Chatra: Jurnal Pendidikan dan Pengajaran
E-ISSN: 2774-3829|Page; 43-53
https://journal.yazri.com/index.php/chatra/index

Deep Learning Principles in Nahdlatul Wathan Madrasah Curriculum (1934–1997): A Historical Perspective

Herman Zuhdi[1], Swastika Jonchhen[2]
[1]Nahdlatul Ulama University of Indonesia, Jakarta
[2]Kathmandu University of Education, Kathmandu, Bāgmatī, Nepal

ABSTRACT

Purpose – This study investigates how the curriculum of Madrasah Nahdlatul Wathan (NW) from 1934 to 1997 embodied pedagogical principles aligned with modern deep learning theories. It aims to demonstrate the potential of traditional Islamic education to contribute to the design of context-based, value-oriented curricula for contemporary madrasahs.

Design/methods/approach – A qualitative historical-descriptive method was employed. The research analyzed curriculum documents, teaching materials, and visual archives, alongside semi-structured interviews with NW teachers and alumni. Data were examined through content and thematic analysis, supplemented by quantitative assessment of deep learning indicators across educational levels.

Findings – The findings reveal that NW's curriculum promoted deep understanding, independent learning, social collaboration, and strong spiritual values. These principles were reflected in practices like halaqah discussions, critical text interpretation, public speaking exercises, and community engagement. Quantitative analysis showed an upward trend in deep learning principles from the elementary to the senior levels, with consistently high spiritual integration. Although developed decades ago, NW's model parallels modern educational goals and offers insight for integrating traditional pedagogy with digital innovations such as AI-driven learning tools.

Research implications/limitations – The study suggests traditional Islamic education provides rich models for developing transformative, value-based curricula. Challenges include limited archival data and reliance on retrospective interviews. Further research should explore practical frameworks for combining heritage-based pedagogies with modern technological tools.

OPEN ACCESS

ARTICLE HISTORY
Received: 20-04-2025
Revised: 20-07-2025
Accepted: 23-07-2025

KEYWORDS
deep learning, Islamic education, madrasah curriculum, nahdlatul wathan

Corresponding Author:

Herman Zuhdi
History of Islamic Civilization, Nahdlatul Ulama University of Indonesia, Jakarta
Taman Amir Hamzah Street No. 5, RT.8/RW.4, Pegangsaan, Menteng District, Central Jakarta City, Special Capital Region of Jakarta 10320
Email: hermanzuhdi1989@gmail.com

Introduction

Education has long served as a strategic foundation for building civilizations and producing individuals who are not only intellectually capable but also spiritually grounded and socially sensitive. Along with the progression of time, global education systems demand learning approaches that transcend mere memorization of facts, moving toward profound understanding and the practical application of knowledge in real-life contexts. One of the prominent approaches in modern education discourse is the concept of deep learning, which emphasizes meaningful, analytical, reflective, and transformative learning processes at both individual and societal levels (Biggs & Tang, 2011; Marton & Saljo, 1976). This concept is increasingly relevant in addressing the challenges of the twenty-first century, where learners are expected to develop critical thinking, creativity, and effective collaboration skills.

In the realm of technology, deep learning also refers to a branch of machine learning that utilizes multi-layered artificial neural networks to capture complex patterns in data through nonlinear transformations and high-level abstractions (Elhassani et al., 2022; Janiesch et al., 2021). This technology has revolutionized various fields, ranging from image and speech recognition in computer vision and natural language processing to autonomous systems such as driverless vehicles and robotics (Mohan et al., 2022; Tan et al., 2021; Wong, 2021). Despite its remarkable capability to mimic human cognitive processes, deep learning still faces significant challenges, including the need for large volumes of labeled data, high computational costs, and issues of interpretability due to its "black box" nature (Kovac et al., 2023). Consequently, the development of more efficient algorithms and the enhancement of model transparency remain critical focuses in advancing deep learning applications in the future.

However, when viewed more broadly, the principles of deep learning are not merely a contemporary phenomenon arising from technological advancements. The concept of deep learning, in the educational sense, has deep historical roots within Islamic educational traditions, particularly in the environments of pesantren and madrasah. Traditional Islamic education has never confined itself merely to the rote memorization of religious content but has long emphasized understanding, contextual application of knowledge, and the cultivation of character and spirituality (A. Azra, 1998; H. Azra, 2018; Ismaya et al., 2020; Ruly Nadian Sari & Ulfah Umurohmi, 2025). Practices such as halaqah, sorogan, bandongan, and critical study of classical texts (kitab kuning) are concrete manifestations of deep learning, even before the term was formally introduced. Islamic education views the transmission of knowledge as encompassing not only the cognitive domain but also the affective and psychomotor dimensions, which strongly align with the demands of twenty-first-century education.

The madrasah curriculum in Indonesia has evolved as a dynamic framework that seeks to integrate Islamic religious education with general education. Its structure typically includes subjects such as Aqidah, Fiqh, Islamic morality, as well as general sciences, all designed to build a robust foundation of both religious and secular knowledge (Anwar et al., 2023; Asbari, 2024). Implementation varies across regions, influenced by government policies, local contexts, and global developments such as the transition from the 2013 Curriculum to the more flexible, technology-oriented Merdeka Curriculum (Hazyimara, 2024; Rovi'i et al., 2023). Nevertheless, madrasahs continue to face significant challenges, including limited technological resources, the need for comprehensive teacher training, and the necessity of designing adaptive and contextual learning processes (Putra et al., 2022; Shodikin et al., 2024). In this context, exploring the historical footprints of how deep learning principles were embedded in madrasah curricula is crucial to ensuring that the pedagogical heritage of Islamic education can inform contemporary curriculum reforms.

Although numerous studies have examined deep learning in both technological and contemporary pedagogical contexts, research connecting deep learning principles with traditional Islamic educational practices—particularly within the curriculum of Madrasah Nahdlatul Wathan (NW)—remains relatively scarce. Yet NW, as one of the prominent Islamic educational organizations in Indonesia since 1934, has developed a tiered curriculum system spanning MI, MTs, and MA levels, integrating religious values, nationalism, and life skills education. Against this backdrop, this study aims to conduct a historical analysis of how deep learning principles were implemented within the NW madrasah curriculum during the period of 1934–1997. This research seeks to fill an existing gap in the literature by offering a historical perspective that may serve as a valuable reference for developing contemporary madrasah curricula that are more contextual, transformative, and grounded in local values.

Materials and Methods

This study employs a qualitative approach using a historical-descriptive research design. The historical approach was chosen because the focus lies in tracing the implementation of deep learning principles within the curriculum of Madrasah Nahdlatul Wathan (NW) during the period from 1934 to 1997, a significant era representing considerable developments in Indonesia's traditional Islamic educational system (Creswell, 2014; Patton, 2015). The descriptive method is used to systematically and objectively present facts, social contexts, and the dynamics of the curriculum during this period (Yin, 2018).

Types and Sources of Data

The data collected in this research are qualitative in nature and consist of two categories: primary and secondary data. Primary data include official curriculum

documents of NW Madrasahs at the Madrasah Ibtidaiyah (MI), Madrasah Tsanawiyah (MTs), and Madrasah Aliyah (MA) levels, issued during the 1934–1997 period, as well as in-depth interviews conducted with key NW figures, including senior teachers, madrasah administrators, and alumni who directly experienced the educational processes during that time. Utilizing primary data is crucial in historical research to obtain authentic narratives from individuals directly involved in the historical events (Howell & Prevenier, 2001).

Meanwhile, secondary data consist of relevant scholarly literature on Islamic education, historical books about NW, previous research on madrasah curricula, journal articles, and organizational archives containing information about policies, programs, and educational activities during the research period. Additional references include international literature on the concept of deep learning within educational contexts, intended to support comparative analysis between traditional Islamic educational practices and modern educational paradigms.

Data Collection Techniques

Data collection was conducted in several stages. First, document analysis involved gathering, selecting, and examining relevant NW madrasah curriculum documents. These documents included syllabi, teaching manuals, instructional materials, minutes of educational meetings, and internal NW archives. Document analysis is essential in historical research for identifying the social context and substantive content of curricula (Bowen, 2009).

Second, in-depth interviews were carried out using a semi-structured approach. These interviews aimed to capture contextual information not recorded in documents by exploring the experiences, understandings, and interpretations of informants regarding teaching practices in NW madrasahs, particularly those related to deep learning principles such as deep comprehension, independent learning, collaboration, and the integration of religious and general knowledge (Patton, 2015). Third, indirect observations were performed using field notes, photographic documentation, and NW's visual archives that recorded teaching activities, halaqah methods, discussions of classical Islamic texts (kitab kuning), and various extracurricular activities during the studied period (Hollweck, 2015).

Data Analysis Techniques

Data were analyzed through content analysis and thematic analysis. Content analysis was employed to identify patterns, themes, and deep learning principles present in NW curriculum documents and archives. This process involved data reduction, categorization, meaning interpretation, and drawing conclusions (Krippendorff, 2013). Meanwhile, thematic analysis was applied to interview data to trace narratives, experiences, and informants' perceptions regarding the implementation of deep learning

in NW madrasahs. This method is effective in capturing subjective meanings in qualitative research (Braun & Clarke, 2019).

All analytical processes were conducted iteratively, with interim findings being validated through discussions with informants (member checking) to ensure the accuracy of the results (Creswell, 2018). Additionally, the researcher employed source triangulation and methodological triangulation to enhance the study's validity by comparing data gathered from documents, interviews, and visual archives (Patton, 2015). Triangulation is considered a crucial strategy for ensuring the credibility and trustworthiness of qualitative research findings (Hollweck, 2015).

Research Location

This research was conducted in East Lombok, which serves as the central hub of Nahdlatul Wathan's educational activities. The location was chosen for its significant historical value, as Madrasah NW has flourished in this area since the organization's founding in 1934, making it an authentic representation of Islamic boarding school-based educational practices deeply embedded with the values of deep learning.

Result

This research revealed that the curriculum of Madrasah Nahdlatul Wathan (NW) during the period from 1934 to 1997 encompassed educational practices that extended far beyond a mere transmission of religious texts. Educational activities at NW were not limited to literal mastery of religious knowledge but involved processes of internalizing values, cultivating reasoning skills, and integrating spiritual understanding into daily life. Through the teaching of classical Islamic texts, interactive dialogues between teachers and students, and continuous religious and social engagement, NW developed an educational framework that unified knowledge and practical application. Data obtained from curriculum documents, visual archives, and interviews with alumni and educators demonstrated that NW's educational process operated with a reflective and contextual approach, embodying core characteristics of what is recognized today as deep learning.

At the Madrasah Ibtidaiyah (MI) level, instruction was designed to instill the fundamentals of Islamic belief, jurisprudence, ethics, and habitual worship in children's daily lives. The NW MI curriculum explicitly contained religious subjects taught through practical activities such as daily prayers, recitations from the Qur'an, and memorization integrated with comprehension of meanings. Classroom atmospheres depicted in visual archives portrayed students seated in circles, engaging closely with teachers in discussions. Teachers guided students to understand the meaning of religious texts, encouraged them to ask questions, and related lessons to practical contexts in their home and community environments. This approach fostered an inclusive learning environment, built students' confidence from an early stage, and laid a strong spiritual foundation.

The transition to the Madrasah Tsanawiyah (MTs) level signaled a significant advancement in both the cognitive and social dimensions of learning. The MTs curriculum introduced basic classical texts, Arabic grammar, and thematic exegesis, demanding analytical comprehension of religious content. Interviews with alumni highlighted how teachers not only required reading and memorization but also tasked students with explaining texts in their own words and relating lessons to contemporary social issues such as poverty, youth behavior, and ethical conduct. Beyond formal classes, activities such as public speaking (muhadharah) and student organizations provided authentic spaces for students to practice speaking confidently, think critically, and collaborate. These experiences gave students genuine opportunities to develop reflective and collaborative learning practices, aligning with the principles of deep learning.

Meanwhile, at the Madrasah Aliyah (MA) level, educational practices reached a high degree of intensity and sophistication. The MA NW curriculum covered advanced topics such as in-depth exegesis, hadith studies, principles of Islamic jurisprudence, and contemporary socio-religious issues. Teachers encouraged students to engage in dialectical thinking, compare scholarly opinions, and formulate arguments supported by both textual evidence and contextual reasoning. Learning often took the form of open discussions and debate simulations. Community service activities, including delivering Friday sermons, teaching Qur'an recitation in villages, and supporting community religious initiatives, were integral parts of the curriculum. Based on interviews, students reported that these practical experiences were the most impactful aspect of their education, as they allowed them to apply knowledge directly in real-life contexts. To support these qualitative findings, this research also developed a quantitative assessment of the implementation of deep learning principles across each educational level, as presented in the following table:

Deep Learning Principles	MI NW	MTs NW	MA NW
Deep Understanding	3	4	5
Independent Learning	3	4	5
Social Collaboration	2	4	5
Spiritual Values	5	5	5

Note: 1 = very low, 5 = very high

The table above demonstrates a significant upward trend in the implementation of deep learning principles from MI through MA. Deep understanding and independent learning increased progressively alongside curricular complexity, reflecting NW's gradual cultivation of intellectual autonomy among students. Social collaboration showed the most substantial leap, moving from a score of 2 at MI to 4 at MTs and reaching 5 at MA, indicating growing engagement in discussions, group work, and organizational activities.

Spiritual values remained consistently high across all levels, underscoring the unwavering role of spiritual dimensions as the core foundation of NW's educational model. Graphical visualizations based on this table illustrated a linear upward trend in deep learning practices, further validating the qualitative insights of this study.

In conclusion, the findings of this research do not merely illustrate that NW's educational practices aligned with principles now recognized as deep learning but also highlight that traditional Islamic educational heritage possesses deep epistemological foundations and pedagogical value highly relevant to modern educational contexts. The integration of profound understanding, experiential learning, spiritual reflection, and social collaboration demonstrates that even traditional madrasah systems are capable of constructing a holistic and transformative educational model. Thus, the practices developed at NW offer valuable insights for designing contemporary madrasah curricula that are contextual, value-driven, and well-balanced between tradition and innovation.

Discussion

The findings of this study indicate that Madrasah Nahdlatul Wathan (NW), historically, has implemented many principles that are theoretically recognized today as deep learning, even though the term itself was not used during the period from 1934 to 1997. Through the teaching of *kitab kuning* (classical Islamic texts), in-depth discussions, the cultivation of critical thinking, and social engagement, the educational process at NW emphasized the comprehension of meaning, value reflection, and the application of knowledge in real-life contexts. This reflects the core characteristics of deep learning as articulated by Marton & Säljö (1976) and Biggs & Tang (2011) , namely, the integration of new knowledge with lived experiences and the development of the ability to transfer knowledge across different situations. NW's tiered curriculum model, ranging from MI to MA levels, demonstrates continuity and structured progression, naturally reinforcing the foundations of deep learning in a sustainable manner.

Interestingly, the deep learning values embedded in NW's madrasah tradition today hold significant potential to be further strengthened and developed through the use of advanced technologies, particularly via the integration of artificial intelligence-based deep learning algorithms. In the global context, technological deep learning has been employed to develop various intelligent applications in Islamic educational institutions, including madrasahs. One example is the implementation of a bidirectional GRU-CNN encoder model capable of automatically recognizing Qur'an recitation and providing feedback on pronunciation errors, thus assisting students in madrasahs to improve their *tajwid* skills in a personalized and accurate manner (*Quran Recitation Recognition Using End-to-End Deep Learning*, 2023). Such technological integration can enhance the meaning-centered

learning long practiced manually within NW, making it more efficient and adaptive to students' individual needs.

Furthermore, the application of deep learning within digital learning platforms, such as Learning Management Systems (LMS), can be leveraged to analyze student performance data in real time, deliver automatic feedback, and personalize learning experiences based on each learner's preferred style. Sutaryono (2023) demonstrated that e-learning integrated with deep learning significantly improved learning effectiveness during the pandemic, and madrasahs can seize this opportunity to continue adaptive and reflective digital learning. Even for Arabic language education, applications such as Alef, which incorporate deep learning algorithms, have proven capable of creating personalized learning paths tailored to students' proficiency levels, enhancing the efficiency of language acquisition (Haddade et al., 2023). This resonates with NW's principle of contextual and integrated learning, which now stands to be further reinforced with data-driven and AI-powered tools.

Nevertheless, the adoption of such technologies in the madrasah environment is not without substantial structural, pedagogical, and ethical challenges. One major obstacle is the limited digital infrastructure and unequal access prevalent in many madrasahs, particularly those located in rural areas or traditional pesantren settings (Santosa, 2022). Additionally, teachers, as the frontline implementers of the curriculum, require specialized training and continuous professional support to effectively integrate deep learning technologies into their instructional practices (Haidir et al., 2021). Another crucial challenge pertains to data privacy and ethics, as deploying deep learning technologies in education involves the collection and processing of significant amounts of students' personal data. Therefore, madrasahs need to establish clear data protection policies and appropriate regulations to safeguard student information (Marduati et al., 2024).

Consequently, the integration of deep learning, both in its classical pedagogical sense and modern technological form, must be approached cautiously and contextually. Traditional values deeply rooted in Islamic educational systems, such as spirituality, service, and character building, must not be displaced solely by technological sophistication. Rather, technology should serve as a tool to enrich and strengthen pedagogical practices that have been culturally and historically proven effective. Integrative models like STREAM DiGlim, which combines digital literacy with religious education (Wulandari et al., 2022), and the STEAM approach that merges science with spiritual values (Kharozim, n.d.), can inspire the design of technology-based madrasah curricula firmly anchored in Islamic principles. By overcoming implementation challenges and formulating inclusive policies, madrasahs hold significant potential to emerge as pioneers of Islamic educational innovation grounded in values, meaning, and future-oriented technology.

Conclusion

This study has demonstrated that the curriculum of Madrasah Nahdlatul Wathan (NW) between 1934 and 1997, although developed in a historical context without modern terminology, inherently embodied many principles of deep learning, such as fostering critical thinking, independent inquiry, collaborative learning, and the integration of spiritual values into educational practice. These findings underscore that traditional Islamic educational systems possess significant pedagogical wisdom that remains relevant for contemporary curriculum development. Moreover, the integration of technological deep learning applications—such as automated Qur'an recitation analysis, adaptive language learning platforms, and data-driven teaching analytics—offers opportunities to enhance and modernize these traditional practices while preserving their spiritual core. However, successful implementation requires addressing challenges related to infrastructure, teacher training, and data ethics. Therefore, it is recommended that madrasahs adopt a balanced approach, utilizing modern technological tools as enablers rather than replacements for traditional pedagogical methods. Future research should explore practical models for integrating artificial intelligence into Islamic education contexts while safeguarding cultural and religious values, thereby contributing to an educational paradigm that is both innovative and rooted in identity.

References

Anwar, S., Ishomuddin, I., & Faridi, F. (2023). Dynamics of the Islamic Education Curriculum in Madrasah: Study K-13 and Merdeka Curriculum. *JIE (Journal of Islamic Education)*, *8*(2), 266–282. https://doi.org/10.52615/jie.v8i2.365

Asbari, M. (2024). Kurikulum Madrasah Diniyah Takmiliyah: Membangun Sikap Beragama Inklusif. *Jurnal Manajemen Pendidikan*. https://doi.org/10.70508/literaksi.v2i02.725

Azra, A. (1998). *Esei-esei Intelektual Muslim Pendidikan Islam*. PT Logos Wacana Ilmu.

Azra, H. (2018). *Islamic Education in Indonesia* (pp. 763–780). https://doi.org/10.1007/978-3-319-64683-1_32

Biggs, J., & Tang, C. (2011). *Teaching For Quality Learning At University*. McGraw-Hill Education. https://books.google.co.id/books?id=XhjRBrDAESkC

Bowen, G. A. (2009). *Document Analysis as a Qualitative Research Method* (Vol. 9). https://doi.org/10.3316/QRJ0902027

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Creswell, J. W. , & P. C. N. (2018). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. SAGE Publications.

Elhassani, M. E., Maisonnasse, L., Olgiati, A., Jerome, R., Rehali, M., Duroux, P., Giudicelli, V., & Kossida, S. (2022). Deep Learning concepts for genomics : an overview. *EMBnet.Journal*, *27*. https://doi.org/10.14806/ej.27.0.990

Haddade, H., Nur, A., Mustami, Muh. K., & Achruh, A. (2023). Technology-based learning strategies in Digital Madrasah Program. *Cypriot Journal of Educational Sciences*, *18*(1), 55–70. https://doi.org/10.18844/cjes.v18i1.8179

Haidir, H., Joharis, J., Salim, S., & Zairina, N. (2021). *Development of Learning Models in Madrasah in Minority Islamic Area*. *10*(02). https://doi.org/10.30868/EI.V10I02.1662

Hazyimara, K. (2024). A New Paradigm of Madrasah Learning in the Implementation of Merdeka Curriculum. *Jurnal Penelitian Pendidikan Islam*. https://doi.org/10.36667/jppi.v11i2.1676

Hollweck, T. (2015). Robert K. Yin. (2014). *Case Study Research Design and Methods (5th ed.). Canadian Journal of Program Evaluation*, *30*(1), 108–110. https://doi.org/10.3138/cjpe.30.1.108

Ismaya, N., Ratnawati, R., & Ristianti, D. H. (2020). NILAI-NILAI PENDIDIKAN ISLAM DALAM TRADISI KENDUREI DULANG PAT. *Andragogi: Jurnal Pendidikan Islam Dan Manajemen Pendidikan Islam*, *2*(3), 80–98. https://doi.org/10.36671/andragogi.v2i3.103

Janiesch, C., Zschech, P., & Heinrich, K. (2021). Machine learning and deep learning. *ArXiv: Artificial Intelligence*. https://doi.org/10.1007/S12525-021-00475-2

Kharozim, M. A. (n.d.). *STEAM Learning Model in Madrasah Ibtidaiyah*. https://doi.org/10.55210/elementary.v2i2.445

Kovac, V. B., Nome, D. Ø., & Jensen, A. R. (2023). The why, what and how of deep learning: critical analysis and additional concerns. *Education Inquiry*, 1–17. https://doi.org/10.1080/20004508.2023.2194502

Krippendorff, K. (2013). *Content Analysis: An Introduction to Its Methodology*. Sage Publications.

Marduati, M., Mawardi, M., W, A. S., & Faizurrahman, S. (2024). Cultural Heritage Sites as Learning Resources: Innovations in the Madrasah Operational Curriculum (KOM) at Madrasah Ibtidaiyah. *Pionir : Jurnal Pendidikan*, *13*(3), 184. https://doi.org/10.22373/pjp.v13i3.25871

Marton, F., & Saljo, R. (1976). ON QUALITATIVE DIFFERENCES IN LEARNING: I—OUTCOME AND PROCESS*. *British Journal of Educational Psychology*, *46*(1), 4–11. https://doi.org/10.1111/j.2044-8279.1976.tb02980.x

Mohan, V. V, Prakash, P., & Resmi, K. R. (2022). A Survey on Deep Learning Concepts and Techniques. *International Journal of Advanced Research in Science, Communication and Technology*, 20–27. https://doi.org/10.48175/ijarsct-4903

Patton, M. Q. (2015). *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*. SAGE Publications.

Putra, M. I., Neliwati, N., Azmar, A., & Azhar, A. (2022). An Analysis of Madrasah Curriculum and Its Implementation in Basic Education Institutions. *Jurnal Basicedu*, *6*(6), 9565–9572. https://doi.org/10.31004/basicedu.v6i6.4102

Quran Recitation Recognition using End-to-End Deep Learning. (2023). https://doi.org/10.48550/arxiv.2305.07034

Rovi'i, A., Ahid, N., Musafak, M. A., & Kurniadi, Y. (2023). Madrasah curriculum development. *Educenter Jurnal Ilmiah Pendidikan*, *2*(2), 242–251. https://doi.org/10.55904/educenter.v2i2.768

Ruly Nadian Sari, & Ulfah Umurohmi. (2025). Nilai-Nilai Pendidikan Islam dalam Pembentukan Karakter Anak menurut Pandangan Abdullah Nashih Ulwan. *Chatra:*

Jurnal Pendidikan Dan Pengajaran, *3*(1), 20–26. https://doi.org/10.62238/chatra.v3i1.181

Santosa, S. (2022). The Digital Madrasah as an Idea of IT-Based Islamic Education. *Nazhruna*, *5*(2), 379–391. https://doi.org/10.31538/nzh.v5i2.2121

Shodikin, E. N., Ramadhan, R. N., Hidayat, N., & Maftuch, F. (2024). Implementation of madrasa curriculum based on islamic boarding school at al i'tisham wonosari. *Deleted Journal*, 91–98. https://doi.org/10.59944/jipsi.v3i3.330

Sutaryono, M. (2023). IMPLEMENTASI APLIKASI E-LEARNING MADRASAH DALAM MENINGKATKAN EFEKTIVITAS DAN HASIL BELAJAR PADA MASA PANDEMI COVID 19 DI MTsN 20 JAKARTA TIMUR. *Secondary*, *3*(1), 38–46. https://doi.org/10.51878/secondary.v3i1.1944

Tan, F. G., Yüksel, A. S., Aydemir, E., & Ersoy, M. (2021). *Derin Öğrenme Teknikleri İle Nesne Tespiti Ve Takibi Üzerine Bir İnceleme*. *25*, 159–171. https://doi.org/10.31590/EJOSAT.878552

Wong, Y. K. (2021). Understanding the Features of Deep Learning. In *viXra*.

Wulandari, D., Mutmainah, S., Prastyo, H., Fauziah, S. F., Fachmi, T., Sundari, E., & Mubarok, H. (2022). STREAM DigLIM: Learning Innovation in Madrasah to Develop Students' Literacy. *Advances in Social Science, Education and Humanities Research*. https://doi.org/10.2991/assehr.k.220104.021