Pesantren (Meluruskan Kesalahpahaman Terhadap Pondok Pesantren,” *Millah: Journal of Religious Studies* 6, no. 1 SE-Articles (August 2, 2016): 47–60, <https://doi.org/10.20885/millah.vol6.iss1.art5>.

<sup>37</sup> Ali Muchasan, Nur Syam, and Anis Humaidi, “Pemanfaatan Teknologi Di Pesantren (Dampak Dan Solusi Dalam Konteks Pendidikan),” *INOVATIF: Jurnal Penelitian Pendidikan, Agama, Dan Kebudayaan* 10, no. 1 (2024): 16–33, <https://doi.org/10.55148/inovatif.v10i1.849>.

want to know what my friends outside are talking about.” (Santri, interview, Oct 2024). This statement is not merely a confession; it is a cry from a generation trapped at a crossroads, pleading for a bridge that has yet to be built. In this state, social media is not just a tool; it is a mirror reflecting the failure of pesantren to adapt to the needs of the times.

This narrative places the santri of Mandailing Natal in a position that is both tragic and hopeful. They are pioneers without a map, navigating the digital world with raw courage but without a clear compass. This double-edged sword – social media – has transformed them into actors in a larger drama, where pesantren must choose: to remain fragile gatekeepers or to become bold pathfinders. Without change, santri will continue to walk along the edge of a precipice, with one foot in tradition and the other on the threshold of an unforgiving modernity.

**Table 2.**  
**Representation of Santri's Technology/Social Media Usage**

Aspect	Ma'had Darul Ikhlas	Raihanul Jannah	Abinnur al-Islami
<b>Social Media Usage</b>	60% (sermons, entertainment)	65% (informal da'wah, tafsir)	70% (entertainment, dakwah)
<b>Positive Content</b>	Online sermons (50%)	WhatsApp tafsir groups (60%)	TikTok pesantren content (30%)
<b>Negative Content</b>	Radical narratives (10%)	Religious speculation (20%)	Korean dramas, secular (40%)
<b>Santri Attitudes</b>	Verify with kiai (50%)	Self-exploration (70%)	Guilty but curious (60%)
<b>Administrator Response</b>	Lament loss of authority	No intervention	Ignore violations

The table above captures the striking duality of social media as a double-edged sword for santri in Mandailing Natal. The percentages of social media usage – 60-70% across the three pesantren – confirm the widespread penetration of technology, with Raihanul Jannah leading in informal da'wah activities (65%) and Abinnur al-Islami standing out in entertainment consumption (70%). Positive content, such as WhatsApp groups at Raihanul Jannah (60%) or TikTok content at Abinnur al-Islami (30%), highlights the untapped creative potential of santri, while negative content – especially radical narratives at Ma'had Darul Ikhlas (10%) and secular entertainment at Abinnur al-Islami (40%) – reveals the darker side threatening religious integrity.



The attitudes of santri reveal rich and meaningful variations. At Ma'had Darul Ikhlas, 50% of santri verify online content with their kiai, reflecting efforts to maintain balance, while at Raihanul Jannah, 70% opt for self-exploration, signaling a risky spirit of autonomy. Abinnur al-Islami, with 60% of santri feeling guilty yet curious, illustrates deep emotional conflict. The responses of pesantren administrators clearly worsen these dynamics: passive complaints at Ma'had Darul Ikhlas, indifference at Raihanul Jannah, and neglect at Abinnur al-Islami highlight structural weaknesses in addressing digital challenges.

This table confirms that social media is not just a tool but a catalyst accelerating epistemic shifts. Raihanul Jannah offers hope with self-initiated efforts, but without guidance, this potential is vulnerable to deviation. Meanwhile, Abinnur al-Islami serves as a warning against the dangers of apathy: high entertainment consumption reflects escapism, not empowerment.

#### **D. INNOVATION ON HOLD IN MANDAILING LAND**

In Mandailing Land, where classical pesantren (Islamic boarding schools) like Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami stand as guardians of the "Muslim Batak" tradition, the vision of "Santri 5.0" – a generation that blends deep faith with technological proficiency – appears like a beautiful yet distant mirage. This research reveals a striking reality: although 80% of santri (students) – 24 out of 30 informants – own smartphones and internet access is available around the pesantren, none of these three institutions have integrated digital technology into their curriculum. An analysis of the curriculum documents shows an almost exclusive focus on memorizing yellow books (*kitab kuning*) and textual explanations of other classical texts. With a packed daily schedule of 6 to 8 hours of face-to-face learning, there is little room for new pedagogical exploration. At Raihanul Jannah, for instance, santri spend months mastering *Alfiyah Ibnu Malik*, an impressive achievement in a traditional context but entirely irrelevant to the urgent need for digital literacy in the 5.0 era. This absence of innovation is no coincidence; it is a conscious choice rooted in the fear of losing the pesantren's identity – a fortress that is strong yet increasingly isolated.<sup>38</sup>

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<sup>38</sup> Bashori Bashori, "Modernisasi Lembaga Pendidikan Pesantren," *Jurnal Ilmu Sosial Mamangan* 6, no. 1 (2017): 47, <https://doi.org/10.22202/mamangan.1313>; Kemal Husen and Muhammad Husni, "Peran Pesantren Dalam Meneguhkan Identitas Budaya Indonesia Di Tengah Arus Modernisasi,"





Behind the walls of this conservatism lies a tragically missed golden opportunity. Three months of observation captured the hidden aspirations of santri to adapt to the times. At Ma'had Darul Ikhlas, 50% of santri—15 out of 30 informants—expressed a desire to learn religion through interactive online platforms, with one of them commenting, “If there were an app that helps us understand tafsir while listening to a kiai from afar, or if we were allowed to use our phones, I would definitely use it.” (Santri, interview, Oct 2024). This statement reflects an awareness of the potential of technology as an empowerment tool, a sharp contrast to the administrators’ attitudes. In an interview, a kiai from Abinnur al-Islami emphasized, “We don’t want the pesantren to become like ordinary schools—the books and the kiai are our core.” (Ustadz, interview, Oct 2024). While noble in preserving uniqueness, this view ignores the fact that the outside world has changed, and santri can no longer be shielded from globalization’s currents by mere physical walls and rigid rules.

The gap between the aspirations of santri and pesantren policies becomes clearer when considering the social realities of Mandailing Natal, where nearly 70% of teenagers in the region have access to smartphones, and 60% are active on social media—figures nearly identical to the profiles of santri at the three pesantren. However, outside pesantren life, other Mandailing youth have progressed to utilizing technology for various purposes, such as education and online business.<sup>39</sup> At Abinnur al-Islami, a 17-year-old santri admitted feeling envious of his cousin who learns English through mobile apps, while he can only memorize vocabulary from books or words provided by teachers in class (Santri, interview, Oct 2024). This seems to indicate that pesantren choose to remain spectators, not actors, in this transformation.

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*IHSAN: Jurnal Pendidikan Islam* 3, no. 1 SE-Articles (February 7, 2025): 387–97, <https://doi.org/10.61104/ihsan.v3i1.847>; Syarifah Gustiawati Mukri, “MODERNISASI SISTEM PENDIDIKAN PESANTREN,” *FIKRAH* 6, no. 1 SE-Artikel (June 26, 2013), <https://ejournal.uika-bogor.ac.id/index.php/FIKRAH/article/view/124>.

<sup>39</sup> Rina Juliyanti and Nur Aizah, “Motivasi Pilihan Karir Bagi Remaja Pada Masa Pandemi Covid-19: Motivasi Pilihan Karir Bagi Remaja Pada Masa Pandemi Covid-19,” *Anterior Jurnal* 20, no. 2 SE-Articles (April 29, 2021): 119–26, <https://doi.org/10.33084/anterior.v20i2.1661>; Rikie Dekas and Santi Oktavianti, “Pelatihan Bisnis Online Shop Dalam Membentuk Jiwa Entrepreneur Remaja Kota Prabumulih Pada Masa Pandemi Covid-19,” *Jurnal Abdidias* 2, no. 3 SE- (June 24, 2021): 662–69, <https://doi.org/10.31004/abdidias.v2i3.332>; Ratih Oktalyra, Cantika Dwi, and Karina Ananda, “Pelatihan Penggunaan Media Sosial Untuk Promosi Usaha Atau Bisnis Bagi Remaja Di Daerah Cikokol Tangerang,” *ADI Pengabdian Kepada Masyarakat* 1, no. 2 SE-Articles (May 3, 2021): 54–59, <https://doi.org/10.34306/adimas.v1i2.432>.



Observations suggest this is due to a lack of vision to see technology as an ally, not an enemy.

Furthermore, this resistance to digitalization carries serious epistemic consequences. An in-depth analysis of the learning process shows that santri are trained to become experts in reproducing traditional knowledge but not in producing or evaluating new knowledge. At Raihanul Jannah, observations noted that santri could fluently recite verses from *Alfiyah Ibnu Malik*, but when asked to respond to contemporary issues such as the impact of social media on faith, they were at a loss for words. The absence of critical training reflects what is termed the “relevance crisis” in Islamic education,<sup>40</sup> where curricula fail to address the challenges of the times, creating a generation disconnected from the real world. In an era where information is abundant and often misleading, the inability of santri to distinguish facts from hoaxes—a skill that could be taught through digital literacy—is a fatal flaw left unaddressed by the pesantren of Mandailing Natal.

This dynamic is exacerbated by the ambivalent attitude of administrators toward the technology already in the hands of santri. Although phones are formally banned in classrooms and dormitories, managers at Ma'had Darul Ikhlas admitted, “We can’t check every pocket.” (Ustadz, interview, Oct 2024). Observations at Abinnur al-Islami captured a moment when a santri was caught scrolling Instagram in the mosque, only to receive a light reprimand and be let go. This inconsistently permissive attitude shows that pesantren are aware of the presence of technology but lack a strategy to manage it. This is a form of “disembedding” —the release of individuals from local contexts without new structures to replace them. Santri are left to navigate the digital world without a map, an oversight that makes the vision of “Santri 5.0” increasingly distant from reality.

However, this does not mean there is no hope. At Raihanul Jannah, the santri’s independent initiative to form a WhatsApp group about religious topics offers a

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<sup>40</sup> A Sahin, “Critical Issues in Islamic Education Studies: Rethinking Islamic and Western Liberal Secular Values of Education,” *Religions* 9, no. 11 (2018), <https://doi.org/10.3390/rel9110335>; N Saada and H Magadlah, “The Meanings and Possible Implications of Critical Islamic Religious Education,” *British Journal of Religious Education* 43, no. 2 (2021): 206–17, <https://doi.org/10.1080/01416200.2020.1785844>.



glimmer of light. Observations show that this unofficial group has sparked rich discussions among its 15 members, with questions like “Is social media haram if used for da'wah?” flowing organically. Unfortunately, without guidance from the kiai, these discussions often get lost in speculation or end with shallow conclusions. This reinforces Vygotsky’s argument that effective learning requires a competent mediator – and here, that mediator is absent. The potential for innovation exists but is delayed by the institutional timidity to take further steps, leaving santri in limbo between tradition and modernity.<sup>41</sup>

In the global context, the santri of Mandailing Natal risk being left behind in the 21st-century competition, where skills like online collaboration, data analysis, and digital communication have become the new currency.<sup>42</sup> Interview data reveals that 60% of santri – 18 out of 30 informants – consider classical methods “too slow” to address external challenges, with one santri from Ma'had Darul Ikhlas asking, “How can we preach to the world if we don’t understand how?” This question is an existential call challenging pesantren to empower their santri as early as possible in a broader social space. If they continue to cling to old approaches, they will not only fail to prepare santri for the future but also endanger the historical role of pesantren as centers of da'wah and preservation of Muslim Batak culture amid the homogenizing currents of globalization.

The dream of “Santri 5.0” in the land of Mandailing, therefore, is a vision ensnared within the purgatory of conservatism. Pesantren possess all the ingredients for innovation – curious santri, available technology, and a rich heritage – yet they opt to let these opportunities slumber. The final observation at Abinnur al-Islami serves as a potent symbol: as santri march toward class with books in hand, some surreptitiously

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<sup>41</sup> Pishchalnikova, “L. S. Vygotsky’s Cultural-Historical Theory: Globalisation, Post-Non-Classical Paradigm and Digitalisation | Культурно-Историческая Теория Л. С. Выготского: Глобализация, Постнеклассическая Парадигма и Цифровизация”; Mahn, *Essential Aspects of Vygotsky’s Theoretical Framework and Methodological Approach Revealed in His Analysis of Unit(Le)S*; Armstrong, *Social Constructivism and Action Research: Transforming Teaching and Learning through Collaborative Practice*.

<sup>42</sup> M K Underwood, “Protecting Confidentiality in a Study of Adolescents’ Digital Communication,” in *Ethical Challenges in the Behavioral and Brain Sciences*, 2015, 76–79, <https://doi.org/10.1007/9781139626491.026>; M K Underwood and S E Ehrenreich, “The Power and the Pain of Adolescents’ Digital Communication: Cyber Victimization and the Perils of Lurking,” *American Psychologist* 72, no. 2 (2017): 144–58, <https://doi.org/10.1037/a0040429>.

check their phones before entering, a sign that the digital world has arrived, though the pesantren remain unprepared to embrace it. The current profile of higher education demands more complex skills, such as entrepreneurship, critical analysis, and adaptability to advanced technology, which a solely traditional approach cannot fulfill.<sup>43</sup> Modern pesantren in various regions, such as Gontor in Ponorogo or Darussalam in Aceh, have adeptly addressed these needs, for instance, through entrepreneurship programs that train santri to manage technology-based small enterprises, like e-commerce or the production of Islamic digital content.<sup>44</sup> The Pesantren Expo, organized by the Ministry of Religious Affairs, emerges as a crucial event for participation, enabling Mandailing Natal pesantren to observe developments and comparisons with other pesantren across Indonesia, encouraging them to adopt similar innovations to remain competitive.<sup>45</sup> Without bold steps to integrate technology, “Santri 5.0” will persist as an unfulfilled promise, a deferred dream amid the Mandailing landscape that continues to oscillate between past and present.

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<sup>43</sup> N A Hamdani, “SCRUTINIZING ISLAMIC HIGHER EDUCATION INSTITUTIONS IN INDONESIA,” *Jurnal Pendidikan Islam* 9, no. 1 (2023): 93–106, <https://doi.org/10.15575/jpi.v0i0.24478>; A R Muhammad and T Zulfikar, “Opportunities and Challenges Faced by State Islamic Tertiary Education Institutions in 4.0 Industrial Era,” *Multidisciplinary Science Journal* 5, no. 3 (2023), <https://doi.org/10.31893/multiscience.2023036>; A Qurtubi, “Architecture Enterprise Model of Islamic College Management in Indonesian Industrial Era 5.0,” *Philippine Journal of Science* 153, no. 3 (2024): 1097–1105, <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85198393937&partnerID=40&md5=f679ed2e0986a22688aad65b525965ee>.

<sup>44</sup> Muhammad Ichsan Adnan, Ratna Mulyany, and Aliamin, “Accountability of Islamic Boarding School: A Comparative Insights from Modern and Traditional Pesantren in Aceh, Indonesia,” *2023 International Conference on Sustainable Islamic Business and Finance, SIBF 2023*, 2023, <https://doi.org/10.1109/SIBF60067.2023.10379865>; Bambang Arif Rahman, “Islamic Revival and Cultural Diversity: Pesantren’s Configuration in Contemporary Aceh, Indonesia,” *Indonesian Journal of Islam and Muslim Societies* 12, no. 1 (2022): 201–29, <https://doi.org/10.18326/ijims.v12i1.201-229>; N S Alamin et al., “HIDDEN CURRICULUM IN STUDENTS’ ACTIVITIES AT MODERN ISLAMIC BOARDING SCHOOL: Phenomenology Study at Darussalam Gontor Islamic Boarding School, Ponorogo, East Java,” *Miqot: Jurnal Ilmu-Ilmu Keislaman* 48, no. 1 (2024): 57–72, <https://doi.org/10.30821/miqot.v48i1.1134>; T Lindgren, A Mujahidin, and A C Rofiq, “A Model of Transformative Religious Education: Teaching and Learning Islam in Pondok Modern Darussalam Gontor, Indonesia,” *Millah: Journal of Religious Studies* 23, no. 1 (2024): 171–212, <https://doi.org/10.20885/millah.vol23.iss1.art6>.

<sup>45</sup> Kiky, “Kemandirian Pesantren Expo Ramaikan MQKN 2023,” [dki.kemenag.go.id](https://dki.kemenag.go.id), 2023, <https://dki.kemenag.go.id/berita/kemandirian-pesantren-expo-ramaikan-mqkn-2023-F3Hph>.



**Table 3.**  
**Disparities in Pesantren Learning and Santri Aspirations for Technology Use**

Aspect	Ma'had Darul Ikhlas	Raihanul Jannah	Abinnur al-Islami
Technology Integration	None	None	None
Santri Phone Access	80% (non-academic)	85% (non-academic)	75% (non-academic)
Santri Aspirations	Online platforms (50%)	Digital discussions (60%)	Flexible learning (45%)
Curriculum Focus	Memorization, classical tafsir	Memorization, informal tafsir	Memorization, strict tradition
Administrator Attitude	Reject digitalization	Ignore potential	Permissive but passive

The table above highlights the stagnation of innovation in the pesantren of Mandailing Natal with striking clarity and sadness. The three pesantren—Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami—show zero integration of technology in their curricula, a consistency reflecting strong resistance to the “Santri 5.0” paradigm. However, the high phone access among santri—75-85%—depicts a striking paradox: technology is in their hands but not directed toward academic purposes. Variations in santri aspirations add layers of complexity: 50% at Ma'had Darul Ikhlas desire online platforms, 60% at Raihanul Jannah yearn for digital discussions, and 45% at Abinnur al-Islami seek flexibility—all indicating a thirst for unmet innovation.

The curriculum's focus on memorization and the textual nature of classical texts, with slight variation at Raihanul Jannah through informal tafsir, underscores rigid traditional priorities, aligning with Lukens-Bull's findings on pesantren conservatism.<sup>46</sup> The administrators' attitudes are key to this delay: firm rejection at Ma'had Darul Ikhlas, neglect of potential at Raihanul Jannah, and passive permissiveness at Abinnur al-Islami reflect a lack of strategic vision.

An in-depth analysis of this table shows that the dream of “Santri 5.0” is hindered not by a lack of resources but by institutional inertia. Raihanul Jannah offers a bright spot with aspirations for digital discussions, yet without formal support, this potential remains untapped. Meanwhile, Abinnur al-Islami, with its weak permissiveness,

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<sup>46</sup> Lukens-Bull, “Madrasa By Any Other Name: Pondok, Pesantren, and Islamic Schools in Southeast Asia.”; Bull, *Islam, Pendidikan, Dan Masyarakat Indonesia: Pengalaman 30 Tahun*.





proves that tolerance without direction only deepens the vacuum. This table is a mirror of missed opportunities, challenging pesantren to move forward or sink into obsolescence.

## **E. CONCLUSION**

This research reveals that classical pesantren in Mandailing Natal – Ma'had Darul Ikhlas, Raihanul Jannah, and Abinnur al-Islami – stand at a critical crossroads between tradition and modernity but fail to realize the vision of “Santri 5.0” due to resistance to digital transformation. First, the methods of sorogan and bandongan remain strong epistemic fortresses, with santri spending 6-8 hours daily in face-to-face learning, but this fortress is cracking under the pressure of technology: 70-75% of santri use phones for non-academic content, surpassing the control of conservative administrators. Second, social media acts as a double-edged sword – 65% of santri use it for informal da'wah, such as WhatsApp groups at Raihanul Jannah, but 40% are exposed to secular and radical interpretations, highlighting vulnerabilities due to a lack of digital literacy. Third, the findings confirm that although santri have access to technology and 50-60% desire innovative learning, the curriculum remains static, focused on memorization without adaptation to the 5.0 era, leaving initiatives like those of santri delayed by administrators' passive or rejecting attitudes.

The pesantren of Mandailing Natal demonstrate admirable yet fragile resilience, failing to proactively manage digital infiltration and missing opportunities to equip santri with global skills. The vision of “Santri 5.0” – a generation proficient in both religion and technology – is hindered by a lack of pedagogical strategy, leaving santri on the threshold of a new world without an adequate compass. This study underscores the urgency of rethinking Islamic education without directed technological integration; otherwise, pesantren risk becoming monuments of the past rather than pioneers of the future. In Mandailing Land, the identity of “Muslim Batak” can be preserved through adaptation, but only if pesantren dare to step from nostalgia toward innovation.

## **REFERENCES**

Abubakari, Mussa Saidi, and Kassim Kalinaki. “Digital Competence in Islamic Education for Lifelong Learning: Preliminary Analysis Using DigComp 2.1 Framework.” In *Embracing Technological Advancements for Lifelong Learning*, 1-31,



2024. <https://doi.org/10.4018/979-8-3693-1410-4.ch001>.

- Abulibdeh, A., E. Zaidan, and R. Abulibdeh. "Navigating the Confluence of Artificial Intelligence and Education for Sustainable Development in the Era of Industry 4.0: Challenges, Opportunities, and Ethical Dimensions." *Journal of Cleaner Production* 437 (2024). <https://doi.org/10.1016/j.jclepro.2023.140527>.
- Adekunle, B.M., H.S. Olanrewaju, and B.I. Idowu. "Islamic Education in Nigeria from Rote Learning to E-Learning." In *Proceedings of the European Conference on E-Learning, ECEL*, 422–27, 2015.
- Adnan, Muhammad Ichsan, Ratna Mulyany, and Aliamin. "Accountability of Islamic Boarding School: A Comparative Insights from Modern and Traditional Pesantren in Aceh, Indonesia." *2023 International Conference on Sustainable Islamic Business and Finance, SIBF 2023*, 2023. <https://doi.org/10.1109/SIBF60067.2023.10379865>.
- Agrawal, S., N. Sharma, and S. Bhatnagar. *Education 4.0 to Industry 4.0 Vision: Current Trends and Overview. Lecture Notes in Mechanical Engineering*, 2021. [https://doi.org/10.1007/978-981-16-3033-0\\_45](https://doi.org/10.1007/978-981-16-3033-0_45).
- Ahmad, K.A., F. Asni, M.H. Hasbulah, H. Hashom, W.A. Mustafa, A.M. Noor, S. Tambak, and K. Nasir. "Mobile Learning of Islamic Studies: A Comprehensive Review." *Journal of Advanced Research in Applied Sciences and Engineering Technology* 48, no. 2 (2025): 211–24. <https://doi.org/10.37934/araset.48.2.211224>.
- Alamin, N S, Z S Rahmawati, M B Maha, S Nisa', and A Zalzuli. "Hidden Curriculum In Students' Activities At Modern Islamic Boarding School: Phenomenology Study at Darussalam Gontor Islamic Boarding School, Ponorogo, East Java." *Miqot: Jurnal Ilmu-Ilmu Keislaman* 48, no. 1 (2024): 57–72. <https://doi.org/10.30821/miqot.v48i1.1134>.
- Alip Nur Yanto, Wawan Abdullah, and Muammar Zulfiqri. "Digitalisasi Pesantren Darul Mustafa Lebak Banten." *Tarbiyatuna: Jurnal Pendidikan Islam* 16, no. 2 (August 15, 2023): 131–44. <https://doi.org/10.54471/tarbiyatuna.v16i2.2601>.
- Álvarez-álvarez, C, I Del Arco Bravo, Ò Flores-Alarcia, and A Olondriz Valverde. "Banning Mobile Phones in Schools: A Systematic Review of the Literature." *Revista Complutense de Educacion* 35, no. 4 (2024): 741–50. <https://doi.org/10.5209/rced.88983>.
- Amin, Husnul. "Pemberdayaan Teknologi Dalam Manajemen Pendidikan Pesantren: Studi Kasus Pesantren 4.0." *Raudhah Proud To Be Professionals: Jurnal Tarbiyah Islamiyah* 9, no. 2 SE-Articles (December 15, 2024). <https://doi.org/10.48094/raudhah.v9i2.745>.
- Anttiroiko, A.-V. "Castells' Network Concept and Its Connections to Social, Economic and Political Network Analyses." *Journal of Social Structure* 16 (2015): 18.
- Appelbaum, P S. "Informed Consent of Research Subjects." In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, 110–15, 2015. <https://doi.org/10.1016/B978-0-08-097086-8.11023-2>.
- Arim, S.N., M.T. Ajmain, K. Abdul Razak, M.N. Mohamad Salleh, A.S. Yusof, and S.S. Mohd Noor. *Navigating Educational Turbulence: A Systematic Literature Review on*



*Challenges Faced by Islamic Education Amid the Pandemic. Studies in Systems, Decision and Control.* Vol. 537, 2024. [https://doi.org/10.1007/978-3-031-62106-2\\_50](https://doi.org/10.1007/978-3-031-62106-2_50).

Armstrong, F. *Social Constructivism and Action Research: Transforming Teaching and Learning through Collaborative Practice. Action Research for Inclusive Education: Participation and Democracy in Teaching and Learning*, 2019. <https://doi.org/10.4324/9781351048361-2>.

Azizah, N, E Nurdianzah, M M Wijaya, T Azami, and A Rohman. "Religious Moderation in The Industrial Era 4.0: Deradicalization Through The Development of Intellectual Traditions at Fadhlul Fadhlul Islamic Boarding School Semarang." *Jurnal Pendidikan Agama Islam* 20, no. 2 (2023): 233–46. <https://doi.org/10.14421/jpai.v20i2.7771>.

Azra, Azyumardi, Dina Afrianty, and Robert W Hefner. "Pesantren and Madrasa: Muslim Schools and National Ideals in Indonesia." In *Schooling Islam: The Culture and Politics of Modern Muslim Education*, edited by Robert W Hefner and Muhammad Qasim Zaman, 172–98. Princeton: Princeton University Press, 2007. <https://doi.org/doi:10.1515/9781400837458.172>.

Bashori, Bashori. "Modernisasi Lembaga Pendidikan Pesantren." *Jurnal Ilmu Sosial Mamangan* 6, no. 1 (2017): 47. <https://doi.org/10.22202/mamangan.1313>.

Bautista-Rodriguez, M A. "Observation in Research." In *Studies of Rhesus Monkeys and Their Behaviors*, 189–216, 2018. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85059003430&partnerID=40&md5=83766487c41b03c431806334233a72e7>.

Beland, L.-P., and R Murphy. "Ill Communication: Technology, Distraction & Student Performance." *Labour Economics* 41 (2016): 61–76. <https://doi.org/10.1016/j.labeco.2016.04.004>.

Böttger, T, and K Zierer. "To Ban or Not to Ban? A Rapid Review on the Impact of Smartphone Bans in Schools on Social Well-Being and Academic Performance." *Education Sciences* 14, no. 8 (2024). <https://doi.org/10.3390/educsci14080906>.

BPS. "Proporsi Individu Yang Menguasai/Memiliki Telepon Genggam Menurut Provinsi (Persen), 2021-2023." [bps.go.id](https://www.bps.go.id), 2024. <https://www.bps.go.id/id/statistics-table/2/MTIyMSMy/proporsi-individu-yang-menguasai-memiliki-telepon-genggam-menurut-provinsi.html>.

Braslavskiy, R.G. "Anthony Giddens and Civilizational Analysis: Modernity between Reflexivity and Culture | Энтони Гидденс и Цивилизационный Анализ: Модерн Между Рефлексивностью и Культурой1." *Zhurnal Issledovaniy Sotsial'noi Politiki* 22, no. 1 (2023): 147–74. <https://doi.org/10.17323/1728-192x-2023-1-147-174>.

Bruinessen, Martin Van. *Kitab Kuning, Pesantren, Dan Tarekat*. Yogyakarta: Gading Publishing, 2020.

Bull, Ronald A. Lukens-. *Islam, Pendidikan, Dan Masyarakat Indonesia: Pengalaman 30 Tahun*. Yogyakarta: Suka Press, 2024.

Cahana, A, and S A Hurst. "Voluntary Informed Consent in Research and Clinical



- Care: An Update." *Pain Practice* 8, no. 6 (2008): 446–51. <https://doi.org/10.1111/j.1533-2500.2008.00241.x>.
- Castells, M. *The Network Society: A Cross-Cultural Perspective. The Network Society: A Cross-Cultural Perspective*, 2004. <https://doi.org/10.4337/9781845421663>.
- — —. *The Rise of the Network Society: With a New Preface, Volume I: Second Edition With a New Preface. The Rise of the Network Society: With a New Preface, Volume I: Second Edition With a New Preface*, 2010. <https://doi.org/10.1002/9781444319514>.
- Creswell, John W. "Research Design Pendekatan Kualitatif, Kuantitatif, Dan Mixed." *Yogyakarta: Pustaka Pelajar*, 2010.
- Dekas, Rikie, and Santi Oktavianti. "Pelatihan Bisnis Online Shop Dalam Membentuk Jiwa Entrepreneur Remaja Kota Prabumulih Pada Masa Pandemi Covid-19." *Jurnal Abdidas* 2, no. 3 SE- (June 24, 2021): 662–69. <https://doi.org/10.31004/abdidas.v2i3.332>.
- Dhofier, Zamakhsyari. *Tradisi Pesantren: Studi Pandangan Hidup Kyai Dan Visinya Mengenai Masa Depan Indonesia*. Jakarta: LP3ES, 2011.
- Dirawan, Gufran Darma, Dyah Darma Andayani, and Nurlita Pertiwi. "Peningkatan Literasi Digital Pada Santri Pesantren Syeh Hasan Yamani Memanfaatkan Aplikasi Canva." *Jurnal Masyarakat Madani Indonesia* 2, no. 4 (October 14, 2023): 366–71. <https://doi.org/10.59025/js.v2i4.129>.
- Donose, C, C.-M. Schreiner, I Pavel, and M A Pintilei. "Monitoring of Classical and Modern Education." In *2023 International Conference on Electromechanical and Energy Systems, SIELMEN 2023 - Proceedings*, 2023. <https://doi.org/10.1109/SIELMEN59038.2023.10290831>.
- Hamdani, N A. "Scrutinizing Islamic Higher Education Institutions In Indonesia." *Jurnal Pendidikan Islam* 9, no. 1 (2023): 93–106. <https://doi.org/10.15575/jpi.v0i0.24478>.
- Hamzah, M I, A Ismail, and M A Embi. "The Impact of Technology Change in Malaysian Smart Schools on Islamic Education Teachers and Students." *World Academy of Science, Engineering and Technology* 37 (2009): 379–91. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-78651576178&partnerID=40&md5=b6933346ed1c99a80ed5ef1fa1fa2dae>.
- Hasanuddin, Hasanuddin. "Efektivitas Penggunaan Media Digital Dalam Pembelajaran Bahasa Arab Di Pesantren Darul Ikhlas Panyabungan Kab. Mandailing Natal." *Berkala Ilmiah Pendidikan* 4, no. 3 SE-Articles (November 3, 2024): 500–505. <https://doi.org/10.51214/bip.v4i3.1155>.
- Hayati, Nur. "Pembelajaran Jarak Jauh Selama Pandemi Di Pondok Pesantren Darunajah 2 Bogor." *RESIPROKAL: Jurnal Riset Sosiologi Progresif Aktual* 2, no. 2 (December 21, 2020): 151–59. <https://doi.org/10.29303/resiprokal.v2i2.42>.
- Hrytsenchuk, O.O., and S.I. Trubachev. "Creation and Development of the Digital Learning Environment in Educational Institutions." In *ACM International Conference Proceeding Series*, 156–60, 2021. <https://doi.org/10.1145/3526242.3526257>.



- Ikbal, Muhamamd, Ali Jusri Pohan, and Suryadi Nasution. *Pergumulan Sistem Pesantren: Transformasi Menuju Identitas Baru*. Mandailing Natal: Madina Publisher, 2021.
- Imam Fahrurrozi, JUwari, Zainal Aris Masruchi. "Manajemen Pondok Pesantren Di Era 5.0: Mengoptimalkan Pendidikan Berbasis Teknologi Dan Inklusi." *AJMIE: Alhikam Journal of Multidisciplinary Islamic Education* 5, no. 2 (2024). <https://doi.org/10.32478/90e3q542>.
- "Interviewing." In *Understanding Communication Research Methods: A Theoretical and Practical Approach, Fourth Edition*, 111–26. Taylor and Francis, 2024. <https://doi.org/10.4324/9781003432173-12>.
- Jenkins, E K, A Slemon, R J Haines-Saah, and J Oliffe. "A Guide to Multisite Qualitative Analysis." *Qualitative Health Research* 28, no. 12 (2018): 1969–77. <https://doi.org/10.1177/1049732318786703>.
- Juliyanti, Rina, and Nur Aizah. "Motivasi Pilihan Karir Bagi Remaja Pada Masa Pandemi Covid-19: Motivasi Pilihan Karir Bagi Remaja Pada Masa Pandemi Covid-19." *Anterior Jurnal* 20, no. 2 SE-Articles (April 29, 2021): 119–26. <https://doi.org/10.33084/anterior.v20i2.1661>.
- Kamalludeen, R.B.M. *Technology Infusion in the Design of an Impactful Islamic Education Learning Experience. Supporting Modern Teaching in Islamic Schools: Pedagogical Best Practice for Teachers*, 2022. <https://doi.org/10.4324/9781003193432-8>.
- Karadži, E. "The Concept of Modernity in the Work of Anthony Giddens | Koncept Modernosti u Djelu Anthonyja Giddensa." *Revija Za Sociologiju* 48, no. 1 (2018): 77–103. <https://doi.org/10.5613/rzs.48.1.3>.
- Kemal Husen, and Muhammad Husni. "Peran Pesantren Dalam Meneguhkan Identitas Budaya Indonesia Di Tengah Arus Modernisasi." *IHSAN: Jurnal Pendidikan Islam* 3, no. 1 SE-Articles (February 7, 2025): 387–97. <https://doi.org/10.61104/ihsan.v3i1.847>.
- Kiky. "Kemandirian Pesantren Expo Ramaikan MQKN 2023." [dki.kemenag.go.id](https://dki.kemenag.go.id), 2023. <https://dki.kemenag.go.id/berita/kemandirian-pesantren-expo-ramaikan-mqkn-2023-F3Hph>.
- Krippendoff, Klaus. *Content Analysis: An Introduction To Its Methodology*. London: SAGE Publications Inc, 2018.
- Kusuma Zamahsari, G, A Purnomo Ap, M Badruddin Amin, A Nur Efendi, M Hafid Effendy, and I Cahya Adiebia. "Pedatren: Educational Administration Applications for Simplifying Paiton Probolinggo's Nurul Jadid Islamic Boarding School's Management." In *Proceedings of the 2023 17th International Conference on Ubiquitous Information Management and Communication, IMCOM 2023*, 2023. <https://doi.org/10.1109/IMCOM56909.2023.10035651>.
- Kuznetsova, O.Yu., L N Degtyareva, and I E Moiseeva. "Innovative Teaching Methods. Problem-Based Learning and Distance-Learning Technologies." *Russian Family Doctor* 23, no. 2 (2019): 27–34. <https://doi.org/10.17816/RFD2019227-34>.
- Latif, Muhaemin. "Pergulatan Pesantren Dengan Modernitas (Bercermin Pada Pondok





- Pesantren DDI Mangkoso, Barru)." *Al-Qalam* 25, no. 2 (2019): 379. <https://doi.org/10.31969/alq.v25i2.768>.
- Lindgren, T, A Mujahidin, and A C Rofiq. "A Model of Transformative Religious Education: Teaching and Learning Islam in Pondok Modern Darussalam Gontor, Indonesia." *Millah: Journal of Religious Studies* 23, no. 1 (2024): 171-212. <https://doi.org/10.20885/millah.vol23.iss1.art6>.
- Lukens-Bull, Ronald. "Madrasa By Any Other Name: Pondok, Pesantren, and Islamic Schools in Southeast Asia." *Journal of Indonesian Islam*. 4, no. 1 (2010). <https://doi.org/10.15642/JIIS.2010.4.1.1-21>.
- Ma'Arif, S. "Education as a Foundation of Humanity: Learning from the Pedagogy of Pesantren in Indonesia." *Journal of Social Studies Education Research* 9, no. 2 (2018): 104-23. <https://doi.org/10.17499/jsser.58854>.
- Mahn, H. *Essential Aspects of Vygotsky's Theoretical Framework and Methodological Approach Revealed in His Analysis of Unit(le)S. The Routledge Handbook of Sociocultural Theory and Second Language Development*, 2018. <https://doi.org/10.4324/9781315624747>.
- Malla, H A B, A Haryani, A Abu, and A Nur. "Teachers' Digital Literacy Ability to Improve Islamic Religion Education Learning in Islamic Boarding School." *International Journal of Educational Reform*, 2023. <https://doi.org/10.1177/10567879231211287>.
- Mardiah Astuti, Herlina Herlina, Ibrahim Ibrahim, Miftahur Rahma, Siska Salbiah, and Ima Jumratus Soleha. "Mengoptimalkan Penggunaan Teknologi Dalam Pendidikan Islam." *Concept: Journal of Social Humanities and Education* 2, no. 3 SE-Articles (July 31, 2023): 28-40. <https://doi.org/10.55606/concept.v2i3.504>.
- Mian, S.H., B. Salah, W. Ameen, K. Moiduddin, and H. Alkhalefah. "Adapting Universities for Sustainability Education in Industry 4.0: Channel of Challenges and Opportunities." *Sustainability (Switzerland)* 12, no. 15 (2020). <https://doi.org/10.3390/su12156100>.
- Mondragón-Barrios, L. "Informed Consent: A Dialogic Praxis for the Research." *Revista de Investigacion Clinica* 61, no. 1 (2009): 73-82. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-67649726911&partnerID=40&md5=4c6bb061a527714551938e0ed7c72fd1>.
- Mu'allim, Amir. "Isu Terorisme Dan Stigmatisasi Terhadap Pondok Pesantren (Meluruskan Kesalahpahaman Terhadap Pondok Pesantren)." *Millah: Journal of Religious Studies* 6, no. 1 SE-Articles (August 2, 2016): 47-60. <https://doi.org/10.20885/millah.vol6.iss1.art5>.
- Muchasan, Ali, Nur Syam, and Anis Humaidi. "Pemanfaatan Teknologi Di Pesantren (Dampak Dan Solusi Dalam Konteks Pendidikan)." *INOVATIF: Jurnal Penelitian Pendidikan, Agama, Dan Kebudayaan* 10, no. 1 (2024): 16-33. <https://doi.org/10.55148/inovatif.v10i1.849>.
- Muhammad, A R, and T Zulfikar. "Opportunities and Challenges Faced by State Islamic Tertiary Education Institutions in 4.0 Industrial Era." *Multidisciplinary*



- Science Journal* 5, no. 3 (2023). <https://doi.org/10.31893/multiscience.2023036>.
- Mukri, Syarifah Gustiawati. "Modernisasi Sistem Pendidikan Pesantren." *FIKRAH* 6, no. 1 SE-Artikel (June 26, 2013). <https://ejournal.uika-bogor.ac.id/index.php/FIKRAH/article/view/124>.
- Nasution, S, M Ikbāl, and A J Pohan. "Dinamika Pesantren: Studi Futuristic Transformasi-Tansmisi Sistem Pesantren Di Mandailing Natal." *Edukasi Islami ...*, 2022. <http://jurnal.staialhidayahbogor.ac.id/index.php/ei/article/view/1853>.
- Nasution, Suryadi, Muhammad Ikbāl, and Ali Jusri Pohan. "Dinamika Pesantren: Studi Futuristic Transformasi-Tansmisi Sistem Pesantren Di Mandailing Natal." *Edukasi Islami: Jurnal Pendidikan Islam* 10, no. 3 (2021): 319–41. <https://doi.org/10.30868/ei.v10i001.1853>.
- Novik, N., S. Bashinova, N. Kunshina, and A. Sukharev. "Digital Learning Environment in Modern Conditions." In *CEUR Workshop Proceedings*, 2861:97–102, 2020.
- O'Brien, M., S. Penna, and C. Hay. *Theorising Modernity: Reflexivity, Environment & Identity in Giddens' Social Theory. Theorising Modernity: Reflexivity, Environment & Identity in Giddens' Social Theory*, 2014. <https://doi.org/10.4324/9781315840871>.
- Oktalyra, Ratih, Cantika Dwi, and Karina Ananda. "Pelatihan Penggunaan Media Sosial Untuk Promosi Usaha Atau Bisnis Bagi Remaja Di Daerah Cikokol Tangerang." *ADI Pengabdian Kepada Masyarakat* 1, no. 2 SE-Articles (May 3, 2021): 54–59. <https://doi.org/10.34306/adimas.v1i2.432>.
- Palitsky, R, D Sullivan, L A Keefer, and S A Stewart. "The Cultural Backdrop to Prospecion: Exploring the Relevance of Time-Space Distanciation." *Review of General Psychology* 20, no. 1 (2016): 86–100. <https://doi.org/10.1037/gpr0000068>.
- Pishchalnikova, V.A. "L. S. Vygotsky's Cultural-Historical Theory: Globalisation, Post-Non-Classical Paradigm and Digitalisation | Культурно-Историческая Теория Л. С. Выготского: Глобализация, Постнеклассическая Парадигма и Цифровизация." *Russian Language at School* 82, no. 4 (2021): 52–60. <https://doi.org/10.30515/0131-6141-2021-82-4-52-60>.
- Qurtubi, A. "Architecture Enterprise Model of Islamic College Management in Indonesian Industrial Era 5.0." *Philippine Journal of Science* 153, no. 3 (2024): 1097–1105. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85198393937&partnerID=40&md5=f679ed2e0986a22688aad65b525965ee>.
- Rahman, Bambang Arif. "Islamic Revival and Cultural Diversity: Pesantren's Configuration in Contemporary Aceh, Indonesia." *Indonesian Journal of Islam and Muslim Societies* 12, no. 1 (2022): 201–29. <https://doi.org/10.18326/ijims.v12i1.201-229>.
- Raza, K., and Y. Chen. "Assessing the Dynamic Impact of Natural Resource Utilization, Technological Innovation, and Environmental Regulations on OECD Economic Growth and Globalization." *Environment, Development and Sustainability*, 2024. <https://doi.org/10.1007/s10668-024-05741-9>.



- Ridwan Maulana Rifqi Muzakky, Rijaal Mahmuudy, and Andhita Risiko Faristiana. "Transformasi Pesantren Menghadapi Era Revolusi Digital 4.0." *ALADALAH: Jurnal Politik, Sosial, Hukum Dan Humaniora* 1, no. 3 (June 11, 2023): 241–55. <https://doi.org/10.59246/aladalah.v1i3.371>.
- Rozi, M. "Dynamization Of Islamic Religion Education: A Critical Study on Genealogy of Islamic Boarding Schools Scholarly Traditinaion in Lombok." *Miqot: Jurnal Ilmu-Ilmu Keislaman* 45, no. 2 (2021): 226–47. <https://doi.org/10.30821/miqot.v45i2.812>.
- Saada, N, and H Magadlah. "The Meanings and Possible Implications of Critical Islamic Religious Education." *British Journal of Religious Education* 43, no. 2 (2021): 206–17. <https://doi.org/10.1080/01416200.2020.1785844>.
- Sahin, A. "Critical Issues in Islamic Education Studies: Rethinking Islamic and Western Liberal Secular Values of Education." *Religions* 9, no. 11 (2018). <https://doi.org/10.3390/rel9110335>.
- Salsabila, Unik Hanifah, Dwi Nur Indah Sari, Rahma Sabilla, Aswin Nurjanah, and Anggi Pratiwi Rasyid. "Trend Media Sosial Dalam Pendidikan Islam; Analisis Tentang Model Pemanfaatannya." *Fitrah: Journal of Islamic Education* 3, no. 2 SE-Articles (December 30, 2022): 71–84. <https://doi.org/10.53802/fitrah.v3i2.125>.
- Şekerci, A., and A. Çakmak. "Dropout in Qur'an Course In Hafiz Education | Hafızlık Eğitiminde Kur'an Kursu Terki." *Hitit Theology Journal* 22, no. 1 (2023): 359–92. <https://doi.org/10.14395/hid.1160427>.
- Selwyn, N, and J Aagaard. "Banning Mobile Phones from Classrooms – An Opportunity to Advance Understandings of Technology Addiction, Distraction and Cyberbullying." *British Journal of Educational Technology* 52, no. 1 (2021): 8–19. <https://doi.org/10.1111/bjet.12943>.
- Sullivan, D, L A Keefer, S A Stewart, and R Palitsky. "Time-Space Distanciation: An Interdisciplinary Account of How Culture Shapes the Implicit and Explicit Psychology of Time and Space." *Journal for the Theory of Social Behaviour* 46, no. 4 (2016): 450–74. <https://doi.org/10.1111/jtsb.12103>.
- Sultanuzzaman, M.R., H. Fan, E.A. Mohamued, M.I. Hossain, and M.A. Islam. "Effects of Export and Technology on Economic Growth: Selected Emerging Asian Economies." *Economic Research-Ekonomika Istrazivanja* 32, no. 1 (2019): 2515–31. <https://doi.org/10.1080/1331677X.2019.1650656>.
- Syafi, M, and A S Azizah. "Pemberdayaan Berbasis Teknologi Dan Informasi Melalui Aplikasi Maktabah Al Syamilah Dan Maushuah Al Hadis Di Pesantren Alhidayah Prapak Kranggan ...." *Jurnal Ilmiah Citra Ilmu* 15, no. 30 SE-Articles (November 15, 2019). [http://download.garuda.kemdikbud.go.id/article.php?article=3582122%5C&val=31073%5C&title=Pemberdayaan Berbasis Teknologi dan Informasi Melalui Aplikasi Maktabah Al Syamilah dan Maushuah Al Hadis di Pesantren Alhidayah Prapak Kranggan Kabupaten Temanggung](http://download.garuda.kemdikbud.go.id/article.php?article=3582122%5C&val=31073%5C&title=Pemberdayaan+Berdasarkan+Teknologi+dan+Informasi+Melalui+Aplikasi+Maktabah+Al+Syamilah+dan+Maushuah+Al+Hadis+di+Pesantren+Alhidayah+Prapak+Kraggan+Kabupaten+Temanggung).
- Tyastuti, Isnaning. "Pesantren Dan Tantangan Modernisasi Dalam Buku



Menggerakkan Tradisi Karya Kh. Abdurrahman Wahid." *Al-Adabiya: Jurnal Kebudayaan Dan Keagamaan* 13, no. 02 SE-Articles (December 28, 2018). <https://doi.org/10.37680/adabiya.v13i02.30>.

Underwood, M K. "Protecting Confidentiality in a Study of Adolescents' Digital Communication." In *Ethical Challenges in the Behavioral and Brain Sciences*, 76–79, 2015. <https://doi.org/10.1007/9781139626491.026>.

Underwood, M K, and S E Ehrenreich. "The Power and the Pain of Adolescents' Digital Communication: Cyber Victimization and the Perils of Lurking." *American Psychologist* 72, no. 2 (2017): 144–58. <https://doi.org/10.1037/a0040429>.

Wibowo, Adi. "Penggunaan Media Sosial Sebagai Trend Media Dakwah Pendidikan Islam Di Era Digital." *Jurnal Islam Nusantara* 03, no. 02 (2019): 339–56. <https://jurnalnu.com/index.php/as/article/view/141>.