



PRINCIPAL MANAGEMENT STRATEGY FOR OPTIMIZING EDUCATIONAL FACILITIES AND INFRASTRUCTURE IN INDONESIAN SCHOOLS IN MAKKAH

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Abstract

This study aims to describe educational facilities and infrastructure while analyzing the principal's management strategies in planning and optimizing them at the Indonesian School of Makkah (SIM). Effective management is crucial to support learning quality while complying with both Indonesian National Education Standards and Saudi Arabian regulations. Using a qualitative case study approach, data were gathered through interviews, observations, and documentation, then analyzed using the Miles, Huberman, and Saldaña model. Results indicate SIM's infrastructure is adequate but not optimal, requiring improvements in the science laboratory, sports facilities, and library collections. The principal executed structured, participatory, and adaptive planning strategies through data-based needs analysis, budget prioritization, and regulatory adjustments. Optimization strategies included effective space utilization, preventative maintenance, rapid damage reporting, external collaboration, library digitization, and flexible classrooms. This study concludes that principal management strategies play a vital role in maintaining infrastructure functionality and improving learning quality in overseas Indonesian schools facing spatial and regulatory constraints.

Keywords: facilities and infrastructure management, principal strategy, Indonesian Schools Abroad, Indonesian School of Makkah.

Abstrak

Penelitian ini bertujuan mendeskripsikan sarana dan prasarana serta menganalisis strategi manajemen kepala sekolah dalam merencanakan dan mengoptimalkannya di Sekolah Indonesia Makkah (SIM) sebagai Sekolah Indonesia Luar Negeri (SILN). Pengelolaan efektif sangat krusial untuk mendukung mutu pembelajaran di tengah tuntutan kepatuhan terhadap Standar Nasional Pendidikan Indonesia dan regulasi Arab Saudi. Penelitian kualitatif studi kasus ini mengumpulkan data melalui wawancara, observasi, dan dokumentasi, yang dianalisis menggunakan model Miles, Huberman, dan Saldaña. Hasil penelitian menunjukkan sarana prasarana SIM tergolong memadai namun belum optimal; fasilitas seperti laboratorium IPA, sarana olahraga, dan koleksi perpustakaan memerlukan peningkatan. Kepala sekolah menerapkan strategi perencanaan yang terstruktur, partisipatif, dan adaptif melalui analisis kebutuhan berbasis data, prioritas anggaran, dan penyesuaian regulasi lokal. Optimasi dilakukan melalui pemanfaatan ruang efektif, pemeliharaan preventif, pelaporan kerusakan cepat, kolaborasi eksternal, digitalisasi perpustakaan, serta ruang kelas fleksibel. Strategi manajemen ini terbukti krusial menjaga fungsionalitas fasilitas dan meningkatkan mutu pembelajaran SILN.

Kata Kunci: manajemen sarana prasarana, strategi kepala sekolah, Sekolah Indonesia Luar Negeri, Sekolah Indonesia Makkah.



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INTRODUCTION

Based on the Indonesian Government Regulation Number 19 of 2005 concerning National Education Standards and the Regulation of the Minister of National Education of the Republic of Indonesia Number 24 of 2007 concerning Facilities and Infrastructure Standards for Elementary Schools/Islamic Elementary Schools, Middle Schools/Islamic Junior High Schools, and High Schools/Islamic Senior High Schools, efforts to achieve the established educational targets require strategic contributions from the school principal.¹ The principal's strategy is a key factor in mobilizing school resources to realize the vision, mission, goals, and educational targets set by the educational institution.

The educational environment in Indonesia continues to evolve and faces various challenges in efforts to improve its quality. One important aspect influencing educational quality is the availability and utilization of adequate educational facilities and infrastructure. Good educational facilities and infrastructure create a conducive learning environment, provide the necessary support for the learning process, and influence the quality of students' learning experiences and teacher performance.²

As a leader in an educational institution, the strategies implemented by the principal will have a significant, even critical, impact on the school's progress. The principal plays a strategic role in achieving educational goals. A principal's responsibilities are not light, as in addition to carrying out educational functions, they are also responsible for planning and providing educational facilities and infrastructure. Educational facilities and infrastructure are resources that must be continuously improved, both in terms of quality and quantity, to support students in facing rapid technological developments.³ Therefore, careful and ongoing planning in managing educational facilities and infrastructure is crucial for the smooth running of the teaching and learning process. In this regard, the principal's managerial role is crucial.

The principal as the main leader in an educational institution plays a key role in the management of facilities and infrastructure.⁴ They are responsible for managing existing resources, identifying issues related to facilities and infrastructure, and designing and implementing strategies to improve the condition of educational facilities. However, in many schools in Indonesia, issues related to educational facilities and infrastructure remain a relevant issue. Inadequate physical

¹ Indarwan, "Implementasi Permendiknas No. 24 Tahun 2007 Tentang Standar Sarana Dan Prasarana Pada MTsAl-Ihsaniyah Dan MTsAisyiyah1 Palembang," *Studia Manageria* 1, no. 24 (2019): 147–62.

² Muhammad Fadhli, "Implementasi Manajemen Strategik Dalam Lembaga Pendidikan," *Ontinuous Education: Journal of Science and Research* 1, no. 1 (2020): 11–23.

³ Ni Putu Yuniarika Parwati, "Strategi Guru Sejarah Dalam Menghadapi Tantangan Pendidikan Indonesia Di Era Society 5.0," *Widyadari* 22, no. 1 (2021): 143–58, <https://doi.org/10.5281/zenodo.4661256>.

⁴ Inge Kadarsih et al., "Peran Dan Tugas Kepemimpinan Kepala Sekolah Di Sekolah Dasar," *EDUKATIF: Jurnal Ilmu Pendidikan* 2, no. 2 (2020): 194–201.

facilities, lack of facility maintenance, and ineffective management can hinder the teaching and learning process and the overall quality of education.⁵

Problems related to facilities and infrastructure are not only a common problem in educational institutions located in remote or rural areas. Even in urban areas, many schools experience serious challenges related to the very limited and concerning condition of facilities and infrastructure. These obstacles include inadequate classrooms, a lack of facilities such as libraries, laboratories, sports facilities, and so on. Educational facilities and infrastructure play a crucial role in supporting the teaching and learning process in schools.

The quality of educational programs in schools is greatly influenced by the condition and optimal management and utilization of the school's educational facilities and infrastructure. The availability of these facilities and infrastructure is also a key indicator in assessing a school's quality. School quality can be measured by the completeness of the educational facilities and infrastructure that support the learning process.⁶ The better and more complete the educational facilities and infrastructure at a school, the better the public's perception of the school's quality.

To ensure that the educational facilities and infrastructure required by schools operate effectively to support the learning process, the involvement of school community members, including principals, teachers, and administrative staff, who have a deep understanding and professional skills in managing educational facilities and infrastructure is required. The main obstacles faced by schools in developing educational facilities and infrastructure are financial constraints, a mismatch between existing facilities and school needs, and availability that does not match the number of students and teachers. These obstacles often arise from a lack of awareness among all components in the school of the importance of developing educational facilities and infrastructure in an appropriate manner.

The quality of a school is also reflected in the completeness of its facilities and infrastructure. Adequate facilities have a positive impact on student achievement. For example, a computer lab can improve students' typing and computer skills. Sports facilities also provide opportunities for students to hone their athletic skills, opening up wider opportunities for achievement.

The availability and compliance with standards of facilities and infrastructure in accordance with applicable regulations is a very important component in supporting effective education

⁵ Dihadi Rahadi Sahid and Elly Resli Rachlan, "Pengelolaan Fasilitas Pembelajaran Guru Dalam Meningkatkan Mutu Pembelajaran Pendidikan Jasmani Di Sekolah Menengah Kejuruan (SMK)," *Indonesian Journal of Education Management & Administration* 3, no. 1 (2019).

⁶ Mihmidaty Ya'cub, "Strategi Kepala Sekolah Dalam Meningkatkan Kualitas Pembelajaran Melalui Pengembangan Sarana Prasarana," *Munaddhomah: Jurnal Manajemen Pendidikan Islam* 2 (2021): 60–69.

management.⁷ Furthermore, in a school environment like the Makkah Indonesian School, the completeness of facilities and infrastructure is a contributing factor to school recognition and student achievement. It can be concluded that the planning and procurement strategies developed by the principal and his staff also play a significant role in achieving school achievement.

In addition to observing significant student achievement and the availability of adequate educational facilities and infrastructure, the researcher felt compelled to conduct research at this school. In this context, the author sought to delve deeper into the strategies used by the principal in planning and procuring educational facilities. Therefore, this research is entitled "Principal Management Strategies for Optimizing Educational Facilities and Infrastructure at the Indonesian School of Makkah."

RESEARCH METHODS

This research approach uses a qualitative approach. This means that the data observed is current data, requiring direct observation.⁸ This research uses a qualitative approach with a case study. This qualitative approach was chosen because this research aims to deeply understand the processes, strategies, and practices of facility and infrastructure management carried out by school principals in a natural context. Data was obtained through interviews, observations, and documentation studies, then analyzed.

RESULTS AND DISCUSSION

Condition of Educational Facilities and Infrastructure at Indonesian Schools in Makkah

The research results obtained through direct observation and in-depth interviews with various informants show that the condition of facilities and infrastructure at the Makkah Indonesian School (SIM) is at The category is quite adequate, although there are still several aspects that require improvement.

⁷ Adriana Hanny Bella Sukma, "Manajemen Keuangan Sekolah Dalam Pemenuhan Sarana Prasarana Pendidikan Di Bekasi," *Al-Fâhim: Jurnal Manajemen Pendidikan Islam* 4, no. 1 (2022): 45–57, <https://doi.org/10.54396/alfahim.v4i1.226>.

⁸ Burhan Burgin, *Penelitian Kualitatif* (Kencana Prenada Media Group, 2012).



Figure 2. Photo of the Indonesian School of Mecca

Observations indicate that classrooms are equipped with desks, chairs, whiteboards, LCD projectors, and air conditioning. However, the relatively limited space requires frequent adjustments to seating arrangements. This is consistent with an interview with the principal.

"In general, our infrastructure is quite adequate. Classrooms are equipped with LCDs and air conditioning, but they are not very large, so they need to be arranged to ensure student comfort." (Interview with Principal)

Information about the condition of the classroom was also confirmed by a student who served as a resource person, "The classroom is comfortable, but it's a bit cramped during group work. But the air conditioning is cool, so it's still comfortable to study." (Student Interview).



Figure 3. Classroom

In addition to classrooms, the school also has two laboratories: a science lab and a computer lab. Observations indicate that the computer lab is quite well-equipped, but the number of devices is insufficient to accommodate all students, requiring two sessions. The science teacher explained the use of these laboratories during an interview.

"The science lab is already there, but some of the lab equipment is broken or incomplete. Sometimes we have to modify the equipment to keep the labs running."
(Science Teacher Interview)

The school also has a library, which is quite comfortable, but the book collection is not very diverse. There is a catalog computer and a reading area, but the library space is not very spacious. "The collection is quite good, but it needs a lot of additions, especially reference books and a digital library." (Librarian Interview). The school also has supporting facilities for sports activities, although due to limited space, SIM does not yet have a large field. Sports activities are held in the multipurpose hall or a small area in the courtyard of the Indonesian Consulate General.

This is in accordance with the information conveyed by the Sports Teacher, that sports are adapted to environmental conditions. Available "We have to adjust sports activities because of limited space. But so far students can still be active." (Teacher Interview). In addition, from the author's observations in the field, it was found that the school also has other facilities in the form of a prayer room, a health unit, and also health equipment, although the number is limited. Supporting infrastructure at the school includes stable internet access, but some rooms have signal blind spots. The cleanliness of the school environment is very well maintained because there are permanent cleaning staff.

From the findings obtained, it can be seen that the condition of the facilities and infrastructure at the Makkah Indonesian School is quite adequate and capable of supporting learning, however, several facilities require maintenance or improvement, especially laboratories, libraries, and sports facilities.

Principal's Strategy in Planning Infrastructure Facilities

The planning strategy for facilities and infrastructure at the Makkah Indonesian School (SIM) shows a systematic, participatory and adaptive work pattern. The context of Indonesian schools abroad. Based on interviews, field observations, and a review of official school documents such as the school work plan (RKAS), inventory reports, and minutes of infrastructure meetings, five main components of the planning strategy implemented by school principals were identified.

1. Formulation of Vision and Development Priorities

Infrastructure planning begins with the formulation of a strategic vision, which serves as the primary direction for school facility development. The principal emphasizes that infrastructure development must be relevant to the context of the National Student Development Plan (SILN), the demands of 21st-century learning, the sustainability of educational service quality, and operational challenges in the host country. Observations of annual planning meetings indicate that the principal focuses on three priority areas:

- a. Improving classroom comfort,
- b. Strengthening ICT learning facilities,
- c. Rejuvenation of laboratory equipment.

This was confirmed in an interview with the principal, who stated, "Every year we evaluate infrastructure needs. Our priorities are classroom comfort, strengthening ICT facilities, and updating lab equipment." (Principal Interview). The Annual Work Plan (RKT) document also demonstrates a consistent focus on modernizing ICT infrastructure, such as replacing old projectors, adding access points, and upgrading computer equipment for teachers. This demonstrates alignment between the planning vision and implementation on the ground.

2. Data-Driven Needs Analysis

The next step is a comprehensive analysis of infrastructure needs using various data sources. Based on document analysis, SIM has routine inventory procedures in place, including damage reports, semester evaluation sheets, and records of teacher facility usage.

The vice principal for infrastructure explained this process in detail: "We conduct an inventory every semester and check the condition of each facility individually. Teachers can also submit requests via Google Form." (Interview with Principal for Infrastructure)

Researchers' observations in the infrastructure room showed that the inventory list was updated digitally using a simple recording system, complete with photos of the latest condition of each facility. Furthermore, teachers provided input through learning needs sheets, students submitted facility complaints through a public service box, and infrastructure staff conducted physical inspections every six months. This data-driven needs analysis ensured that planning was not based on estimates but rather on the actual conditions of the facilities on the ground.

3. Budget Preparation and Priority Scale Determination

The infrastructure budget is compiled through integration with the School Activity and Budget Plan (RKAS). The last year's RKAS document shows that the infrastructure budget is allocated based on the level of urgency, the facility's capacity to support the learning process, and the availability of funding sources (BOS, support from the Indonesian Consulate General, or other assistance). The principal stated, "Not all needs can be met immediately. We look at what is most urgent and most frequently used by students." (Interview with Principal)

Observations from the RKAS meeting showed that facilities experiencing severe damage, such as frequently failing air conditioners or unstable classroom chairs, received first priority. Facilities supporting 21st-century learning, such as interactive displays, were

also considered high priority. Budgeting was conducted realistically, combining needs, funding, and urgency.

4. School Community Perspectives in Planning

Infrastructure planning at SIM is participatory. Teachers, staff, students, and parents are involved in the process of developing infrastructure needs. This involvement occurs during plenary teacher meetings at the beginning of the semester, completing learning media requirements forms, participating in parent discussion forums during school committee activities, and conducting facility satisfaction surveys.

One teacher stated, "We're asked to fill out the media requirements at the beginning of each semester, so we feel involved." (Teacher Interview). The researcher's observation notes in the teachers' lounge indicate that the teachers' lists of learning media requirements were reviewed by the infrastructure team before being included in the draft RKAS. This demonstrates that the planning process is open and proportionate. This involvement also has a positive psychological impact: teachers feel valued and have ownership of the school's facilities.

5. Compliance with Saudi Arabian Regulations

As an Indonesian school abroad, SIM must align its entire infrastructure procurement process with host country regulations. Documentation studies indicate that procurement must comply with Saudi Arabian customs regulations and the Indonesian Ministry of Foreign Affairs' regulations regarding shipments to Indonesian representative offices. The principal explained, "Not all equipment can be shipped from Indonesia without permission. So we must ensure procurement complies with Saudi Arabian regulations." (Principal Interview). Furthermore, the researcher's observations revealed several consequences of these regulations:

- a. Certain electronic goods cannot be imported without certification.
- b. Local procurement is often the primary option despite the higher prices.
- c. Schools must coordinate with the Indonesian Consulate General for administrative compliance.

These regulatory adjustments have made the infrastructure planning strategy at the Indonesian School in Makkah more cautious and adaptive to the characteristics of Indonesian schools abroad (SILN). The principal and the infrastructure team not only considered the school's internal needs but also had to navigate various procurement regulations set by the Saudi Arabian government, including customs regulations, import permits for electronic goods, and security standards applicable in the host country. Observations indicated that some infrastructure needs had to be shifted from direct

procurement in Indonesia to local purchases, despite the consequences of increased costs and limited product choices.

A review of the RKAS documents and communications reports with the Indonesian Consulate General also revealed that each shipment of certain goods requires administrative confirmation before it can be processed. This situation requires careful planning, careful budgeting, and flexibility in determining priorities, ensuring that infrastructure development strategies can remain effective without violating applicable regulations in the host country.

The principal's strategy for planning infrastructure at the Indonesian school in Makkah is systematic, participatory, and adaptive, reflecting the alignment between learning needs, field conditions, and the operational dynamics of Indonesian schools abroad. Findings from observations, in-depth interviews, and document studies such as the school's work plan (RKAS), inventory reports, and minutes of infrastructure meetings indicate that the principal's planning strategy focuses not only on providing facilities but also on the school's ability to balance various determining factors.

Principal's Strategy in Optimizing Facilities and Infrastructure

Based on observations, interviews, and document studies at the Indonesian School of Makkah (SIM), the optimization of facilities and infrastructure was carried out through a comprehensive and sustainable approach. This strategy emphasized not only efficient facility utilization but also a maintenance system, damage reporting mechanisms, strengthened external collaboration, and innovative developments appropriate to the educational context abroad.

The principal acts as the primary director, ensuring all resources support the learning process despite physical limitations, host country regulations, and the dynamic needs of students. The research shows that this optimization strategy is effective because it is supported by a culture of open communication, a structured work system, and strong participation from the entire school community, including teachers, administrative staff, parents, and the Indonesian community network in Mecca.

1. Effective Facility Formulation

Field observations indicate that learning spaces at SIM are relatively limited compared to the number of educational activities they must accommodate. To address this, the school implements adaptive and flexible space management. Multipurpose rooms are used for a variety of activities, including ICT learning, extracurricular activities, teacher meetings, and student training.

Furthermore, the space scheduling mechanism is coordinated by the Administration (TU). Each teacher can access the weekly schedule to prevent overlapping space usage. Interviews with ICT teachers revealed that "The computer lab is used alternately. The schedule is created by the TU and so far it's working well." Documentary studies of space usage schedules indicate a standardized and fair allocation of time across all subjects.

2. Periodic Maintenance

Facility maintenance is carried out in a preventative and routine manner. Observations noted that the school has a regular schedule for air conditioning checks, room cleanliness, and laboratory equipment maintenance. This system helps prevent major damage that could potentially disrupt the teaching and learning process. The principal explained that "the air conditioning is checked every two months, the electrical installation is inspected by a local technician, and the lab equipment is cleaned regularly." Furthermore, the administration staff reinforces the maintenance process by responding quickly to damage reports. "If there is damage, teachers report it via the WhatsApp group. We usually check it out the same day."

Observation reports show that maintenance lists are posted on internal information boards as reminders for staff.

3. Damage Reporting System

Field observations show that the learning spaces in SIM are relatively

Damage reporting is handled through three mechanisms: a damage report book, a digital form, and rapid communication through an internal WhatsApp group. The digital reporting system is considered the most effective because it simplifies data recapitulation and expedites follow-up. The Deputy Principal of Facilities and Infrastructure confirmed the effectiveness of the new system, saying, "Now we use Google Forms for damage reports. They enter the system faster." A report summary document from the last six months shows that over 70% of reports were handled in less than 48 hours, reflecting the responsiveness of the facilities and infrastructure team.

4. External Collaboration

Facing limited authority within private schools abroad, collaboration is key to optimizing infrastructure. This collaboration is carried out by:

- a. Indonesian Consulate General in Jeddah, especially for large facility procurement and space renovation.
- b. Indonesian citizen community in Mecca, which helps with mutual cooperation activities, stationery donations, or supporting facilities.

- c. Local service providers, especially in technical services such as AC repair, electrical installation, and furniture procurement.

The principal stated that, "For large facilities, we coordinate with the Indonesian Consulate General. They help if there are renovations or equipment procurement needs." Parental participation is also significant, as revealed in an interview, "We were once invited to work together to clean the classrooms. That's good for fostering a sense of ownership." Observations during the "Clean Saturday" activity showed active parental involvement in repainting the walls and fireplace in the school garden.

5. Innovation in Facilities and Infrastructure Development

In addition to maintaining existing facilities, the school also implements innovative developments to meet modern learning needs and local constraints. Some innovations identified in document studies and interviews include:

- a. Digitization of Library Catalog. Access to books is made easier through a simple, in-house application-based search system.
- b. Utilization of Online Learning Platforms. Use of Google Classroom, Edmodo, and video conferencing applications for distance or collaborative learning.
- c. Flexible Classroom Design. Tables and chairs are rearranged according to activity needs, such as group discussions, practicals, or presentations.
- d. Simple Teaching Aids Innovation. Teachers often make teaching aids from local materials because it is difficult to obtain manufactured teaching aids in Saudi Arabia.

Teacher interviews corroborated this finding, stating, "We often make our own teaching aids when manufactured equipment is difficult to obtain in Saudi Arabia." Observations further revealed that some science teaching aids were made from cardboard, small pipes, and recycled materials, yet remained functional in supporting learning. Overall, the principal's strategy for optimizing facilities and infrastructure at SIM was effective, supported by thorough planning, routine maintenance, and the use of a modern reporting system, enabling a swift and measurable response to any issues.

This effectiveness is further strengthened by the school's extensive collaboration with various parties, including the Indonesian Consulate General, the Indonesian community, local service providers, teachers, administrative staff, and parents, allowing the school to rely not only on internal resources but also optimally utilize external support. This adaptive and innovative approach demonstrates that even though the school is located in another country and must adapt to various limitations in space, regulations, and access to

facilities, learning services can still be optimally implemented through professional, participatory, and responsive infrastructure management.

DISCUSSION

Condition of Educational Facilities and Infrastructure at Indonesian Schools in Makkah

Research findings regarding the condition of facilities and infrastructure at the Makkah Indonesian School (SIM) show that the school facilities are in the fairly adequate category, but still face limitations in space, completeness of equipment, and capacity certain facilities. This situation illustrates that the provision of infrastructure in Indonesian schools abroad faces geographical, regulatory, and budgetary challenges, yet they are still able to fulfill their basic function of supporting the learning process. This finding can be linked to various previous theories and research to deepen its academic interpretation.

1. Adequate Facilities and Infrastructure to Support Learning

Observations show that classroom facilities meet basic learning requirements, such as desks, chairs, whiteboards, LCD projectors, and air conditioning. Learning facilities must, at a minimum, support comfort, visibility, and teacher-student interaction. The presence of air conditioning, a necessity in a hot climate like Mecca, also demonstrates the school's efforts to adapt facilities to the environmental context.⁹

However, limited classroom space limits flexibility in spatial planning. Educational institutions often face a mismatch between student numbers, available space, and the nature of cooperative learning activities, which require more space.¹⁰ Student quotes that the class was “a bit cramped during group work” reinforce that the learning space does not fully support ideal collaborative activities.

This condition shows that even though the facilities at SIM are available and functioning, in terms of quality and pedagogical suitability they still require improvement to fulfill the principles of student-centered learning as recommended by modern learning theory (Arends, 2012).

2. Science and Computer Laboratory Conditions: Relevance to the Quality of Science and Technology Learning

The presence of science and computer laboratories is an added value for the SIM. However, some science equipment is damaged, and the number of computers is insufficient for a full session. This situation aligns with the Ministry of National Education's (2007)

⁹ Khusnul Khotimah Dewi, “Manajemen Sarana Dan Prasarana Ruang Kelas Dalam Mendukung Pembelajaran Di MAN 2 Karawang,” *Jurnal Riset Rumpun Ilmu Pendidikan* 4, no. 1 (2025): 601–14.

¹⁰ Restalia et al., “Revitalisasi Strategi Pembelajaran Kooperatif: Optimalisasi Kolaborasi Kegiatan Siswa Dalam Pembelajaran,” *Jurnal Inovasi Strategi Dan Model Pembelajaran* 5, no. 2 (2025): 91–98.

statement that incomplete or poorly maintained laboratories can hinder the achievement of practical competencies.

The quality of science learning is greatly influenced by the completeness of laboratory equipment; schools with adequate laboratory facilities tend to produce better conceptual understanding.¹¹ Science teachers who “have to modify tools” reflect a form of professional adaptation, but at the same time emphasize that ideal support facilities have not been met.

In the computer lab, session allocation indicates that facility capacity has not kept pace with the number of students. Limited ICT equipment often hinders the implementation of digital learning, especially in schools with limited budgets.¹²

3. School Libraries: Collection Adequacy and Space Limitations

The SIM Library now has a computer catalog and a reading room, indicating modern management efforts. However, its limited collection and limited space indicate that the library has not yet fulfilled its strategic function as a learning resource center. The library's limited collection limits student literacy and the variety of learning resources.¹³

Libraries that still focus on print collections also show the need to develop digital library materials, as suggested by IFLA (2015) that school libraries in the digital era must provide access to electronic learning resources to expand the reach and efficiency of space utilization.

The librarian's quote mentioning the need for "additional reference books and digital libraries" reflects the need for library transformation in line with the 21st century literacy paradigm.

4. Sports Facilities and Land Limitations

Limited space means SIM lacks adequate fields, so sports activities are held in multipurpose halls or small courtyards. This finding is very common in schools in urban areas with limited space, as noted by Cushman (2013), who stated that schools in densely populated areas often sacrifice sports facilities for academic space.

This situation is reinforced by research by Nugraha (2018), which shows that limited sports facilities impact the variation in students' physical activity. However, schools

¹¹ Mustika et al., “Sarana Dan Prasarana Dalam Meningkatkan Kualitas Pembelajaran Berdasarkan Kajian Literatur Terkini Tahun 2020-2025: A Systematic Literature Review (SLR),” *Jurnal Pendidikan MIPA* 15, no. 2 (2025): 562–68.

¹² Jannah et al., “Penerapan Inovasi Manajemen Sarana Dan Prasarana Untuk Mendukung Pembelajaran Berbasis Digital Pada Sekolah,” *PERMAI: Jurnal Pendidikan Dan Literasi Madrasah Ibtida'iyah* 4, no. 2 (2025): 86–96.

¹³ Dian Hidayah and Hasanah Enung, “Optimalisasi Pelaksanaan Layanan Perpustakaan Untuk Meningkatkan Literasi Siswa,” *Academy of Education Journal* 15, no. 2 (2024): 1504–14.

can adapt programs to maintain student physical engagement. This is reflected in statements by sports teachers who stated that they "adjust activities to keep students active," indicating the existence of mitigation strategies.

5. Supporting Facilities: Prayer Room, UKS, and Internet Access

The presence of a prayer room, school health center, health facilities, and internet access demonstrates that SIM meets the minimum standards for a healthy school as stipulated by Minister of National Education Regulation No. 24 of 2007. However, the discovery of signal blind spots indicates that ICT infrastructure is still suboptimal. This condition aligns with research by Sari, which found that uneven internet quality within schools hinders the effective use of digital devices in learning.

Efforts to maintain environmental cleanliness by cleaning staff also indicate that the school has implemented the principle of a hygienic learning environment, cleanliness and tidiness of the room have an impact on students' focus and learning comfort.¹⁴

Overall, the research findings indicate that the infrastructure at the Indonesian School in Makkah is "quite adequate," but has not yet reached the optimal level. This condition aligns with the concept of infrastructure effectiveness in educational management, which emphasizes that availability alone is not enough; quality, completeness, and sustainable maintenance must go hand in hand.

Limited space, incomplete laboratory equipment, minimal library collections, and limited sports facilities are issues that can theoretically be categorized as facility constraints, namely conditions in which the function of infrastructure is still running but does not yet support learning optimally.

Thus, the results of this study strengthen the theory that infrastructure plays an important role in improving the quality of learning, but its effectiveness is largely determined by aspects of completeness, maintenance, space capacity, and relevance to modern learning needs.

Principal's Strategy in Planning Facilities and Infrastructure

The principal's strategy in planning facilities and infrastructure at the Indonesian School of Makkah (SIM) demonstrates the implementation of systematic, participatory, and adaptive infrastructure management, in accordance with the characteristics of Indonesian schools operating within the regulatory and cultural context of the host country. The findings of this study align with

¹⁴ Misbahul Husna, "Hubungan Antara Fasilitas Dan Lingkungan Fisik Sekolah Terhadap Motivasi Belajar Siswa," *Ainara Journal (Jurnal Penelitian Dan PKM Bidang Ilmu Pendidikan)* 6, no. 2 (2025): 302–12.

the principles of educational infrastructure management that emphasize the importance of needs-based planning, stakeholder involvement, and policy adjustment to the external environment.

1. Formulation of Vision and Development Priorities

The research results show that principals begin the planning process by formulating a strategic vision for infrastructure, which is aimed at improving classroom comfort, modernizing ICT, and renovating laboratories. Infrastructure planning must be aligned with the institution's vision and the needs of 21st-century learning, which demands modern facilities responsive to technological developments.¹⁵

This vision alignment is also consistently evident in the RKT document and meeting observations, which demonstrate a focus on replacing ICT equipment and increasing internet access. This aligns with Rahmawati's findings that effective schools are those that integrate ICT needs into infrastructure planning to improve the quality of digital learning.

The principal's interview excerpts emphasizing annual priorities reinforce that the planning process is not reactive, but rather purposeful and based on regular evaluation. Effective educational leadership consistently evaluates strategic needs as the basis for developing facility plans.¹⁶

2. Data-Driven Needs Analysis

The infrastructure needs analysis conducted by SIM was driven by digital inventories, damage reports, teacher input, and routine inspections. These findings align with the data-driven planning principle proposed by Caldwell & Spinks, which states that effective schools rely on objective data to determine facility needs for more accurate and accountable decisions.

A previous study by Sari also found that infrastructure planning using digital reporting instruments increased the accuracy of budget allocation and the speed of facility repairs.

An interview with the vice principal for infrastructure (“We do an inventory every semester...”) showed that SIM has implemented a systematic monitoring and evaluation mechanism. This approach aligns with the continuous improvement model in educational quality management, which emphasizes routine monitoring of facility conditions.

¹⁵ Salsabiiliana Putri Sajdah, “Manajemen Sarana Prasarana Berbasis Teknologi Untuk Pembelajaran Abad 21,” *Jurnal Manajemen Dan Pendidikan Agama Islam* 3, no. 1 (2025): 77–94.

¹⁶ Nur Efendi and Muh Ibnu Sholeh, “Manajemen Pendidikan Dalam Meningkatkan Mutu Pembelajaran,” *Academicus: Journal of Teaching and Learning* 2, no. 2 (2023): 68–85.

3. Budget Preparation and Priority Scale Determination

Infrastructure planning in SIM is strongly integrated with the RKAS (Work Plan and Budget), where priority setting takes into account urgency, utilization levels, and available funding sources. This aligns with the concept of education budget efficiency, where planning must consider financial capacity and maximize impact on learning activities.

Wulandari's research found that schools that prioritize essential needs, such as air conditioning repairs and safety equipment, tend to have higher levels of student and teacher satisfaction. The findings of this study demonstrate a consistent pattern: facilities that best support learning activities, such as air conditioning and classroom chairs, receive the highest priority.

The principal's statement that not all needs can be met also supports the principle of priority-based budgeting, which emphasizes that infrastructure planning strategies must measure the relative benefits of each need.

4. Involvement of School Community in Planning

The participation of teachers, students, staff, and parents in planning shows that SIM applies the principle of shared decision making as stated by Owens & Valesky that stakeholder involvement in decision making increases the sense of ownership and accuracy of planning.

The findings of this study are consistent with the results of Pratiwi's research which stated that schools with participatory infrastructure planning processes have higher levels of infrastructure program implementation and minimize resistance.

A teacher's quote ("We were asked to fill out the media requirements at the beginning of each semester...") demonstrates that involvement is not merely a formality, but an integral part of the planning document development process. Observations showing ongoing reviews by the infrastructure team also support the effectiveness and transparency of this mechanism.

5. Compliance with Saudi Arabian Regulations

This component is a key finding that distinguishes SIM from other schools in Indonesia. Infrastructure planning at overseas educational institutions must navigate customs regulations, shipping permits, electronic goods certification, and host country operational regulations. This finding reinforces the theory of context-based educational management, which states that educational management must be sensitive to the socio-political context of its operational environment.

This adjustment to regulations is also supported by the findings of Haryanto who studied infrastructure management at the Indonesian School in Bangkok, where the procurement process must refer to local regulations, thus requiring intensive adaptation and coordination with the Indonesian representative office.

Researchers' observations of the high prices of local goods and product limitations suggest that infrastructure planning at SILN must be adaptive and flexible to address import restrictions. This aligns with Robbins & Coulter's view that organizations operating in a tightly regulated context must have a contingency planning strategy.

Based on this description, it can be concluded that adapting to host country regulations is a key factor distinguishing infrastructure planning at the Indonesian School in Makkah from schools in the country. The complexity of customs regulations, import licensing, and certification and security standards in Saudi Arabia requires schools to implement infrastructure planning much more carefully, strategically, and responsively to external dynamics. This finding confirms the principle of context-based educational management, which states that educational management must be adapted to the socio-political context in which the institution operates.

This situation also reinforces Haryanto's research findings that Indonesian schools abroad require intensive coordination with Indonesian representatives and adaptation to local regulations in every procurement process. Furthermore, field observations regarding the high cost of local products and the limited availability of goods indicate that infrastructure planning must be adaptive and flexible, aligning with Robbins & Coulter's view of the importance of contingency strategies in a strict regulatory environment.

Overall, the infrastructure planning strategy at SIM is not only oriented towards fulfilling internal needs, but is also built through the ability to navigate and adapt to external regulations, making it more complex but at the same time more mature and contextual than schools in the country.

Principal's Strategy in Optimizing Facilities and Infrastructure

The principal's strategy for optimizing facilities and infrastructure at the Makkah Indonesian School (SIM) demonstrates an adaptive, collaborative, and contextual leadership style. The optimization approach encompasses not only facility utilization but also maintenance, reporting systems, external collaboration, and infrastructure innovation. This overall strategy aligns with the principles of modern educational infrastructure management, which emphasize efficiency, sustainability, and contextual appropriateness.

1. Effective Utilization of Facilities

Research findings indicate that SIM implements adaptive space management to address infrastructure limitations. This flexible space management aligns with the concept of effective learning space management. Learning spaces need to be designed and managed in a multifunctional manner to accommodate a variety of contemporary learning activities.¹⁷

SIM's space utilization model, which maximizes the use of multipurpose rooms for ICT activities, meetings, and extracurricular activities, aligns with Nugroho's research in densely populated urban schools in Indonesia, which found that flexible spaces increased the intensity of learning activities by up to 35%. This comparison is interesting because it demonstrates that, despite operating overseas and facing physical limitations, SIM is able to achieve similar effectiveness through space optimization.

Coordinated space scheduling also reflects the practice of space allocation management, as explained by Briggs & Webb, who argue that systematic distribution of time and space can reduce usage conflicts by up to 50%. In the context of MIS, a standardized scheduling system demonstrates the concrete implementation of this principle.

2. Periodic Maintenance

Facility maintenance at SIM is carried out preventively and on a scheduled basis. This maintenance model aligns with the preventive maintenance concept according to Gorton and Alston, who emphasize that routine maintenance is a crucial strategy for maintaining the sustainability of infrastructure and preventing significant repair costs.

Sulaiman's research shows that schools implementing preventive maintenance can reduce facility damage by up to 40%. A similar strategy is seen at SIM, which consistently maintains the quality of facilities such as air conditioning, electricity, and laboratory equipment through routine checks. This adaptation is crucial given Saudi Arabia's extreme climate (hot temperatures) that accelerates the deterioration of electronic devices and reduces the comfort of spaces.

In addition, the existence of a structured maintenance list that is posted and monitored periodically shows the application of the maintenance documentation principle recommended by Schneider, namely that maintenance documentation is able to increase the accountability and continuity of school infrastructure services.

¹⁷ Agus Susanto, "Inovasi Penataan Ruang Kelas Untuk Meningkatkan Keterlibatan Siswa Dalam Proses Pembelajaran," *AT-TAKLIM: Jurnal Pendidikan Multidisiplin* 2, no. 6 (2025): 39–53.

3. System Damage Reporting

The multi-channel damage reporting system in the SIM, using report books, digital forms, and rapid communication media, demonstrates the integration of technology into infrastructure management. This approach aligns with Kurniawan's findings, which suggest that digitizing infrastructure reporting can accelerate technical response by up to 60% compared to manual reporting.

Using Google Forms to document reports reflects the concept of digital facility management, a practice now widely adopted in modern educational institutions. A quick response to damage reports demonstrates a collaborative and responsive organizational culture, which, according to Hoy & Miskel, is one indicator of effective school management. While manual reporting systems slow down the repair process in many Indonesian schools, SIM is in a more progressive position because it combines a digital system with rapid, internal group-based communication.¹⁸

4. External Collaboration

Collaboration is a key strategy in optimizing infrastructure in overseas schools. SIM developed partnerships with the Indonesian Consulate General in Jeddah, the Indonesian community in Mecca, and local service providers. This strategy confirms Epstein's theory on school-community partnerships, which emphasizes that collaboration can increase resource capacity and enhance the sustainability of facility development.

In the context of the SIM, the involvement of the Indonesian Consulate General in Jeddah in major procurement and renovations reflects a pattern of institutional-level collaboration similar to the findings of Widodo & Hartati in Indonesian schools in Kuala Lumpur. They found that government support through diplomatic institutions significantly impacted the infrastructure development of foreign schools that did not fully access local funding.

The participation of the Indonesian community and parents in Mecca aligns with the theory of community empowerment, which states that social participation can increase a sense of ownership and strengthen the sustainability of educational facilities. This collaboration demonstrates that a strategy of strengthening external networks can overcome the limitations of formal funding structures.

5. Innovation Development of Facilities and Infrastructure

SIM's innovations include library digitization, utilization of online learning platforms, flexible classroom design, and the creation of simple teaching aids from local

¹⁸ Dini Sakti Natavia, "Integrasi Sistem Informasi Manajemen Dalam Mendukung Mutu Pendidikan," *JIIP-Jurnal Ilmiah Ilmu Pendidikan* 8, no. 7 (2025): 7063–73.

materials. These innovations align with the concept of adaptive innovation in education, which emphasizes the ability of schools to create solutions tailored to local situations.

The digitization of library catalogs supports Yuliani's findings, which state that digital catalog systems increase book access efficiency by up to 50%. This is especially relevant in situations where physical storage space is limited, such as in SIMs.

Flexible classroom design that is easy to change according to learning needs strengthens the flexible learning environment theory from Byers, Imms & Hartnell-Young, that dynamic spatial layout increases student participation and the effectiveness of collaborative learning.

Making simple teaching aids from local materials is also in line with Widodo's research which proves that teaching aids made from inexpensive materials do not reduce the quality of learning as long as the design is relevant and functional.

This limitation-based innovation is an interesting finding because it shows that Saudi Arabia's geographical and regulatory challenges actually trigger the creativity of teachers and school management, a phenomenon also found by Tan in international schools with limited access to modern facilities.

Based on the discussion, it can be concluded that the principal's strategy in optimizing facilities and infrastructure at the Makkah Indonesian School (SIM) is effective because it integrates flexible space utilization, scheduled preventive maintenance, a responsive digital-based damage reporting system, strong external collaboration, and infrastructure innovations tailored to the educational context abroad. All of these strategies demonstrate adaptive and contextual leadership, in accordance with modern educational management theory that emphasizes efficient resource utilization, operational sustainability, and needs-based innovation. These findings confirm that despite facing physical and regulatory limitations, the principal is able to ensure that SIM facilities and infrastructure continue to support the learning process optimally through a strategic, collaborative, and innovative approach.

CONCLUSION

Based on the results of research on the principal's management strategy in optimizing educational facilities and infrastructure at the Makkah Indonesian School (SIM), several important things can be concluded as follows:

1. Condition of Educational Facilities and Infrastructure at Indonesian Schools in Makkah

Educational facilities and infrastructure at the Indonesian School of Makkah are considered adequate, although not yet fully optimal. Key facilities such as classrooms,

laboratories, libraries, and prayer rooms are in good condition, but the limited physical space due to the school's location within the Indonesian representative office complex remains a challenge. Several facilities, such as the science laboratory, sports facilities, and library collections, require improvement and renewal, while ICT facilities support learning, although there are some areas requiring improved internet access. Overall, the SIM infrastructure is sufficient to support the learning process, but requires a special management strategy to address the physical limitations of the Indonesian School Abroad (SILN).

2. Principal's Strategy in Planning Facilities and Infrastructure

The principal implemented a structured, participatory, and adaptive infrastructure planning strategy through inventory-based needs analysis, teacher and student input, and learning evaluation results. Planning was conducted by establishing priorities based on urgency and funding capacity, involving the entire school community to ensure more accurate infrastructure needs, and aligning the procurement process with Saudi Arabian government regulations. The principal also developed Standard Operating Procedures (SOPs) and Work Plans (RKAS) as guidelines for infrastructure development and maintenance. Overall, this planning strategy reflects sound managerial implementation in accordance with the principles of educational planning and infrastructure management.

3. Principal's Strategy in Optimizing Facilities and Infrastructure

The principal's strategy for optimizing facilities and infrastructure is implemented through effective utilization of facilities, such as rotating room use, multi-purpose room utilization, and ICT integration, as well as routine maintenance that includes checking air conditioning, electrical installations, and laboratory equipment maintenance. Optimization is also strengthened by a rapid damage reporting system through report books, digital communication, and online forms, plus external collaboration with the Indonesian Consulate General, local service providers, and the Indonesian citizen community to support the procurement or repair of facilities. Furthermore, the principal encourages various innovations such as library digitization, the creation of simple teaching aids, and the development of flexible classrooms. Overall, this strategy is able to maintain the functionality of infrastructure and improve the quality of learning despite the school facing limitations in space and resources as a SILN.

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