Didaktika: Jurnal Kependidikan, Vol. 12, No. 4, November 2023

5S Culture of Excellence in Facilities and Infrastructure Management in Higher Education Institutions

Cahya Kirani[1], Rohmatun Lukluk Isnaini[2], Agil Amirus Sholichin3, Ahmad Naufal Gumilang[4], Fitrianingsih[5]

[1, 2, 3,4,5] Universitas Islam Negeri Sunan Kalijaga, Indonesia

2220409123@student.uin-suka.ac.id

Abstract

The 5S management method (seiri, seiton, seiso, sheiketsu, shitsuke) that manufacturing companies originally applied was adapted and applied in educational institutions. The process of internalization from the industrial sector towards education, such as higher education institutions, certainly requires modifications and encounters different challenges and solutions. Therefore, this study aims to discover the concept of a superior culture of 5S in managing facilities and infrastructure in higher education institutions. This study uses a systematic literature review method through the identification, evaluation, and interpretation stages of Kitchenham. Several publishers, such as Science Direct, Emerald Insight, Research Gate, Google Scholar, and Garuda, have reviewed the articles published in the last ten years. In addition, several articles and other literature were also included as reference material to strengthen the research results. The results show that 1) the 5S concept can be applied in higher education institutions with certain adjustments based on needs and abilities; 2) challenges in 5S Implementation include the role of leadership and shared commitment. The strategy to achieve it requires the Plan, Do, and Check stages. So, it can be concluded that 5S can be applied as a work culture in managing facilities and infrastructure in higher education institutions.

Keywords: 5S, Facilities and *Infrastructure, Higher Education Institutions*

Introduction

Research on influential culture for managing facilities and infrastructure in higher education institutions still needs to be completed. However, facilities and infrastructure management is essential in education management (Megasari, 2014). Facilities and infrastructure significantly contribute to achieving education's vision, mission, and goals (Jumari, 2019) because they can support creating effective, efficient, meaningful, quality, and enjoyable teaching and learning activities (Aisah et al., 2021). This learning experience and learning process contribute to student character education (Hyangsewu et al., 2021). However, the facts show that managing facilities and infrastructure could be better. This is due to a need for more ability to manage educational facilities and infrastructure by existing theory and practice (Kurniawati & Sayuti, 2013), constraints on fund allocation, and inadequate maintenance (Rismayani et al., 2021). This non-ideality in management ultimately impacts the effectiveness of learning (Damopoli, 2015). Moreover, the need for quality and effective education continues to increase, so innovation is needed in its management (Nurfaizah et al., 2022), which needs to be done professionally with precise mechanisms and steps (Ahmad, 2021).

One of the innovation efforts to improve the quality of management of facilities and infrastructure is the 5S concept, which consists of 5 words, namely *Seiri* (concise), *Seiton* (neat), *Seiso* (clean), *Seiketsu* (careful), and *Shitsuke* (diligent) (Kamil et al., 2022) with the flow that can see in Figure 1. This technique, created by Takashi Osada in 1980 (Gupta, 2022), is the first step in implementing the principle that the workplace is well organized and neat to increase productivity (Patel & Kiran, 2021). Continuity in implementing 5S can improve safety and order in the work environment (Randhawa & Ahuja, 2017). It can even form a culture of discipline among workers, achieving effectiveness of up to 30% (Surya & Sundaram, 2021). It is in line with Manank's research results, which note that 5S is an effective tool in improving organizational performance, regardless of company type (small or large), sector (service or manufacturing), and ownership (private or government), with a tailored strategy (Patel & Kiran, 2021). It is this flexibility and effectiveness that allows higher education institutions to adopt this concept in the management of facilities and infrastructure.

Figure 1. 5S/5R concept

Previous studies have been on applying the 5S concept in higher education institutions. Ravi said that implementing 5S is the right step because it can increase discipline and rearrange the layout of educational facilities and infrastructure to increase employee performance efficiency (Chourasia & Nema, 2019). Ashokkumar also explained how employees can implement 5S in higher education institutions (Ashokkumar, 2021). From these two studies, this research focuses on stages and results. Even though each component of 5S is explained clearly, almost no aspects are part of the process in the form of challenges faced, and strategies carried out to achieve performance efficiency that indicates successful implementation of this concept. These two things are necessary to determine whether higher education institutions can cultivate 5S to manage their facilities and infrastructure.

The research seeks to fill the gaps in previous studies by positioning the 5S concept as a superior culture in the general management of facilities and infrastructure in higher education institutions. This research explains two things: 1) understanding of the implementation of 5S in managing facilities and infrastructure in higher education institutions and 2) challenges and strategies in its implementation to ensure the success of the 5S cultivation process in higher education institutions. The argument proven in this research is that the 5S concept can become a culture of excellence in the context of managing facilities and infrastructure in higher education institutions. Although this concept is generally applied in manufacturing companies, many

research results show successful implementation in various fields, including education. Understanding the five stages increases the percentage of success and perceived usefulness packaged in good cooperation between components in higher education institutions.

Method

The object of this research study is a higher education institution. The reason for choosing a higher education level is that there still needs to be more literature linking the 5S concept to higher education institutions, which is reviewed not only from methods and results but also from the challenges and strategies so that maximum benefits can be obtained. This article was prepared based on a systematic review of some literature from scientific articles and journals. Article data was obtained by reviewing several sites published in the last ten years, such as *ScienceDirect, Research Gate, Emerald Insight, Google Scholar*, and Garuda. However, several previous articles and other literature are also referenced to confirm the research results, considering that the 5S concept has existed since the 1980s.

Systematic review research goes through three stages, namely 1) identification (planning the review), 2) evaluation (conducting the review), and 3) interpretation (reporting the review) (Kitchenham, 2004). The following is the chart in this research:

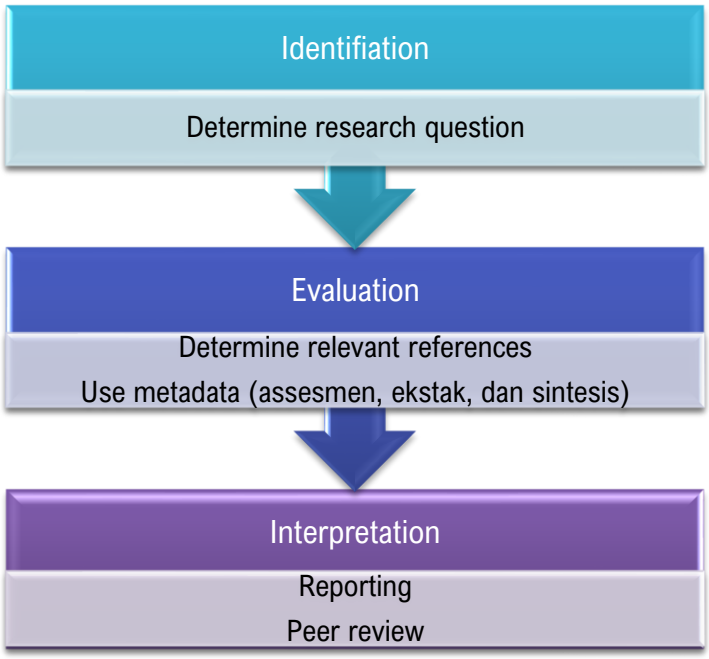

Figure 2. Development of research stages, according to Kitchenham (Kitchenham, 2004)

At the identification stage, the research question is presented as follows:

RQ1: How is 5S implemented in higher education institutions?
RQ2: What challenges and strategies can be implemented to manage higher education facilities and infrastructure?

At the evaluation stage (*conducting the review*), to obtain appropriate literature, identification, and selection are carried out based on predetermined inclusion criteria, namely 1) journal articles that discuss the understanding of 5S, challenges and strategies, as well as the role of leadership and commitment in the formation of culture Work; 2) empirical and theoretical

research; 3) downloadable journal articles or scientific research; 4) journal articles or scientific research in Indonesian and English. The next step is using the meta-synthesis method to carry out the data analysis process. Two types of *systematic literature review* methods exist meta-analysis and meta-synthesis (Nugroho et al., 2021). This research uses meta-synthesis data analysis techniques to integrate data to obtain a deeper and more comprehensive understanding and produce new theories or concepts. Meta-synthesis is used to answer research questions by summarizing various research results. As the final stage, interpretation (*reporting the review*) is carried out by systematically writing reports and *proofreading* by lecturers and colleagues to find comprehensive and easy-to-understand results.

Results and Discussion

This section presents research results to answer *research questions*: 1) Implementation of 5S in managing facilities and infrastructure in higher education institutions; 2) challenges and strategies in implementation. Here is the explanation:

Implementation of 5S in the Management of Facilities and Infrastructure in Higher Education Institutions

5S can be considered a *lean tool* because it reduces waste and adds value to the process. It is a cheap technique that higher education institutions can use to clean, order, organize, and standardize facilities and infrastructure management. In the early 1980s, Takashi Osada developed the 5S concept consisting of 5 things (*seiri, seiton, seiso, sheiketsu, and shitsuke*). This technique can be combined with other techniques such as *Kanban, Kaizen, Total Preventive Maintenance,* and *Total Quality Management* to overcome related problems in the workplace (Pita, 2020).

In higher education institutions, at the *Seiri stage*, items can be sorted by removing all unused or redundant items (Tahasin et al., 2021). This stage will be tricky because the existing items are still considered essential, but must evaluate what is necessary and what is not (Ortiz, 2015). *Sheiton* points out that everything should be kept in its proper place for time efficiency in searching. Especially in this digital era, all data in higher education institutions can be stored in software by assigning separate folders for essential documents and placing them in specific folders to ensure easy access (Balakrishnan, 2012). Meanwhile, *Seiso* keeps everything clean and tidy. *Sheiketsu* maintains and makes 5S part of the culture of managing facilities and infrastructure. Following the Shitsuke stage, habits are formed through discipline (Omogbai & Salonitis, 2017; Gupta, 2022). To more understand, it can be seen in Table 1 below:

Table 1. Developing the concept and implementation of 5S in facilities and infrastructure

Stage	Implementation	Steps	Benefit
Seiri	The activity of getting rid of items that are not needed so that all items on the work site are only items extremely needed for work activities	- Take photos of the current state of the location. - Prepare a layout plan after carefully checking the drawings and the proposed layout after implementation. - Formulate or propose a location. - Label the location for easy identification.	To create order by maximizing efficiency and effectiveness by reducing people's workload and human error through process simplification
Seiton	All facilities and infrastructure must be placed in the specified position for use.	- Set similar items in sequence, and the location is formulated and labeled in *Seiri*. - unwanted items	
Seiso	Activities to clean equipment and work	- Clean the shelves and items stored in all rooms, especially those with frequent	To create cleanliness to maximize effectiveness by

	areas so that all facilities are maintained in good condition	mobility (lecturer's office, classroom, bathroom, and others).	contributing to healthier lives, safety, and well-being, as well as increasing transparency
Seiketsu	Activity maintains personal and institutional cleanliness while complying with the three previous stages.	- Standardize workspaces and save all necessary items to other allocated spaces. - Use colorful ribbons, labels, and others to represent the item level. - Prepare display boards showing rules, roles, and responsibilities.	
Shitsuke	Maintaining the personal discipline of each individual and the institutional environment in carrying out all stages of 5S	- Train stakeholders, employees, and students who directly use the space and contribute to its management. - Formulate follow-up plans, provide feedback, and review previous 5S implementation. - Reward employees and individuals who contribute efficiently	to improve morale (discipline and order), improving facilities and infrastructure management quality.

Source: Srivastava et al. (2019) ; Kolambe & Sambhaji (2020)

Kaizen mindset or making continuous improvements so that they can be used according to their function (Hasriadi, 2021); 2) developing teamwork through the participation of the entire workforce; 3) developing managers and supervisors who have practical leadership; and 4) improving infrastructure for the adoption of more sophisticated technology (Hafidz & Soediantono, 2022). According to the study of Aziz et al. (2014), the implementation of 5S has been successful in various fields because the concept is simple and provides immediately visible results. However, the goal can be achieved if the implementation of 5S is carried out seriously by employees and students in higher education institutions.

It is important to remember that the 5S methodology should not be considered a separate project but rather a value that must be fought for to become a superior work culture. Success begins when all organization members understand that 5S is a new way of working, so every component of 5S must be maintained and addressed. No single component in 5S should be ignored, as in the case of just implementing 3 or 4S (Jiménez et al., 2015). This understanding must be a primary concern in implementing 5S in higher education institutions.

Challenges and Strategies in Implementing 5S in Facilities and Infrastructure Management in Higher Education Institutions

The 5S methodology is related to creating systematic and standardized processes in organizations or individual work to become routine or commonly carried out (Pepper & Spedding, 2010). If it is implemented well personally and organizationally, it will track every progress achieved (Witt et al., 2018). However, among the 5S, *shitsuke* (diligence) is the most challenging stage (Kolambe et al., 2020; Gupta, 2022). This stage requires commitment from all implementers and involves values to which have been previously adhered. If these values are appropriate and implemented by most employees or students, it will be easier but challenging if the facts show otherwise.

In their research linking 5S with the attributes of the ISO 9001 standard, Nurcahyo et al. (2019) concluded that implementing 5S in higher education institutions requires an active role from management to ensure the achievement of educational quality under established criteria. Facilities and infrastructure managers and central-level managers can carry out this role. The

importance of management's role is related to implementing 5S as a new work culture that requires influential leaders to encourage and shape this new culture.

In carrying out their functions, leaders can influence, encourage, and direct the behavior of subordinates so that they comply with established rules. Through strong leadership, leaders can help increase effectiveness in realizing a culture of excellence (Astuti & Danial, 2019) in managing facilities and infrastructure. This finding is supported by Kuek's research results quoted by Rafiqa (2017), that the lack of top management support and involvement makes it increasingly challenging to implement 5S. Thus, active involvement and support from management –especially top management– is crucial in ensuring the successful implementation of 5S in higher education institutions.

Research by Daraei et al. (2015) found three critical factors or *Critical Success Factors (CFS*) that top management needs to know and understand, namely 1) situational analysis; 2) the leader's persistence, knowledge, acceptance and authority; and 3) confidence, commitment and support from top management. For more details, see Table 2 below:

Table 2. Development of *Critical Success Factors (CSFs)*

No	Factor	Impact
1	Situational analysis	Material for consideration in decision-making
2	Perseverance, knowledge, acceptance, and authority of the leader	Achieve full benefits from 5S implementation
3	Confidence, commitment, and support of top management	Increasing the effectiveness of implementing 5S as a new work culture

Source: Daraei et al. (2015)

First is situational analysis. This factor is given top priority in the context of higher education institutions. It is important because higher education institutions must realize that applying the 5S concept is not a single solution to all performance problems but rather a tool to identify the organization's ability to implement 5S and consider achieving long-term prosperity. Therefore, higher education institutions need to carry out a SWOT analysis to identify strengths and opportunities as dominant factors that support the implementation of 5S, as well as analyze weaknesses and threats as inhibiting factors both in the context of the 5S concept and higher education institutions as a whole (Hadi, 2013). By conducting a SWOT analysis, higher education institutions can obtain a more comprehensive picture, which can be used as a reference in making better decisions.

Second, "Perseverance, knowledge, acceptance, and authority of the leader," where the leader must be trained and qualified because it is the main factor in determining success in creating a quality educational institution (Krisbiyanto, b). Leader competency is essential to achieve the full benefits of efficiency, cost reduction, elimination of waste, and others. In their role, leaders encourage the development of a sense of dedication and commitment of employees and students towards implementing the 5S program through the socialization and practice of 5S (Fotopoulos & Psomas, 2010).

Third is confidence, commitment, and support for top management. This factor is crucial in dealing with cultural issues or differences related to 5S Implementation. Top management is the leading player in ensuring that 5S activities run according to plan. Without severe management involvement and joint commitment or "*team working spirit*" from all components, the success

of this program will be in doubt. It is related to what Mendes (2012) explained, that to implement the 5S program, recognition and commitment are needed from all levels in the organization. In other words, to make 5S effective, employees must learn and understand clearly and try hard to practice 5S (Badzran, 2017). However, this will be fully understood once employees understand the concept (Sánchez et al., 2015).

In different literature, Naharuddin (2013) argues that to implement 5S in daily activities fully; employees must have the will and openness to do so. The more enormous impact is that it can increase productivity, performance effectiveness, and joint commitment. This commitment is essential in management and organizational behavior (Daraei et al., 2015). So that this does not happen, agency management needs to formally inform through guidelines about how to sort goods and conduct the necessary training on how to take action to make operations more straightforward to carry out to achieve success. Managers are also recommended to make employees more involved in establishing quality standards because they are more in touch with operations in the field (Ezzeddine & Aoun, 2020).

Organizations without a complete understanding of the obstacles to implementing a culture-changing system like 5S are doomed to failure (Daraei et al., 2015). Top management can delegate employees individually or in teams to prevent this and learn the 5S method in managing facilities and infrastructure in other institutions that have successfully implemented this concept (Widiandari et al., 2018). Apart from providing room for employee development to increase motivation (Rusdy, 2020), this method can also impact performance effectiveness by minimizing *trial* and *error,* which can be avoided. Thus, training programs for 5S practices become essential to increase employee awareness and achieve effective 5S implementation. This contribution then fosters a sense of responsibility and commitment to implementing 5S. Methods such as providing appreciation in the form of *rewards* or prizes for employees and students who excel in implementing 5S can be used as another trigger so that each stage of 5S continues (Pangestu & Negara, 2019).

From the description above, a strategy can be described that can be carried out by higher education institutions to make 5S a culture of superior management of facilities and infrastructure:

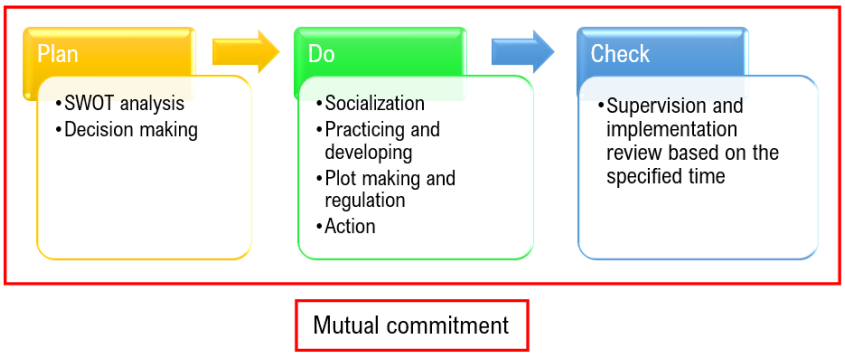

Figure 3. Strategy for implementing 5S in the management of facilities and infrastructure in higher education institutions

The SWOT analysis results will provide a big picture of the institution's ability to implement it in the future. Followed by a *"Do" process,* which includes socialization, training, and development, as well as creating pathways and regulations, it will make it easier for institutions to disseminate the 5S concept to employees and students. In the next stage, a *"Check"* process

is carried out, which includes monitoring and evaluation to determine the achievement of objectives and find policy recommendations to ensure the continuity of this program. Through *the Plan, Do,* and *Check* stages, it will accelerate the implementation of 5S in managing facilities and infrastructure in higher education institutions if framed with a solid joint commitment.

Conclusion

The 5S concept can be applied in higher education institutions with certain adjustments based on the needs and capabilities of each institution. The challenge in implementing 5S lies in leadership quality and commitment to building a superior culture in managing facilities and infrastructure. Meanwhile, the strategy to achieve this requires *the Plan, Do,* and *Check stages*. This article is limited to the context of higher education institutions by analyzing previous articles. So, recommendations for future researchers include 1) studying the culture of 5S in higher education institutions with empirical research and 2) comparing with other similar research to find significant novelties. The author hopes that, despite all the limitations, this research can still contribute to the development of science, especially in developing the 5S concept and managing facilities and infrastructure in educational institutions.

Reference

Ahmad, M. (2021). Management of Facilities and Infrastructure in Schools. *Academics : Journal of Educational Technology*, *10* (01), 93–112. https://doi.org/https://doi.org/10.34005/akademika.v10i01.1348

Aisah, I., Sanusi, A., Khoeriah, ND, & Sudrajat, A. (2021). Management of Infrastructure in Improving the Quality of Vocational High School Graduates. *Journal of Industrial Engineering & Management Research*, *2* (4), 172–189. https://doi.org/https://doi.org/10.7777/jiemar.v2i4

Ashokkumar, J. (2021). Implementation of the 5S Model from Corporate to Educational Institutions. *International Journal of Science and Research (IJSR)*, *10* (10), 1247–1250. https://doi.org/10.21275/SR211024194423

Astuti, & Danial. (2019). Leadership of Madrasah Heads in Building a Conducive Madrasah Culture in State Madrasah Aliyah. *El-Idare: Journal of Islamic Education Management*, *5* (1), 31–45. https://doi.org/10.19109/ELIDARE.V5I1.3495

Aziz, AA, Nishazini, M., Za, F., & Azizan, N.A. (2014). Survey To See The Impact Of 5s Implementation Among Staff Of Kpj Seremban Specialist Hospital, Malaysia. *IOSR Journal of Business and Management*, *16* (3), 82–96. https://doi.org/10.9790/487x-16318296

Badzran, RNBBM (2017). The Effectiveness of 5S Practices. *SSRN Electronic Journal*, 1–16. https://doi.org/10.2139/SSRN.2986881

Chourasia, R., & Nema, A. (2019). Implementation of 5S Methodology in Higher Education Institute. *International Research Journal of Engineering and Technology*, *6* (2), 1795. www.irjet.net

Damopoli, M. (2015). Problems of Islamic Education and Efforts to Solve Them. *Tadbir: Journal of Islamic Education Management National Islamic Education Management*, *3* (1), 68–81. http://journal.iaingorontalo.ac.id/index.php/tjmpi%0APROBLEMATIKA

Daraei, R.M., Mirza Hasan, H., Iman, N., & Alireza, K. (2015). Identifying and Ranking the Critical Success Factors Affecting Implementation of 5S. *American Journal of Service Science and*

Management, *2* (6), 67–73. http://www.openscienceonline.com/journal/ajssm

Ezzeddine, R., & Aoun, M. (2020). The Effect of 5S on Employee Performance: An Empirical Study among Lebanese Hospitals. *International Business and Accounting Research Journal*, *4* (1), 44. https://doi.org/10.15294/ibarj.v4i1.119

Fotopoulos, C.V., & Psomas, E.L. (2010). The structural relationship between TQM factors and organizational performance. *TQM Journal*, *22* (5), 539–552. https://doi.org/10.1108/17542731011072874

Gupta, K. (2022). A Review on Implementation of 5S for Workplace Management. *Journal of Applied Research on Industrial Engineering Www.Journal-Aprie.Com*, *9* (3), 323–330. https://doi.org/http://dx.doi.org/10.22105/jarie.2021.292741.1347

Hadi, A. (2013). SWOT Analysis Concept in Improving the Quality of Madrasah Institutions. *Journal of Scientific Didactics*, *14* (1), 143–158. https://doi.org/10.22373/jid.v14i1.494

Hafidz, A., & Soediantono, D. (2022). Benefits of Implementing 5S and Proposed Applications in the Defense Industry : A Literature Review. *International Journal of Social and Management Studies (Ijosmas)*, *3* (3), 13–26. https://doi.org/https://doi.org/10.5555/ijosmas.v3i3.139

Hasriadi. (2021). Media Preservation as a Learning Resource in Formal Education Institutions. *Didactics: Journal of Education*, *10* (4), 266–280. https://doi.org/10.58230/27454312.120

Hyangsewu, P., Islamy, MRF, Parhan, M., & Nugraha, RH (2021). The Effect of Using Gadgets on Student Social Behavior in the Globalization Dimension. *Journal of Educational Science Research*, *14* (2), 127–136. https://doi.org/10.21831/jpipfip.v14i2.39156

Jiménez, M., Romero, L., Domínguez, M., & Espinosa, M. del M. (2015). 5S methodology implementation in the laboratory of an industrial engineering university school. *Safety Science*, *78* (October), 163–172. https://doi.org/10.1016/j.ssci.2015.04.022

Jumari. (2019). The urgency of managing quality facilities and infrastructure in increasing student creativity. *Widya Balina Journal* , *4* (7), 86–92. https://journal.staidenpasar.ac.id/index.php/wb/article/view/33/30

Kamil, I., Amir, A., & Ambari, D. (2022). The concept of Muslim work ethic, 5S, and its relevance to the 3T character of Toyota Indonesia Community Academy students. *Journal on Education*, *05* (01), 1122–1132.

Kitchenham, B. (2004). *Procedures for Performing Systematic Reviews*. Keel University. https://doi.org/10.1145/3328905.3332505

Kolambe, C.K., & Sambhaji, S. (2020). Implementation of 5S in College (Shree et al.'s Institute of Technology Polytechnic). *International Research Journal of Engineering and Technology (IRJET)*, *7* (11), 423–427. https://www.irjet.net/archives/V7/i11/IRJET-V7I1170.pdf

Krisbiyanto, A. (2019). Effectiveness of Madrasah Head Leadership on the Quality of Education at MTsN 2 Mojokerto. *Nidhomul Haq : Journal of Islamic Education Management*, *4* (1), 52–69. https://doi.org/10.31538/ndh.v4i1.182

Kurniawati, PI, & Sayuti, SA (2013). Management of Facilities and Infrastructure at SMK N 1 Kasihan Bantuk. *Journal of Educational Management Accountability*, *1* (1), 98–108. https://doi.org/10.21831/AMP.V1I1.2331

Luis Mendes. (2012). Employees' Involvement and Quality Improvement in Manufacturing Small and Medium Enterprises (SME): A Comparative Analysis. *African Journal of Business Management*, *6* (23), 6980–6996. https://doi.org/https://doi.org/10.5897/AJBM12.234

Megasari, R. (2014). *Improving the Management of Educational Facilities and Infrastructure to Improve the Quality of Learning at SMPN Bukittinggi* . *2* (1), 636–648. https://doi.org/https://doi.org/10.24036/bmp.v2i1.3808

Naharuddin, N.M., & Sadegi, M. (2013). Factors of Workplace Environment that Affect

Employees Performance: A Case Study of Miyazu Malaysia. *International Journal of Independent*, *2* (2), 66–78. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2290214

Nugroho, DA, Khasanah, DN, Pangestuti, IAI, & Kholili, MI (2021). Problems of implementing guidance and counseling in high schools: A systematic literature review (SLR). *THERAPUTS: Journal of Guidance and Counseling*, *5* (1), 87–96. https://doi.org/10.26539/teraputik.51647

Nurcahyo, R., Apriliani, F., Muslim, E., & Wibowo, AD (2019). The Analysis of the Implementation of 5S Principles Integrated With ISO 9001 Requirements at Higher Education Level. *SAGE Open*, *9* (3). https://doi.org/10.1177/2158244019870773

Nurfaizah, Putro, KZ, & Tejaningrum, D. (2022). Students' Critical Thinking Skills in the Learning Strategy Course. *Journal of Educational Science Research*, *15* (1), 46. https://doi.org/http://dx.doi.org/10.21831/jpipfip.v15i1.41689

Pangestu, AA, & Negara, AAP (2019). Implementation of the 5S Method at PT. XYZ Majalengka Textiles. *Industrial Research Workshop and National Seminar*, *10* (1), 490–494. https://doi.org/https://doi.org/10.35313/irwns.v10i1.1434

Patel, M. M., & Kiran, M. B. (2021). The Review on Various Strategies Adopted for Implementing and Sustaining 5S in a Manufacturing Industry. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, 5099–5108. https://doi.org/https://doi.org/10.46254/an12.20221030

Pepper, M. P. J., & Spedding, T. A. (2010). The evolution of lean Six Sigma. *International Journal of Quality and Reliability Management*, *27* (2), 138–155. https://doi.org/10.1108/02656711011014276

Randhawa, J.S., & Ahuja, I.S. (2017). 5S implementation methodology: Literature review and directions. *International Journal of Productivity and Quality Management*, *20* (1), 48–74. https://doi.org/10.1504/IJPQM.2017.080692

Rismayani, Ayu Lestari, E., & Nindra Utami Br Tarigan, N. (2021). Problems with Educational Facilities and Infrastructure. *Al-Ulum: Journal of Islamic Education*, *2* (2), 136–149. https://doi.org/10.56114/AL-ULUM.V2I2.119

Rushdy. (2020). The Influence of Leadership Style, Motivation, and Position Promotion on Employee Performance. *Didactics: Journal of Education*, *9* (2), 273–290. https://doi.org/10.58230/27454312.38

Sánchez, P. M., Rodriguez, C. M., Maruyama, U., & Salazar, F. (2015). Impact of 5S on quality, productivity and organizational climate - Two Analysis Cases. *Proceedings of the 2015 International Conference on Operations Excellence and Service Engineering*, 748–755. https://doi.org/http://dx.doi.org/10.1007/978-3-319-14078-0_28

Srivastava, K.R., Gupta, R.K., & Khare, M. (2019). 5S Methodology Implementation in the Laboratories of Universities. *International Journal of Engineering and Advanced Technology*, *8* (6), 5079–5083. https://doi.org/10.35940/ijeat.F9555.088619

Surya, & Sundaram, V. (2021). A study on the implementation of 5S in Warehouse of Win Agency, Theni. *IJARIIE: International Journal of Advanced Research and Innovative Ideas in Education*, *7* (5), 124–132. https://doi.org/10.1088/1757-899x/1122/1/012063

Widiandari, A., Saraswati, D., Fadli, ZA, Ratna, MP, & Hastuti, N. (2018). 5S Analysis at the Musytamirul Furqon Rowosari Orphanage in Tembalang Semarang. *Harmony*, *2* (2), 20–25. https://doi.org/https://doi.org/10.14710/hm.2.2.%25p

Witt, C. M., Sandoe, K., & Dunlap, J. C. (2018). 5S Your Life: Using an Experiential Approach to Teaching Lean Philosophy. *Decision Sciences Journal of Innovative Education*, *16* (4), 264–280. https://doi.org/10.1111/dsji.12167