



Analysis of the Mismatch of School Education Infrastructure in Supporting Learning Innovation

Fikri Hamdi Siregar*, Inom Nasution

Universitas Islam Negeri Sumatera Utara, Indonesia

Email : fikrihamdisiregar@gmail.com

DOI: <https://doi.org/10.61987/jemr.v5i3.2093>

ABSTRACT

Keywords:

Educational
Infrastructure;
Learning Innovation;
School Management

*Corresponding Author

This study aims to analyze the mismatch of educational infrastructure in supporting learning innovation, focusing on infrastructure suitability, principal management, causal factors, and its impact on learning effectiveness. The research employs a qualitative approach with a phenomenological method. Data were collected through semi-structured interviews, observations, and documentation, involving school leaders, teachers, and students. Data analysis followed the Miles and Huberman model, including data reduction, data display, and conclusion drawing, with triangulation to ensure validity. The results indicate that educational infrastructure is generally available but insufficient to optimally support learning innovation. Key constraints include limited technology-based learning media, inadequate classroom conditions, and unstable internet access. Budget limitations, rapid technological changes, and outdated facilities are the main factors contributing to the mismatch. These conditions hinder the implementation of innovative learning, leading teachers to rely on conventional methods and reducing student engagement. This study implies that improving educational infrastructure through adaptive management strategies and stronger policy support is essential to enhance the effectiveness and quality of innovative learning.

Article History:

Received: December 2025; Revised: January 2025; Accepted: February 2026

Please cite this article in APA style as:

Siregar, F. H., & Nasution, I. (2026). Analysis of the Mismatch of School Education Infrastructure in Supporting Learning Innovation. *Journal of Educational Management Research*, 5(3), 2537-2550.

INTRODUCTION

Learning innovation has become a fundamental demand in 21st-century education, including in Islamic educational institutions that are expected to remain adaptive to technological and pedagogical developments while preserving Islamic values. This issue is important because innovation directly influences the quality of learning outcomes and the relevance of education to contemporary societal needs. Utami et al. (2023) argue that innovative learning emphasizes active, creative, and student-centered approaches, making the learning process more meaningful and effective. However, without adequate

support systems, such innovation cannot be implemented optimally. Global evidence also shows that educational systems capable of integrating innovation tend to produce learners with better critical thinking and problem-solving skills (World Bank, 2023). Therefore, ensuring the successful implementation of learning innovation is not only an institutional concern but also a societal necessity to prepare future generations for complex global challenges.

Despite its importance, the implementation of learning innovation often faces significant challenges, particularly related to the availability and suitability of educational infrastructure. Many schools struggle to align their facilities with the demands of modern pedagogical approaches, creating a gap between expected and actual learning practices. According to Alif et al. (2021), limitations in facilities and infrastructure hinder teachers from applying innovative strategies effectively. Similarly, Wahyuni and Hidayat (2022) found that technology-based learning cannot function optimally without adequate technological support. In Islamic education, this issue becomes more complex because learning innovation must also support the integration of academic knowledge and Islamic character development (Zulkarnain & Ma'arif, 2021). As a result, the mismatch between infrastructure and learning needs has become a critical problem that affects not only teaching practices but also the overall quality and objectives of education in a broader societal context.

In practice, the mismatch between educational infrastructure and learning innovation is clearly observable in many schools, particularly in resource-limited settings. For instance, several institutions experience inadequate classroom conditions, limited access to digital learning tools, and unstable internet connectivity, all of which hinder the implementation of innovative learning models. At the same time, the absence of facilities such as laboratories and digital libraries restricts students' opportunities to engage in experiential and technology-based learning. Data from the Central Statistics Agency (BPS, 2021) indicate that disparities in educational infrastructure remain a significant issue, especially in rural areas. Furthermore, government initiatives such as online madrasah programs are not fully utilized due to these limitations. This phenomenon demonstrates that, despite the growing emphasis on innovation, many schools are still unable to meet the infrastructural requirements necessary to support effective and equitable learning processes.

Previous studies have extensively examined the relationship between educational infrastructure and learning innovation. Rahman and Wahyuni (2020) found that adequate facilities significantly enhance teachers' creativity in implementing innovative methods such as project-based learning and digital media integration. Likewise, Huda et al. (2021) highlighted that ineffective management of educational facilities leads to difficulties in adopting technology-

based learning, particularly in madrasahs. Fitriyani and Nugroho (2022) further emphasized that physical learning environments, including classroom design and flexibility, play a crucial role in supporting collaborative and student-centered learning. These studies collectively demonstrate that infrastructure is a key determinant of successful learning innovation. However, most of them focus on general relationships between facilities and learning outcomes, without deeply exploring how mismatches occur and how they specifically influence innovation processes within different educational contexts, particularly in Islamic institutions.

Recent research trends also highlight the importance of leadership and management in optimizing educational infrastructure. Afandi and Rosita (2023) emphasize the principal's responsibility in providing adequate facilities, while Lael (2025) suggests that adaptive management strategies can mitigate infrastructure limitations. Ramadhani et al. (2025) further indicate that transformational leadership and data-driven decision-making are positively correlated with effective infrastructure utilization. Additionally, Masinambow et al. (2025) and Haqq et al. (2025) explain that innovation requires systematic management processes, including planning, implementation, and evaluation of resources. However, these studies often treat infrastructure and leadership as separate variables, lacking a comprehensive analysis of how infrastructure mismatch directly affects learning innovation. Moreover, there is limited qualitative evidence that captures real dynamics in schools, particularly regarding how principals prioritize resources under constraints. This gap highlights the need for in-depth research that integrates infrastructure, leadership, and innovation.

This study offers a novel contribution by focusing on the direct relationship between infrastructure mismatch and the effectiveness of learning innovation within the framework of Islamic education management. Unlike previous studies that examine infrastructure or leadership separately, this research integrates both aspects to provide a holistic understanding of how innovation is influenced by resource limitations. It also adopts a phenomenological approach to capture the lived experiences of school stakeholders, enabling a deeper exploration of real conditions in the field. Furthermore, this study emphasizes the importance of aligning physical, technological, and managerial components to support sustainable innovation. By addressing these aspects simultaneously, the research contributes to the development of practical strategies for managing infrastructure in resource-constrained environments. This state-of-the-art perspective is essential for improving educational quality and ensuring that innovation can be implemented effectively in diverse educational contexts.

Based on the identified gaps, this study seeks to analyze the mismatch of educational infrastructure in supporting learning innovation, focusing on infrastructure conditions, principal management, causal factors, and their impact on learning effectiveness. The main research problem is how infrastructure limitations hinder the implementation of innovative learning and how school leadership can address these challenges. The study argues that infrastructure mismatch is not merely a technical issue but a systemic problem that requires integrated management strategies. It is hypothesized that effective leadership, combined with adaptive resource management, can minimize the negative impact of infrastructure limitations and enhance learning innovation. Therefore, this research contributes both theoretically, by enriching the discourse on educational innovation management, and practically, by providing actionable insights for school leaders and policymakers to improve infrastructure utilization and support innovative learning practices.

RESEARCH METHODS

This study employs a qualitative research design with a phenomenological approach to explore the mismatch of educational infrastructure in supporting learning innovation (De Boer & Zeiler, 2024; Oluka, 2025; Pregoner, 2024). The phenomenological approach is chosen because it enables an in-depth understanding of participants' lived experiences regarding infrastructure conditions and their impact on learning practices. A phenomenon becomes meaningful when it is interpreted through the direct experiences of individuals involved (Nasir et al., 2023). The research was conducted at MTs Islamiyah Petanggahan, selected due to its contextual relevance as a madrasah facing diverse resource challenges, particularly in infrastructure provision and technological readiness. Previous studies indicate that variations in school infrastructure significantly influence the effectiveness of learning and student engagement (Akoso & Tjandra, 2024; Sofiana et al., 2025). This setting provides a representative context to examine how infrastructure limitations affect the implementation of innovative learning within Islamic education.

Data were collected through semi-structured interviews, non-participatory observation, and documentation. Interviews were conducted to obtain in-depth information about infrastructure conditions, the principal's managerial role, causal factors of mismatch, and their impact on learning innovation. Observation was carried out directly to examine the physical condition of facilities, their utilization, and classroom learning processes without researcher involvement. Documentation was used to support and validate findings from interviews and observations, including school infrastructure records, work plans, inventory reports, and visual documentation. The

participants in this study consisted of one principal, two teachers, and two students who were selected purposively to represent different perspectives within the school environment. All participants provided consent prior to data collection, and interviews were recorded to ensure data accuracy.

The profiles of the research participants are as follows:

No	Initials	Position	Subject Area	Years of Service	Gender	Age
1	FH	Principal	Qur'an Hadith	26 years	Female	50
2	RHI	Teacher	Mathematics	6 years	Female	27
3	NM	Teacher	Fiqh	23 years	Female	47
4	SHT	Student	-	-	Female	13
5	FAP	Student	-	-	Male	13

Data analysis in this study follows the interactive model proposed by Miles and Huberman (Miles & Huberman, 1994), which includes data condensation (reduction), data display, and conclusion drawing with verification. Data condensation involves selecting, focusing, and simplifying raw data obtained from interviews, observations, and documentation. Data display is conducted by organizing information into narrative descriptions and matrices to identify patterns and relationships. The final stage involves drawing and verifying conclusions continuously throughout the research process to ensure the credibility of findings. To enhance validity, source triangulation and technique triangulation were applied by comparing data across participants and cross-checking findings from multiple data collection methods, ensuring that the results accurately reflect the empirical conditions of infrastructure mismatch and its impact on learning innovation.

RESULTS AND DISCUSSION

Results

This section presents the research findings obtained through direct interviews with the principal, two teachers, and two students at MTs Islamiyah Petangguhan. The presentation of findings is organized based on the research problem formulation and is aligned with the characteristics of qualitative research.

The Condition and Level of Infrastructure Mismatch in Supporting Learning Innovation

This section presents the findings related to the analysis of the mismatch in school educational infrastructure in supporting learning innovation. The data were obtained from interviews with the principal, teachers, and students, which describe the condition of infrastructure mismatch in supporting innovative learning.

Based on the interview results, the available infrastructure at MTs Islamiyah Petangguhan has not fully met the requirements for supporting learning innovation. Innovative learning requires supporting facilities such as technology-based learning media and more flexible learning spaces.

“The current educational facilities and infrastructure at MTs Islamiyah Petangguhan are sufficient to support routine learning activities. The school already has classrooms, a teachers’ room, a principal’s office, and several other supporting facilities. However, when compared to current ideal educational standards, the available facilities still have many limitations,” (FH, Principal, direct interview, January 12, 2026).

This statement indicates that the inadequacy of facilities and infrastructure significantly affects the implementation of learning innovation. From the perspectives of teachers and students, the condition of infrastructure mismatch in supporting learning innovation is as follows:

“The condition of learning facilities and infrastructure at MTs Islamiyah Petangguhan is still relatively simple. Basic facilities such as desks, chairs, whiteboards, and textbooks are available and still in use. However, additional learning media are very limited, causing the learning process in the classroom to rely heavily on teacher explanations and textbooks,” (NM, Teacher 1, direct interview, January 12, 2026).

“The facilities and infrastructure at MTs Islamiyah Petangguhan are still considered basic. Desks and chairs are available, but some are old and not in proper condition. Learning media such as LCD projectors are not available in all classrooms. The classroom conditions are also limited in terms of lighting and ventilation. Overall, the facilities exist but do not fully support optimal learning,” (RHI, Teacher 2, direct interview, January 12, 2026).

“The classroom at MTs Islamiyah Petangguhan is fairly good, but there are still shortcomings. Some desks and chairs are damaged and uncomfortable to use. During the day, the classroom becomes very hot due to insufficient fans. Not all classrooms are equipped with projectors. I feel the facilities are adequate but not complete—if improved, learning would be more comfortable,” (SHT, Student 1, direct interview, January 12, 2026).

“The classroom conditions are quite good for daily learning activities, but it gets hot during the day. There are fans, but they are insufficient for the classroom size. Some desks and chairs are old and damaged. The learning facilities are still simple and not yet complete.” (FAP, Student 2, direct interview, January 12, 2026).

These findings indicate that, based on the perspectives of the principal, teachers, and students, the facilities and infrastructure at MTs Islamiyah Petanggahan are generally available and adequate to support routine daily learning activities. Basic facilities such as classrooms, desks, chairs, whiteboards, and textbooks are already in place and are used in the teaching and learning process. However, in terms of completeness and quality, these facilities are still insufficient to optimally support learning innovation. Some facilities have been used for a long time and are no longer in proper condition. Technology-based learning media, such as LCD projectors, are not available in all classrooms. Additionally, classroom conditions in terms of lighting, ventilation, and air circulation (fans) are still limited. Thus, although the existing facilities can still be used for teaching and learning activities, these limitations become one of the factors affecting teachers' efforts to implement innovative learning in the classroom. Therefore, improvements and upgrades to facilities and infrastructure are necessary to ensure that the learning process becomes more effective, comfortable, and supportive of various innovative teaching methods.

The Role and Actions of the Principal in Managing Educational Infrastructure to Support Learning Innovation

This section presents the research findings regarding the role and actions of the principal in managing educational infrastructure to support learning innovation. The focus of the findings is directed at how the principal responds to the limitations of school facilities and infrastructure in supporting innovative learning. Based on direct interview results from the perspectives of the principal, teachers, and students, the role and actions of the principal are described as follows:

“The principal plays a role in planning, managing, and supervising the use of school facilities and infrastructure. The principal strives to ensure that existing facilities are utilized fairly and equitably. In addition, the principal conducts periodic monitoring of the condition of facilities and infrastructure. The principal also encourages teachers and educational staff to maintain school facilities. Coordination with the school committee is continuously carried out,” (FH, Principal, direct interview, January 12, 2026).

“The principal has a significant role in supporting learning innovation at the school. The principal consistently encourages teachers to try more varied teaching methods and not rely solely on traditional approaches. In every meeting, the principal often emphasizes the importance of keeping

up with current educational developments. Despite limited facilities, the principal continues to motivate teachers to be creative with the available resources," (NM, Teacher 1, direct interview, January 12, 2026).

"The principal plays a role in promoting learning innovation. The principal frequently states in meetings that teachers should be creative and not depend only on lecture-based methods. However, support in terms of facilities is still not optimal. Although the principal has attempted to procure facilities, limitations in funding have prevented equal distribution," (RHI, Teacher 2, direct interview, January 12, 2026).

"The principal shows considerable concern for learning activities at school. The principal often reminds teachers to adopt more creative teaching methods and has organized training sessions for teachers. However, the results have not been fully reflected in classroom practices. Facilities required for modern learning are still lacking," (SHT, Student 1, direct interview, January 12, 2026).

"The principal is firm and attentive to the school. The principal frequently visits classrooms to observe the learning process and occasionally enters classrooms briefly to assess the situation. When there are competitions or new programs, the principal usually provides support. The principal also emphasizes that teachers should teach more creatively," (FAP, Student 2, direct interview, January 12, 2026).

These findings indicate that, based on the perspectives of the principal, teachers, and students, the principal plays a crucial role in supporting learning innovation at MTs Islamiyah Petanggahan. The principal is responsible for planning, managing, and supervising school facilities and infrastructure to ensure their equitable use among all members of the school community. Furthermore, the principal actively monitors facility conditions and coordinates with the school committee to maintain and develop existing infrastructure.

Factors Causing the Mismatch of Educational Infrastructure in Supporting Learning Innovation

This section describes the research findings regarding the factors that cause the mismatch of educational infrastructure in supporting learning innovation. These findings are based on direct interviews conducted with the principal, teachers, and students. From their perspectives, the factors contributing to the mismatch of infrastructure are as follows:

"The main factor causing this mismatch is the limited school budget. The available funds are primarily allocated to basic operational needs. In addition, government support for facilities has not fully met the school's requirements. The rapid development of educational technology also

contributes to the issue, as existing infrastructure often cannot keep pace with these advancements. Environmental and geographical conditions of the school further influence access to adequate facilities. All these factors are interrelated and contribute to the limitations of school infrastructure,” (FH, Principal, direct interview, January 12, 2026).

“The primary factor is the limited school budget, meaning that not all facility needs can be fulfilled quickly. Some learning tools, such as projectors and laboratory equipment, are still limited in number,” (NM, Teacher 1, direct interview, January 12, 2026).

“The rapid development of educational technology is another factor, while the existing school facilities have not fully kept up with these advancements. Some equipment is already available but has not been utilized optimally,” (RHI, Teacher 2, direct interview, January 12, 2026).

“School facilities are still limited. Not all classrooms are equipped with tools such as projectors or modern learning equipment. Some classrooms are also outdated and require renovation, which makes the learning process less comfortable,” (SHT, Student 1, direct interview, January 12, 2026).

“Desks and chairs have been used for a long time, and some are damaged but still in use. Classrooms also feel hot during the day, making learning less comfortable, possibly due to limited school funding for repairs,” (FAP, Student 2, direct interview, January 12, 2026).

These findings indicate that, based on the perspectives of the principal, teachers, and students, the mismatch of educational infrastructure at MTs Islamiyah Petanggahan is caused by several interrelated factors. The most influential factor is the limited school budget, which restricts the ability to fulfill all facility needs promptly, as funds are prioritized for basic operational requirements. Additionally, government support has not fully met the school’s infrastructure needs. The rapid advancement of educational technology also contributes significantly, as existing facilities are not yet able to keep pace with these developments. As a result, modern learning media such as projectors and laboratory equipment remain limited. Furthermore, the condition of facilities that have been used for a long time also contributes to the issue. Some desks and chairs are damaged but still in use, and classroom conditions—particularly high temperatures during the day—reduce comfort in the learning process.

The Impact of Infrastructure Mismatch on the Effectiveness of Learning Innovation

This section presents the research findings regarding the impact of infrastructure mismatch on the effectiveness of learning innovation. The focus of

the findings is directed at how these impacts affect teaching and learning activities in the school. Based on direct interview results from the perspectives of the principal, teachers, and students, the impacts are described as follows:

“Inadequate infrastructure significantly affects the learning process. Teachers actually have many ideas to make learning more engaging. However, due to limited facilities, the implementation of these ideas is not optimal. For example, the use of technology-based learning media is still rarely applied,” (FH, Principal, direct interview, January 12, 2026).

“The condition of infrastructure greatly influences classroom learning. Teachers intend to apply various innovative teaching methods. However, because the available facilities are limited, not all methods can be implemented. For instance, digital media or technology-based learning cannot be fully utilized since not all classrooms are equipped with projectors. As a result, teaching often relies on conventional lecture methods, making the learning process less varied for students,” (NM, Teacher 1, direct interview, January 12, 2026).

“Uncomfortable classroom conditions can affect students’ concentration. If facilities were more complete, learning innovation could be implemented more effectively. Therefore, adequate infrastructure is essential to support more innovative and optimal learning processes,” (RHI, Teacher 2, direct interview, January 12, 2026).

“Classroom conditions that are uncomfortable, especially during hot weather, make students less focused during lessons. Such conditions hinder the implementation of innovative learning. If facilities were more complete, learning activities could be more engaging,” (SHT, Student 1, direct interview, January 12, 2026).

“The school’s internet network is sometimes unstable when used for learning. As a result, technology-based learning activities are often interrupted during the process,” (FAP, Student 2, direct interview, January 12, 2026).

These findings indicate that, based on the perspectives of the principal, teachers, and students, inadequate infrastructure has a significant impact on the effectiveness of learning innovation at MTs Islamiyah Petangguhan. Limited facilities prevent the optimal implementation of creative and innovative teaching ideas. From the teachers’ perspective, the lack of facilities such as projectors, digital media, and other technological tools results in continued reliance on lecture-based methods. Consequently, the learning process becomes less varied and does not fully utilize technology as a learning medium. Furthermore, uncomfortable classroom conditions, such as high temperatures, negatively affect students’ concentration. From the students’ perspective, limited facilities

and unstable internet access also hinder the implementation of technology-based learning. Therefore, it can be concluded that limited infrastructure, uncomfortable classroom conditions, and suboptimal access to technology are key factors affecting the implementation of learning innovation.

Discussion

The findings of this study indicate that educational infrastructure has a significant relationship with the implementation of learning innovation. Although basic facilities are available and can support routine learning activities, they are not yet sufficient to facilitate innovative and student-centered learning. This finding is consistent with Alif et al. (2020) and Suryani and Hamid (2022), who argue that the adequacy of educational infrastructure directly influences the effectiveness of the learning process. Furthermore, the results support the view of Afriansyah and Suryadi (2022) that infrastructure readiness is a crucial prerequisite for implementing innovative learning in schools. In the context of 21st-century education, learning innovation requires not only the availability of physical facilities but also access to digital technologies and flexible learning environments (Utami et al., 2023; Widodo, 2021).

The limitations of infrastructure identified in this study, such as the lack of digital media, projectors, and inadequate classroom conditions, have led teachers to rely on conventional teaching methods. This finding aligns with Hattie (2020), who emphasizes that learning effectiveness is strongly influenced by the quality of the learning environment and available resources. Similarly, the OECD (2020) highlights that schools with limited infrastructure tend to experience lower levels of student engagement and innovation adoption. In Islamic education, this challenge becomes more complex because innovation must also support the integration of religious values and modern knowledge (Nurhadi & Hasanah, 2021). Therefore, the mismatch between infrastructure and learning demands becomes a critical barrier to achieving holistic educational goals.

The study also reveals that classroom comfort plays an important role in supporting learning effectiveness. Inadequate ventilation, limited cooling systems, and damaged facilities negatively affect students' concentration and motivation. This finding is supported by Nabilla et al. (2025), who state that limited infrastructure can reduce students' learning motivation. In addition, Akoso and Tjandra (2024) confirm that the availability of adequate facilities enhances student participation and engagement in the learning process. Thus, improving the physical learning environment is not merely a matter of infrastructure provision but also a strategic effort to enhance students' overall learning experience and outcomes.

Another important finding is the strategic role of the principal in managing educational infrastructure and encouraging learning innovation. The principal's efforts in monitoring, optimizing, and distributing resources reflect effective infrastructure management practices. This is in line with Mulyasa (2020) and Rohmawati (2021), who emphasize that school leaders play a central role in planning and managing educational facilities. Moreover, transformational leadership has been shown to significantly influence school improvement and innovation (Aji et al., 2025; Leithwood et al., 2020). As noted by Fullan (2021), effective school leadership is essential in fostering a culture of change, including encouraging teachers to innovate despite limited resources. Therefore, leadership capacity becomes a key factor in overcoming infrastructure constraints.

However, this study also highlights that infrastructure mismatch is influenced by broader systemic factors, particularly budget limitations and rapid technological development. Limited financial resources restrict schools from upgrading facilities, as funds are often prioritized for operational needs (Prasojo, 2021). In addition, the rapid advancement of digital technology creates a gap between existing facilities and current educational demands (Sofiana et al., 2025; Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi, 2022). This finding reinforces the concept of school innovation management, which emphasizes the importance of aligning resources, leadership, and strategic planning to support sustainable innovation (Masinambow et al., 2025; Sagala, 2020). Therefore, addressing infrastructure mismatch requires not only internal school efforts but also external support from policymakers and stakeholders to ensure the successful implementation of innovative learning.

CONCLUSION

The findings of this study highlight that educational infrastructure plays a crucial role in determining the success of learning innovation. Although basic facilities are available and sufficient for routine learning activities, their limitations—particularly in technology-based media and classroom conditions—significantly hinder the implementation of innovative and student-centered learning. An important insight from this study is that learning innovation does not solely depend on the availability of facilities, but also on how effectively existing resources are managed. In this regard, the principal's leadership emerges as a key factor in optimizing infrastructure and encouraging teachers to adopt creative teaching practices despite constraints. Therefore, the study emphasizes that the integration of adequate infrastructure and adaptive leadership is essential to create effective, engaging, and innovative learning environments.

This study contributes to the field of educational management by providing empirical evidence on the relationship between infrastructure mismatch and learning innovation, particularly within the context of Islamic education. It offers a more integrated perspective by linking infrastructure

conditions, leadership roles, and innovation practices. However, this research is limited by its small number of participants and its focus on a single institutional context, which may affect the generalizability of the findings. Future research is recommended to involve a larger sample size, include multiple schools, and apply mixed-method approaches to gain a more comprehensive understanding of infrastructure management and its impact on learning innovation across diverse educational settings.

REFERENCES

- Afriansyah, A., & Suryadi, A. (2022). Kesiapan infrastruktur sekolah dalam mendukung pembelajaran inovatif. *Jurnal Basicedu*, 6(4), 6238–6247.
- Aji, R. S., Sujarwanto, S., & Prasetyo, A. (2025). Kepemimpinan transformasional kepala sekolah dalam meningkatkan mutu pendidikan. *Al-Rosikhuun: Jurnal Pendidikan Islam*, 4(1), 55–68. <https://doi.org/10.18860/ar.v4i1>
- Alif, M. R., Nurhayati, N., & Fauzan, F. (2020). Pengaruh sarana prasarana terhadap efektivitas pembelajaran di sekolah. *Jurnal Pendidikan dan Pembelajaran*, 7(1), 22–33.
- Akoso, C. G., & Tjandra, D. S. (2024). The influence of facilities and infrastructure on learning effectiveness at Insan Prima Bekasi National School. *Manajia: Journal of Education and Management*.
- De Boer, M., & Zeiler, K. (2024). Qualitative critical phenomenology. *Phenomenology and the Cognitive Sciences*, 1–25. <https://doi.org/10.1007/s11097-024-10034-7>
- Fullan, M. (2021). *Leading in a culture of change* (2nd ed.). John Wiley & Sons.
- Hattie, J. (2020). *Visible learning: Effect sizes when schools are closed*. Routledge.
- Hidayat, Y., Alfiyatun, A., Toyibah, E. H., Nurwahidah, I., & Ilyas, D. (2023). Manajemen pendidikan Islam. *Syi'ar: Jurnal Ilmu Komunikasi, Penyuluhan dan Bimbingan Masyarakat Islam*, 6(2), 52–57. <https://doi.org/10.37567/syiar.v6i2.2214>
- Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. (2022). *Literasi digital dalam pendidikan*. Pusat Penelitian Kebijakan Pendidikan.
- Lael, M. (2025). Manajemen kepala sekolah dalam pengelolaan sarana prasarana pendidikan. *International Journal of Multidisciplinary Research and Analysis*, 6(7), 1021–1030.
- Leithwood, K., Harris, A., & Hopkins, D. (2020). Seven strong claims about successful school leadership revisited. *School Leadership & Management*, 40(1), 5–22. <https://doi.org/10.1080/13632434.2019.1596077>

- Masinambow, R., Tumbel, T., & Wullur, M. (2025). School innovation management dalam meningkatkan kualitas pembelajaran. *Jurnal Inspirasi Manajemen Pendidikan*, 13(1), 1–12.
- Mulyasa, E. (2020). *Manajemen dan kepemimpinan kepala sekolah*. Bumi Aksara.
- Nabilla, R., Lestari, D. A., Hafizah, I., & Kurnia, R. (2025). Dampak fasilitas dan infrastruktur sekolah yang terbatas terhadap motivasi belajar siswa sekolah dasar. *Jurnal Basicedu*, 9(6). <https://doi.org/10.31004/basicedu.v9i6.10865>
- Nurhadi, N., & Hasanah, U. (2021). Inovasi pembelajaran pendidikan Islam di era digital. *Nadwa: Jurnal Pendidikan Islam*, 15(1), 1–18.
- Organisation for Economic Co-operation and Development. (2020). *Education at a glance 2020: OECD indicators*. OECD Publishing.
- Oluka, A. (2025). Phenomenological research strategy: Descriptive and interpretive approaches. *F1000Research*, 14, 725. <https://doi.org/10.12688/f1000research.166273.1>
- Pregoner, J. D. (2024). Research approaches in education: A comparison of quantitative, qualitative and mixed methods. *IMCC Journal of Science*, 4(2), 31–36. <https://doi.org/10.65931/x1r6v8n4>
- Prasojo, L. D. (2021). Manajemen pembiayaan pendidikan. *Jurnal Manajemen Pendidikan*, 13(2), 85–97. <https://journal.uny.ac.id/index.php/jmp/article/view/40123>
- Rohmawati, N. (2021). Manajemen sarana dan prasarana oleh kepala sekolah. *International Journal of Educational Management and Innovation (IJEMI)*, 3(2), 123–134. <https://journal2.uad.ac.id/index.php/ijemi/article/view/1516>
- Sagala, S. (2020). *Manajemen strategik pendidikan*. Alfabeta.
- Sofiana, A., Lubis, E., Agustina, K., & Fajriyah, R. (2025). Kurikulum Merdeka dan literasi digital: Evaluasi infrastruktur dan sumber daya sekolah. *Jurnal Ilmiah Wahana Pendidikan*, 11(11.D).
- Suryani, N., & Hamid, A. (2022). Infrastruktur pendidikan dan implikasinya terhadap mutu pembelajaran. *Jurnal Pendidikan Islam*, 11(2), 145–160.
- Utami, S., Rahmawati, D., & Lestari, N. (2023). Kesesuaian infrastruktur sekolah terhadap inovasi pembelajaran abad 21. *Jurnal Ilmu Pendidikan Dasar*, 8(3), 201–214.
- Widodo, H. (2021). Inovasi pembelajaran dan tantangannya di sekolah. *Jurnal Pendidikan*, 22(1), 45–58.