

Teacher Professionalism in Developing Environment-Based Innovative Learning Media through Herbarium

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Abstract

Learning of Al-Qur'an Hadith in *Madrasah Ibtidaiyah* still tends to be textual, so students' understanding of the meaning of the verses is often less contextual and meaningful. This study aims to describe teacher professionalism in developing innovative, environment-based learning media through the use of a herbarium. The research employed a descriptive qualitative approach with data collection techniques including observation, interviews, and documentation. Data analysis was carried out through data reduction, data display, and conclusion drawing. The results show that teacher professionalism is reflected in two main activities: planning and environmental exploration based on Qur'anic verses, as well as the preparation and presentation of herbaria as contextual learning media. The use of herbarium media was able to improve students' cognitive understanding, foster affective attitudes such as gratitude and environmental awareness, and develop psychomotor skills through the activities of compiling and presenting their work. This media has advantages because it is contextual, economical, and increases students' active involvement. However, it requires a relatively longer time and depends on the environmental conditions around the madrasah. It is recommended that teachers at MINU continue to develop environment-based learning media and combine them with other innovations to enrich meaningful Al-Qur'an Hadith learning that is oriented toward character building.

Keywords: teacher professionalism, innovative media, herbarium, environment-based learning, Al-Qur'an Hadith

INTRODUCTION

Primary education plays a strategic role in laying the foundation for students' knowledge, attitudes, and skills from an early age (OECD, 2019; UNESCO, 2020). At the *Madrasah Ibtidaiyah* (MI) level, education is not only focused on mastering academic competencies but also on character building, environmental awareness, and the internalization of Islamic values in daily life (Muhaimin, 2012; Suyadi, 2020). Therefore, the learning process in MI requires contextual, meaningful approaches closely related to students' real-life experiences to achieve optimal educational outcomes (Johnson, 2002; Trianto, 2014).

One of the determining factors for successful learning in *Madrasah Ibtidaiyah* is teacher professionalism, which has been widely recognized as a critical factor in improving student learning outcomes (Darling-Hammond et al., 2017; Tjabolo & Herwin, 2020). Teacher professionalism is a key element in enhancing the quality of learning, as it significantly influences students' academic achievement and learning motivation (Tjabolo & Herwin, 2020; Wurdayani & Herwin, 2021). Teachers are not only required to master the subject matter but also to develop innovative learning strategies and media that make the learning process

meaningful and contextual for students (Darling-Hammond et al., 2017; Suryawati & Osman, 2018). In the context of primary education, effective learning requires students' active involvement through learning experiences closely connected to their surrounding environment. Therefore, teachers' ability to integrate the environment as a source and medium of learning becomes an essential part of pedagogical professionalism. This aligns with research by Zhang, which finds that teachers play a central role in the success of environmental education, serving as facilitators who shape students' attitudes, knowledge, and behaviors toward the environment (Zhang et al., 2025).

Teacher professionalism plays a crucial role in addressing the challenges of learning in *Madrasah Ibtidaiyah*. Teachers are required to possess creativity and innovation in selecting appropriate learning approaches and media to ensure that the learning process is effective and meaningful for students (Darling-Hammond et al., 2017; Suryawati & Osman, 2018). In addition, ethical and professional aspects serve as an important foundation in managing the learning process in madrasahs, as they influence teachers' attitudes, responsibilities, and interactions with students (Tjabolo & Herwin, 2020; Zuhdi, 2018). Therefore, strengthening teacher professionalism is essential to support the implementation of quality and contextual learning in *Madrasah Ibtidaiyah*.

In the context of the Merdeka Curriculum, teachers are positioned as facilitators of learning who encourage students to be active, critical, and creative. This curriculum emphasizes the importance of learning based on real-life experiences, the surrounding environment, and the strengthening of the Pancasila Student Profile. The Merdeka Curriculum provides opportunities for teachers to develop innovative, environment-based, and contextual learning (Rahayu et al., 2022). These conditions require MI teachers to demonstrate professionalism that is adaptive to curriculum changes, including in the development of innovative and meaningful learning media. Student-centered learning based on real-life experiences has become an essential approach in sustainability education in the modern era (Erdogan, 2021).

Learning media plays a crucial role in supporting the effectiveness of the teaching and learning process. As an essential component of instruction, learning media functions as an intermediary that helps students understand abstract concepts by making them more concrete, engaging, and easier to comprehend (Kurniawan & Sudarmin, 2015; Suryawati & Osman, 2018) the appropriate use of learning media can also enhance students' motivation, interest, and active participation in the learning process, thereby contributing to improved learning outcomes (Suryawati & Osman, 2018; Wurdayani & Herwin, 2021). Therefore, the integration of effective learning media is necessary to create meaningful and student-centered learning experiences.

Environment-based learning plays a significant role in connecting scientific concepts with students' real-life experiences. It enables students to understand abstract concepts more meaningfully by linking them to real-world contexts (Erdogan, 2021; Kurniawan & Sudarmin, 2015). The natural environment functions not only as an object of learning but also as a medium for instilling values such as responsibility, environmental awareness, and spiritual reflection on God's creation (Kurniawan & Sudarmin, 2015; Suryawati & Osman, 2018). In *Madrasah Ibtidaiyah*, learning is implemented in an integrated manner across subjects, allowing teachers to relate instructional content to natural phenomena as a form of contextual learning (Zuhdi, 2018). Therefore, environment-based learning is highly relevant in supporting holistic and value-based education in *Madrasah Ibtidaiyah*.

Learning Al-Qur'an Hadith in *Madrasah Ibtidaiyah* plays a crucial role in developing students' understanding of Islamic teaching in a comprehensive manner. It is not only oriented toward the ability to read and memorize verses but also toward understanding their meanings and integrating the values contained within them in daily life (Rissanen, 2012; Zuhdi, 2018). One relevant approach in teaching Al-Qur'an Hadith

is to relate Qur'anic verses and hadiths to natural phenomena as a form of understanding the kauniyah verses (signs of nature), which can strengthen students' contextual and reflective thinking (Rissanen, 2012; Suryawati & Osman, 2018). This approach requires teachers' creativity and innovation in designing learning media that can connect the subject matter with students' concrete experiences, thereby making learning more meaningful and engaging (Kurniawan & Sudarmin, 2015; Suryawati & Osman, 2018). Therefore, innovative and contextual approaches are essential in improving the quality of al-Qur'an Hadith learning in *Madrasah Ibtidaiyah*.

The natural environment has great potential as a source and medium of learning, including in the teaching of Al-Qur'an Hadith. Environment-based learning enables students to gain direct learning experiences through observation and exploration, making the learning process more meaningful and reflective (Erdogan, 2021). Through the utilization of the environment, students can be encouraged to recognize the signs of God's greatness reflected in His creation. However, in practice, the teaching of Al-Qur'an Hadith at the *Madrasah Ibtidaiyah* level is still often conducted in a textual manner and centered on textbooks, so the use of the environment as a learning medium has not been optimal. This condition calls for innovations in learning media that can support Al-Qur'an Hadith instruction to become more contextual and meaningful.

One of the environment-based learning media that can be developed by teachers is the herbarium. A herbarium is a collection of preserved plant specimens that are systematically arranged so that they can be used as learning media. Several studies have shown that the use of a herbarium as a learning medium can help concretize concepts, increase student engagement, and support environment-based exploratory learning (Kurniawan & Sudarmin, 2015). In this context, a herbarium containing various plant types can be used to introduce students to biodiversity, which is one of the teachings of Islam emphasizing the importance of preserving and appreciating God's creation (Zuhdi, 2018).

The use of innovative learning media is essential in supporting the effectiveness of Al-Qur'an Hadith learning in *Madrasah Ibtidaiyah*. One example of such media is a herbarium, which can be utilized to help students understand the relationship between Qur'anic verses and natural phenomena in a more concrete and meaningful way (Kurniawan & Sudarmin, 2015; Suryawati & Osman, 2018). Through this approach, students are not only able to comprehend the content of the verses but also develop awareness of the importance of preserving the environment as a trust (amanah) from God (Erdogan, 2021; Rissanen, 2012). The use of Herbarium media also reflects teachers' creativity and professionalism in designing instructional innovations that are relevant to students' characteristics at the *Madrasah Ibtidaiyah* level (Darling-Hammond et al., 2017; Tjabolo & Herwin, 2020). Therefore, the integration of herbarium-based learning media can contribute to more contextual, value-based, and engaging learning experiences.

The development and utilization of the herbarium as a learning medium requires the active role and creativity of teachers. Teachers need to plan the learning process, select relevant materials, and design learning activities that directly engage students. This process reflects teacher professionalism in managing learning, from planning and implementation to reflection. The use of a herbarium as a learning medium can also stimulate students' creativity (Suryawati & Osman, 2018). Research conducted by Salsabila indicates that learning with herbarium media tends to yield higher learning outcomes than with image-based media (Nadya, 2023). Thus, the use of the herbarium is not only oriented toward students' learning outcomes but also serves as an indicator of teachers' ability to innovate and develop learning media that are aligned with students' characteristics and the context of the madrasah.

This research was conducted at *Madrasah Ibtidaiyah Nahdlatul Ulama* (MINU) Metro, a private madrasah in Metro City with diverse student characteristics. Based on preliminary observations, the teaching of Al-Qur'an Hadith at MINU Metro has been implemented in accordance with the curriculum; however, the

use of environment-based learning media remains limited. Teachers tend to rely on conventional methods, and the potential of the surrounding environment has not been optimally utilized as a learning medium. This condition presents an opportunity to develop innovative environment-based learning media, such as a herbarium, to support learning of the Al-Qur'an and Hadith.

Several studies have examined the use of learning media and teacher professionalism in primary education (Darling-Hammond et al., 2017; Tjabolo & Herwin, 2020). However, previous studies have predominantly focused on the use of learning media in general subjects or on teacher professionalism separately, with limited attention given to the integration of environment-based media, such as herbaria, in Al-Qur'an Hadith learning at the *Madrasah Ibtidaiyah* level. In addition, studies that specifically examine how teacher professionalism is reflected in the development of such innovative media are still scarce.

Therefore, this study aims to fill this gap by examining in depth how the professionalism of *Madrasah Ibtidaiyah* teachers is reflected in developing innovative environment-based learning media through the herbarium. This study is expected to contribute theoretically to the discourse on teacher professionalism and, practically, to provide insights for MI teachers in optimizing contextual and meaningful environment-based learning.

METODE

This study employs a qualitative research design with a descriptive approach. The qualitative approach was chosen because this study aims to gain an in-depth understanding of the phenomenon of *Madrasah Ibtidaiyah* teachers' professionalism in developing innovative environment-based learning media through the herbarium. This approach allows the researcher to explore the meanings, processes, and experiences of teachers in designing and utilizing the herbarium as a learning medium. Descriptive qualitative research does not focus on hypothesis testing, but rather on systematically and factually describing the realities that occur in the field.

The research was conducted at *Madrasah Ibtidaiyah Nahdlatul Ulama* (MINU) Metro. The location was selected purposively based on the consideration that the madrasah has implemented environment-based learning. The study was carried out during the odd semester of the 2025/2026 academic year for approximately two months, covering the stages of preparation, data collection, and data analysis.

The subjects of this study were MINU teachers who developed and used the herbarium as a learning medium. The subjects were selected using purposive sampling, which is a sampling technique based on specific considerations, as not all teachers develop environment-based media. In addition to teachers, supporting informants in this study included the head of the madrasah and students who were involved in learning using herbarium media. The involvement of students aimed to obtain additional information regarding the implementation and impact of using the herbarium in the learning process.

The data collection techniques in this study included observation, in-depth interviews, and documentation. Observation was conducted to obtain a direct overview of the process of planning, developing, and utilizing the herbarium in learning. The researcher observed teachers' activities during the learning process, including interactions between teachers and students, strategies for delivering the material, and students' responses to the media used.

In-depth interviews were conducted with teachers as the main subjects of the study to explore information regarding their understanding of professionalism, the reasons for developing the herbarium, the creative processes involved, as well as the challenges faced in its implementation. Interviews were also conducted with the head of the madrasah to identify institutional support for innovation in environment-

based learning media. The interview technique used was semi-structured, allowing the researcher to have guiding questions while remaining flexible in exploring emerging data in the field.

Documentation was used as a supporting technique to strengthen the data obtained from observations and interviews. The collected documents included teaching modules, photographs of learning activities, students' herbarium work, and other supporting documents relevant to the study. Documentation serves as authentic evidence of teachers' professionalism in developing learning media.

The data analysis technique in this study is a qualitative data analysis model comprising three main stages: data reduction, data display, and conclusion drawing/verification (Sugiyono, 2022). Data reduction involved selecting, focusing, and simplifying the raw data from observations, interviews, and documentation. At this stage, the researcher categorized the data based on aspects relevant to the research focus, such as forms of teacher professionalism, the process of developing the herbarium, and the implementation of the media in learning.

The next stage is data presentation. The reduced data are then presented in narrative descriptions, matrices, or simple tables to facilitate the researcher's understanding of patterns, relationships, and trends emerging from the research findings. Data presentation is carried out systematically to ease the process of interpretation and discussion of the research results.

The final stage is drawing conclusions and verification. At this stage, the researcher interprets the presented data to answer the research questions. The conclusions drawn are initially tentative, then continuously verified throughout the research process until credible and accountable conclusions are obtained. To ensure data validity, this study employs source triangulation and technique triangulation, namely by comparing data from observations, interviews, and documentation to ensure the consistency and validity of the findings.

RESULTS AND DISCUSSION

Planning and Environmental Exploration Based on Qur'anic Verses

The results of the study indicate that teachers at *Madrasah Ibtidaiyah Nahdlatul Ulama* (MINU) Metro have demonstrated professionalism in designing an environment-based Al-Qur'an Hadith learning through herbarium media. The planning process integrated Qur'anic verses on the creation of plants and the signs of Allah's greatness with environmental exploration activities around the school. This is in line with research conducted by Sundman, which shows that experience-based learning is proven to connect learning concepts with real-life practice and to enhance students' cognitive and social skills (Jupriyanto, 2024; Zhang et al., 2025).

Teacher professionalism plays a crucial role in supporting effective learning in *Madrasah Ibtidaiyah*. Teachers are not only responsible for delivering material in a textual manner but are also expected to develop concrete learning media that enable students to understand the content of Qur'anic verses in a contextual way (Mintasih et al., 2024; Suyadi et al., 2023). This aligns with the concept of teacher professionalism, which emphasizes the importance of pedagogical competence and innovation in designing learning media that are relevant to the characteristics of elementary school students (Setyorini & Khuriyah, 2023). Therefore, teachers' ability to innovate in developing contextual learning media is essential to enhance students' understanding and engagement in the learning process.

Teacher professionalism is reflected in the planning stage of learning through the development of structured and innovative teaching modules. At this stage, teachers design learning activities that integrate environmental observation, plant collection, drying processes, herbarium preparation, and reflection on Qur'anic values embedded in Allah's creation. This process demonstrates teachers' competence in

implementing experience-based learning (experiential learning), which emphasizes direct student involvement in meaningful learning experiences (Jupriyanto, 2024). Experiential learning has been shown to enhance students' engagement, motivation, and understanding through real-life learning experiences (Jupriyanto, 2024; Zhang et al., 2025). Therefore, careful planning that integrates experiential and value-based approaches is essential to create effective and contextual learning in *Madrasah Ibtidaiyah*.

The implementation of environment-based learning is reflected in the environmental exploration stage, which emphasizes students' active involvement in the learning process. At this stage, students are encouraged to identify various types of plants around the school environment as part of direct learning activities. This approach allows students not only to listen to the teacher's explanations but also to conduct direct observations of the objects being studied, thereby enhancing their understanding through real-life experiences (Jupriyanto, 2024). Active involvement in learning activities has been shown to improve students' engagement, critical thinking, and conceptual understanding (Jupriyanto, 2024; Zhang et al., 2025). Therefore, environmental exploration activities play an important role in creating meaningful and student-centered learning experiences.

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Teacher professionalism plays a crucial role in the successful implementation of environment-based learning activities. In this context, teacher professionalism is reflected in their ability to design contextual learning, manage outdoor classes effectively, and guide students in connecting natural phenomena with the meanings of Qur'anic verses. These competencies demonstrate teachers' pedagogical and professional skills in creating meaningful learning experiences that integrate cognitive, affective, and spiritual aspects (Hasan & Auliya, 2023; Setyorini & Khuriyah, 2023; Suyadi et al., 2023). Furthermore, effective classroom management in outdoor settings and the ability to link learning materials with real-life contexts have been shown to enhance students' engagement and understanding (Jupriyanto, 2024; Zhang et al., 2025). Therefore, teacher professionalism is a key factor in ensuring that environment-based learning can be implemented effectively and meaningfully in *Madrasah Ibtidaiyah*.

Herbarium Preparation and Presentation as an Innovative Learning Medium

The implementation of learning was carried out through several stages: (1) introduction to verses about plants in the Qur'an, (2) observation of the school environment, (3) collection and drying of plants, (4) preparation of the herbarium, and (5) presentation of the final work. Teachers guided students in the process of drying plants, arranging compositions, and organizing the aesthetic layout of the herbarium frames. This stage demonstrates teachers' creativity in developing innovative learning media based on local potential. The following is an example of a herbarium created by students:



Figure 1. Example of Herbarium as a Learning Medium for Al-Qur'an Hadith

The work shown in Figure 1 demonstrates students' ability to arrange various types of plants in a systematic and aesthetic manner. The herbarium media serve as a visual tool to strengthen students' understanding of the verses that have been studied. Students' creativity in arranging different types of plants collected from the school environment helps them understand the meaning of verses about plant diversity as a sign of Allah's power.

After the preparation process was completed, students were asked to present their work in front of the class. This activity not only assessed their understanding of the material but also trained their communication skills and self-confidence. Documentation of the presentation activities can be seen in the following figure:



Figure 2. Students Presenting Their Herbarium Work

Students' learning motivation and engagement can be observed through their active participation and positive responses during the learning process. Students' positive expressions and confidence when presenting their work indicate an increase in learning motivation. They demonstrated practical skills in collecting, drying, and arranging plants as part of the herbarium activity, which reflects their active involvement in experiential learning. In addition, students showed a sense of pride in their group work and were able to explain the relationship between Qur'anic verses and the types of plants used, indicating both cognitive understanding and affective development. These findings are consistent with previous studies showing that active and experience-based learning can enhance students' motivation, confidence, and conceptual understanding (Azmi et al., 2025; Jupriyanto, 2024; Zhang et al., 2025). Therefore, the use of environment-based learning activities contributes positively to students' motivation and holistic learning outcomes.

Teacher professionalism plays a crucial role in ensuring the effectiveness of learning implementation in *Madrasah Ibtidaiyah*. It is not only reflected in the planning stage but also in teachers' ability to implement meaningful, contextual, and innovative learning practices in the classroom. In this study, the development and use of a herbarium as a learning medium demonstrate how teachers can creatively integrate environmental resources into Al-Qur'an Hadith learning. This approach shows that learning can be delivered in a contextual, creative, and environment-based manner without relying solely on digital

technology, while still enhancing students' engagement and understanding. These findings are consistent with previous studies indicating that innovative and context-based learning media can improve the quality of learning and students' learning experiences (Mintasih et al., 2024; Nasution & Mubarak, 2024; Setyorini & Khuriyah, 2023; Utomo, 2023). Therefore, teacher professionalism is a key factor in developing effective and meaningful learning innovations in *Madrasah Ibtidaiyah*.

Data obtained from observations and interviews indicate that the use of herbaria impacts three main aspects: cognitive, affective, and psychomotor. In the cognitive aspect, students find it easier to understand the content of verses related to plants and the creations of Allah. They are able to explain the relationship between the studied verses and the plants they have collected. In the affective aspect, there is an observable increase in gratitude, environmental awareness, and the understanding that nature is part of the signs of Allah's greatness. In the psychomotor aspect, students demonstrate skills in collecting, drying, and arranging plants into aesthetically pleasing herbarium media.

Teacher professionalism in this study is reflected in several aspects. First, the ability to design contextual learning that integrates religious and environmental values. Second, the ability to manage the classroom actively through exploratory activities. Third, creativity in utilizing local potential as an innovative learning medium. Teachers do not merely act as transmitters of knowledge but also as innovators in the learning process. The use of the herbarium as a learning medium demonstrates that the professionalism of *Madrasah Ibtidaiyah* teachers can be realized through simple yet meaningful approaches.

Overall, this study demonstrates that environment-based learning through the herbarium is able to enhance cognitive understanding of the meanings of verses, foster religious attitudes and environmental awareness, develop psychomotor skills in creating learning media, and build confidence in presentations. Therefore, herbarium media serve not only as a visual aid but also as an integrative tool linking Qur'anic values with contextual learning in *Madrasah Ibtidaiyah*.

CONCLUSION

This study concludes that teacher professionalism in *Madrasah Ibtidaiyah* is reflected in the ability to design and implement innovative environment-based learning through the use of herbarium media in Al-Qur'an Hadith learning. The findings indicate that herbarium media effectively support students' contextual understanding of Qur'anic verses related to plants, while also enhancing their learning motivation, environmental awareness, and self-confidence through active participation in exploration, preparation, and presentation activities. These results demonstrate improvements in the cognitive, affective, and psychomotor domains of learning. Theoretically, this study contributes to the development of educational discourse by emphasizing the integration of teacher professionalism, contextual learning, and environment-based media within Islamic primary education. Practically, the findings imply that simple, low-cost, and locally based learning media, such as a herbarium, can serve as an effective alternative to create meaningful and student-centered learning without relying heavily on digital technology. However, this study is limited by the time required for implementation and the specific environmental context, which may affect its broader applicability. Therefore, future research is recommended to expand the use of similar media across different subjects and contexts, as well as to explore its integration with digital learning approaches.

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REFERENCES

- Athoillah, A., Jannah, S. R., & Abrori, M. S. (2025). Character Education Through Al-Barzanji: A Study of Traditional Muslim Society in Tanjung Harapan Village, Seputih Banyak, Central Lampung. *Journal of Research in Islamic Education*, 7(1), 95–106. <https://doi.org/10.25217/jrie.v7i1.5683>
- Azmi, M. F., Winarni, R., & Yulisetiani, S. (2025). Enhancing Short Story Writing through Experiential Learning Integrated with Wordwall Budaya: Unveiling the Role of Learning Motivation. *International Journal of Elementary Education*, 9(2). <https://doi.org/10.23887/ijee.v9i2.94393>
- Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute. <https://doi.org/10.54300/122.311>
- Erdogan, M. (2021). The effect of environmental-based learning on students' academic achievement and attitudes. *International Journal of Instruction*, 14(2), 421–438. <https://doi.org/10.29333/iji.2021.14224a>
- Hasan, M. Z. A., & Auliya, A. (2023). Studi Literatur Review: Pemahaman Teori Relativitas Einstein Dalam Konteks Al-Qur'an dan Sains. *Berkala Ilmiah Pendidikan*, 3(3), 94–102. <https://doi.org/10.51214/bip.v3i3.731>
- Johnson, E. B. (2002). *Contextual teaching and learning: What it is and why it is here to stay*. Corwin Press.
- Jupriyanto, J. (2024). Nature's Power: Integrating STEAM in Outdoor Learning to Enhance 4C Skills and Science Pedagogical Knowledge. *EduBasic Journal: Jurnal Pendidikan Dasar*, 6(1), 49–56. <https://doi.org/10.17509/edubasic.v6i1.82364>
- Kurniawan, Y., & Sudarmin, S. (2015). The development of a science learning module based on local wisdom. *Jurnal Pendidikan IPA Indonesia*, 4(1), 48–54. <https://doi.org/10.15294/jpii.v4i1.3500>
- Mintasih, D., Sukiman, S., & Purnama, S. (2024). Integration of Digital Technology in Islamic Religious Education Learning: A Qualitative Study on Teachers' Competence and Implementation Models. *Jurnal Pendidikan Islam*, 13(1), 85–96. <https://doi.org/10.14421/jpi.2024.131.85-96>
- Muhaimin. (2012). *Pengembangan kurikulum pendidikan agama Islam di sekolah, madrasah, dan perguruan tinggi*. RajaGrafindo Persada.
- Nadya, S. (2023). *Pengaruh media herbarium kering pada pembelajaran IPA berbasis kearifan lokal terhadap hasil belajar siswa kelas IV di MI Taman Pemuda Islam Keramat Banjarmasin* [Skripsi, UIN Antasari Banjarmasin]. <https://idr.uin-antasari.ac.id/25442/>
- Nasution, A., & Mubarak, F. (2024). Critical Analysis of the Modernization of Madrasah Human Resource Development. *Jurnal Pendidikan Islam Indonesia*, 13(2), 441–455.
- OECD. (2019). *OECD future of education and skills 2030: OECD learning compass 2030*. OECD Publishing. <https://www.oecd.org/education/2030-project/>
- Rahayu, R., Rosita, R., Rahayuningsih, Y. S., Hernawan, A. H., & Prihantini, P. (2022). Implementasi Kurikulum Merdeka Belajar di Sekolah Penggerak. *Jurnal Basicedu*, 6(4), 6313–6319. <https://doi.org/10.31004/basicedu.v6i4.3237>
- Rissanen, I. (2012). Teaching Islamic education in Finnish schools: A field of negotiations. *Teaching and Teacher Education*, 28(2), 282–290. <https://doi.org/10.1016/j.tate.2011.10.002>
- Setyorini, E. T., & Khuriyah, K. (2023). The Influence of Teacher Professionalism and Creativity on Student Motivation in Madrasah Ibtidaiyah. *Attadrib: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, 6(1), 40–47. <https://doi.org/10.54069/attadrib.v6i1.374>

- Suryawati, E., & Osman, K. (2018). Contextual learning: Innovative design towards the development of students' scientific attitude and problem-solving skills. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(1), 61–72. <https://doi.org/10.12973/ejmste/80313>
- Suyadi. (2020). *Pendidikan Islam dan neurosains: Menelusuri jejak akal dan otak dalam Al-Qur'an hingga pengembangan keilmuan Islam*. Kencana.
- Suyadi, S., Nuryana, Z., & Sutrisno, S. (2023). The implementation of neuroscience-based learning in Islamic education. *Jurnal Pendidikan Islam*, 12(1), 15–28. <https://doi.org/10.14421/jpi.2023.121.15-28>
- Tjabolo, S. A., & Herwin, H. (2020). The effect of teacher certification on the performance of elementary school teachers in Gorontalo Province, Indonesia. *International Journal of Instruction*, 13(4), 347–360. <https://doi.org/10.29333/iji.2020.13422a>
- Trianto. (2014). *Model pembelajaran terpadu: konsep, strategi, dan implementasinya dalam Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Bumi Aksara.
- UNESCO. (2020). *Global education monitoring report 2020: Inclusion and education: All means all*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000373718>
- Utomo, P. (2023). Development of STEM-Based Interactive Learning Media for Critical Thinking Skills in Renewable Energy: Solar Power Plants. *Jurnal LPT UPGRIS*, 12(1), 15–25.
- Wurdayani, W., & Herwin, H. (2021). The effect of the Think-Pair-Share model on learning outcomes of Civics in elementary school students. *Cypriot Journal of Educational Sciences*, 16(2), 627–640. <https://doi.org/10.18844/cjes.v16i2.5644>
- Zhang, X., Jung, W., & Asari, M. (2025). Systematic review of environmental education teaching practices in schools: Trends and gaps (2015–2024). *Sustainability*, 17(1), 161. <https://doi.org/10.3390/su17010161>
- Zuhdi, M. (2018). Challenging moderate Muslims: Indonesia's Muslim schools in the midst of religious conservatism. *Religions*, 9(10), 310. <https://doi.org/10.3390/rel9100310>