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ANALYSIS OF THE MANAGEMENT OF THE BIOLOGY AND PHYSICS LABORATORY AT SMP NEGERI 1 KUDUS

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Abstract
Effective science laboratory management is key to the success of practicum-based science learning in junior high schools. This research aims to describe science laboratory management at SMP Negeri 1 Kudus, identify problems, and formulate effective management solutions. Using a qualitative approach, data were collected through observation, in-depth interviews, and documentation. The research results show that laboratory management has been running quite well, especially regarding physical aspects, practicum implementation, and teacher involvement. However, several significant obstacles exist, such as the absence of dedicated laboratory personnel, limited personal protective equipment (PPE), and the lack of documented SOPs and adequate evaluation systems. This research recommends strengthening the laboratory organizational structure, improving safety facilities, and developing documented administrative and evaluation systems to support the effectiveness of laboratory-based learning.

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INTRODUCTION

The Natural Sciences Laboratory is one of the vital facilities in the science learning process at the secondary school level, especially junior high school. The existence of the laboratory is not only a means of support, but also a main medium for students to develop science process skills through practicum activities based on observation, experimentation, and direct problem solving. However, laboratory management in junior high schools is still faced with various challenges. According to (Chen & Yang, 2016) Many high schools do not have specialized technical staff in the management of laboratory administration. In addition, other obstacles include the lack of Standard Operating Procedure

(SOP) documents, the limitation of personal protective equipment (PPE), and the weak evaluation and documentation system that should be an integral part of effective and safe laboratory management.

This condition is also reflected in SMP Negeri 1 Kudus, where the entire burden of laboratory management is still borne by science teachers, without the support of an adequate organizational structure and support system. This problem impacts the lack of maximum practicum activities and increases occupational safety risk in the laboratory environment. Various previous studies have discussed the importance of good laboratory management. A study by (Zohoun et al., 2021) shows that the laboratory work program implementation still needs to be improved in terms of workforce planning and training. (Opperman et al., 2022) Find weaknesses in waste management procedures that have not been documented. Meanwhile, (Yator & Kipchumba, 2023) emphasised that the existence of SOPs and administrative recording systems significantly affects the effectiveness of laboratory use.

Relevant previous research conducted by (Sabella et al., 2020) at State High Schools in the Jakarta area with a quantitative approach that focuses on measuring the feasibility of laboratory facilities based on national standards. The study results show that 65% of high school laboratories in Jakarta have a sufficient level of feasibility, but still need to improve the aspect of occupational safety. Furthermore, an experimental study by (Setiya Rini et al., 2024) in junior high schools in the Surabaya area analysed the influence of laboratory management on student learning outcomes using a pre-test and post-test design. The study concluded that there was a positive correlation between the quality of laboratory management and students' science learning achievement, but did not explore managerial aspects in depth.

This gap is an important gap to be further researched, considering that the qualitative approach can describe actual conditions more in-depth and contextually, both in terms of policy, operational technicalities, and perceptions of education actors. Therefore, this research comes with a qualitative descriptive approach that thoroughly explores the management of science laboratories at SMP Negeri 1 Kudus, including physical, administrative, security, waste management, and the role of teachers and students in laboratory activities.

The novelty of this research lies in the focus and approach used and in the compilation of recommendations based on empirical findings in the field. Specifically, this study differs from previous research in terms of: (1) a qualitative approach that provides an in-depth and contextual overview of the dynamics of laboratory management, in contrast to quantitative research that only measures the level of feasibility; (2) comprehensive focus that includes six main aspects, namely physical conditions and infrastructure, administrative and planning, laboratory organization, implementation of practicum activities, occupational safety and security, and integrated management of chemicals and waste; (3) the geographical context in the Kudus area that has not been widely studied in laboratory management research; and (4) a holistic approach that not only identifies problems but also provides applicative solutions based on real

conditions in the field, in contrast to experimental research that is limited to impact measurement. Thus, this research is expected to make a practical contribution to improving the quality of laboratory management in schools. With this background, this research aims to describe the actual condition of the laboratory, identify laboratory administration and planning, know the organization of the laboratory, identify the implementation of laboratory activities, identify the safety and security of the laboratory, understand the management of chemical materials and laboratory waste, know the evaluation and supervision of the laboratory, and identify obstacles and provide recommendations for solutions management of science laboratories at SMP Negeri 1 Kudus.

METHOD

This research uses a qualitative approach to understand the conditions and management of science laboratories at SMP Negeri 1 Kudus. This approach was chosen because it can portray social realities contextually and holistically, especially in assessing managerial processes that cannot be measured by numbers alone (Sabella et al., 2020). The data collection techniques used in this study included direct observation, in-depth interviews, and documentation. Observation was carried out directly at the Biology and Physics Laboratory to see the physical conditions, facilities, and practicum activities. The interview was conducted with the laboratory manager, namely the science teacher who was in charge of the laboratory and was in charge of the laboratory. The interview aims to explore information about work procedures, technical obstacles, and perceptions of the effectiveness of laboratory management. Meanwhile, documentation is used to collect secondary data in inventory lists, logbooks, photos of activities, and other supporting documents relevant to the laboratory management process (Sabella et al., 2020).

The data analysis technique in this study is through the stages of analysis of the Miles and Huberman interactive model, which includes data reduction, data presentation, and conclusion drawing (Agustini, 2024). Data is reduced by selecting and sorting relevant data from observations, interviews, and documentation. Data that are not in accordance with the research focus are set aside, while relevant data are classified based on themes, such as aspects of planning, organizing, implementing, and laboratory evaluation. Furthermore, the data that has been reduced is presented in the form of a descriptive narrative that describes the field conditions in a clear and structured manner. The presentation of data is carried out in the form of narrative descriptions to explain the dynamics of laboratory management in a contextual and in-depth manner, without using statistical figures (Sabella et al., 2020). From the data that has been compiled, conclusions are drawn that refer to the objectives of the research, namely describing the actual condition of the laboratory, identifying laboratory administration and planning, knowing the organization of the laboratory, identifying the implementation of laboratory activities, identifying the safety and

security of the laboratory, understanding the management of chemicals and laboratory waste, knowing the evaluation and supervision of the laboratory, and identifying obstacles and provide solutive recommendations for the management of science laboratories at SMP Negeri 1 Kudus.

RESULT

Physical Condition and Laboratory Facilities

Based on the results of observations made on March 13, 2025, the physical condition of the science laboratory of SMP Negeri 1 Kudus shows good quality. The laboratory has two separate rooms, namely the Biology and Physics laboratories, with clean room conditions, adequate ventilation, and good lighting. The practicum equipment and materials are neatly arranged and placed in the right place with a clear labelling system.

Table 1. Laboratory Physical Condition Assessment Results

Assessment Aspects	Indicator	Information
Physical condition	Cleanliness, ventilation, lighting, and equipment fittings	Very good, clean and comfortable room
Administration and management	Tool inventory, borrowing system, usage logging	Good, but the inventory is not updated regularly
Safety and safety	Availability of PPE, emergency procedures, and understanding of SOPs	Excellent, PPE available and SOP understood
Laboratory use	Student activeness, availability of tools, and teacher guidance	Excellent, active students with adequate guidance
Supervision	Daily checklist, routine supervision, and equipment condition	Good, but the daily checklist is not available
Chemicals management	Waste storage and management	Excellent, secure storage with clear labels
Practicum readiness	Preparation of tools and materials, work instructions	Excellent, complete preparation with clear instructions

Two aspects require attention, namely administration, management, and supervision.

Laboratory Management and Administration

The results of interviews with laboratory managers show that the organizational structure of the laboratory consists of three main components: the Head of the Laboratory, who is responsible for overall planning and supervision, the Laboratory Coordinator, who manages the administration and technical needs, and the Science Teacher, who is responsible for accompanying students during practicum.

Table 2. Management Structure of the Science Laboratory of SMP Negeri 1 Kudus.

Position	Duties and Responsibilities
Head of laboratory	Overall planning and supervision of laboratory activities
Biology laboratory coordinator	Management of the administration and technical needs of the Biology lab
Physics laboratory coordinator	Management of the administration and technical needs of the Physics lab
IPA Teacher	Student mentoring and guidance during practicum

Planning for the use of laboratories is carried out with a scheduled distribution system for each class, with coordination between the manager and the science subject teacher. However, the main obstacle faced is the adjustment of schedules between teachers who often clash, so a weekly rotation system is implemented as a solution.

Occupational Safety and Security System

The work safety and security aspects showed excellent results, scoring 5. The laboratory provides personal protective equipment (PPE) for laboratory coats, masks, closed footwear, and gloves. There is also a Light Fire Extinguisher (APAR) in anticipation of an emergency.

Table 3. Availability of Security and Safety Facilities

Facility Type	Availability	Condition	Amount	Information
My laboratory	available	good	Limited	Not enough for all students
Mask	available	good	Enough	The students themselves brought some of them
Glove	available	good	Enough	Available when needed
APAR	available	good	1 unit	Maintained and ready to use
Closed footwear	available	-	-	Students use their own shoes.

Teachers and students have understood occupational safety procedures, although there is no written SOP documentation. Safety training is given to students who are members of Scientific Writing activities regularly every month.

Chemicals and Waste Management

Chemical management is done very well, using a clear labelling system and safe storage. Chemicals are stored in special cabinets taking into account their stability and potential for harmful reactions.

Table 4. Laboratory Waste Management

Types of Waste	**Management Methods**	**Dump**	**Information**
Lugol's solvent	Directly discarded	Aqueducts	Safe for the environment
Benedict's solvent	Directly discarded	Aqueducts	Safe for the environment
H_2SO_4 solvent	Special treatment	Separate	Requires neutralization
Organic waste	Regular disposal	Trash can	Harmless

The main challenge in waste management is the lack of dedicated facilities for handling hazardous chemical waste, even though these laboratories do not use significant amounts of dangerous chemicals.

The Effectiveness of Using Laboratories in Learning

The use of laboratories in learning activities shows high effectiveness. Students who are members of the Scientific Writing extracurricular consistently use the laboratory every week, while the use for the regular practicum is adjusted to the schedule of each science teacher.

Table 5. Frequency of Laboratory Use

User	Frequency	Types of Activities	Activeness
KTI Students	Weekly	Independent research and practicum	very high
Regular classes	Accidental	Scheduled practicum	high
IPA Teacher	daily	Preparation and evaluation	high

Teacher guidance is always available during the practicum, with the preparation of tools and materials before the activity starts. Work instructions are given clearly both verbally and in writing.

Constraints and Limitations

Although overall laboratory management is going well, there are several obstacles found:

1. Limited Human Resources: No special laboratory personnel are available, so all administrative and technical tasks are assigned to science teachers and coordinators.
2. Equipment Maintenance: Some tools, such as microscopes and motion system props, are found to be in a damaged condition and require repair or replacement.
3. Evaluation System: Evaluation and training have not been carried out regularly, only before the new school year or when there is a special need.
4. Documentation: A written daily checklist and formal safety SOP documentation are unavailable.

These findings show that although the management of the SMP Negeri 1 Kudus science laboratory has been running well, there is still room for improvement in human resources, equipment maintenance, and a more comprehensive documentation system.

DISCUSSION

Observations and interviews conducted on March 13, 2025 at the Biology and Physics Laboratory of SMP Negeri 1 Kudus provide a comprehensive overview of the actual condition and laboratory management at the school. The data obtained was then analyzed based on several main aspects of the management laboratory: physical conditions and infrastructure, administration and planning,

organization, implementation of activities, occupational safety, chemical and waste management, and evaluation and supervision.

Physical Condition and Infrastructure

The physical condition of the laboratory at SMP Negeri 1 Kudus is very good. The room looks clean, neatly arranged, has optimal ventilation and lighting, and a room temperature supporting practicum activities (Julian & Sumah, 2023). Existing equipment and materials are systematically stored according to their category. This is supported by a statement from one of the managers of the Biology laboratory, which also shows the storage of tools and materials. This condition is supported in the image below.

Figures 1 and 2: Physical conditions of the laboratory

Figures 3 and 4: Equipment systematically arranged by category

However, the laboratory manager also said some damaged equipment, such as microscopes and motion system props, needed repair or replacement. Another advantage lies in the large laboratory space and quite complete practicum tools.

Administrative and Planning

Laboratory administration has included inventory lists and the recording of the use of tools and materials through a logbook. This is supported in the following image.

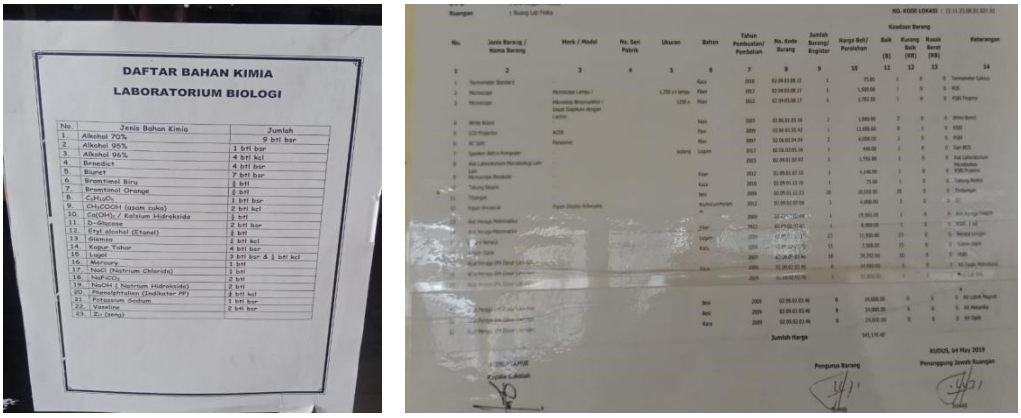

Figure 5 and 6: List of inventories in biology and physics laboratories

However, the maintenance of inventory data has not been carried out regularly, and there is no official form for loaning tools and materials. Based on the results of an interview with one of the Biology laboratory managers, it was found that the practicum planning was prepared through discussions between science teachers and laboratory managers, with a weekly rotating schedule system between classes to avoid conflicts of space use.

Although the planning went quite well, the resource person also said that evaluations of laboratory performance are rarely carried out and are only carried out at the end of each semester, and there is no continuous audit system. This condition reflects the importance of adaptive and digital-based planning management. According to (Gunawan et al., 2023), an integrated information system can help manage practicum schedules and needs efficiently and reduce conflicts in the use of laboratory space.

Laboratory Organization

The laboratory management's organizational structure consists of the laboratory's head, the science teacher, and the administrative coordinator. However, SMP Negeri 1 Kudus does not yet have a specialised laboratory that handles technical aspects and equipment maintenance full-time. The division of tasks is still informal, and most technical responsibilities are still imposed on science teachers. This shows that a double workload can reduce the effectiveness of laboratory management. The absence of professional laboratory personnel is a common problem in high schools, as conveyed by (Rahmah et al., 2021). Practicum requires support from various parties, such as laboratory personnel who assist teachers in implementing the practicum in the laboratory.

Implementation of Laboratory Activities

Laboratories function in supporting student learning activities, one of which is practicum activities. The implementation of the practicum went quite well, especially for students who are members of the Scientific Writing (KTI) extracurricular activities and routinely use the laboratory. The teacher always

accompanies the students during the practicum and ensures the tools and materials are available before the activity starts.

Figure 7 and 8: Photos of student practicum activities at SMP N 1 Kudus

In addition, students were also taught about SOPs for laboratory use, which were delivered orally, especially regarding the use of Personal Protective Equipment (PPE) such as laboratory coats and masks. Implementing SOPs is one of the administrative controls that, if carried out consistently, will reduce exposure to potential hazards and the risk of injury (Cahyaningrum, 2020). However, the written SOP is unavailable and has not been socialised evenly to all students. Written SOPs are important to form a safe work culture in the laboratory. A study by (Hoback & Abdallah, 2019) demonstrates that clear and documented SOPs can significantly reduce the risk of laboratory accidents.

Laboratory Safety and Security

Laboratory safety and security management is a shared responsibility for laboratory managers and users; therefore, everyone involved must be aware of the need to regulate, maintain, and strive for occupational safety (Sangi & Tanauma, 2018). The safety aspect of the laboratory at SMP 1 Kudus has been well considered. It can be seen that PPE includes laboratory coats, gloves, masks, and closed footwear. Safety procedures have been socialized orally but not supported by written documents. In addition, a Light Fire Extinguisher (APAR) is available in anticipation of a fire, and hazardous materials handling procedures are carried out according to standards, even though no chemicals are classified as very dangerous in the laboratory.

Figure 9: Light fire extinguisher

Occupational safety training is carried out on a limited and non-routine basis. According to research (Dvorski et al., 2023), Structured and repetitive safety education is essential in creating a safe laboratory environment, especially for teenage students.

Chemicals and Waste Management

Chemical management has been done by storing them in labelled cupboards. Practicum waste, such as Lugol and Benedict solutions, is discharged into waterways, while H_2SO_4 solutions are handled separately. Although there are no large quantities of hazardous chemicals yet, the laboratory does not yet have written procedures or special facilities for chemical waste disposal. This aligns with the findings (Saifuddin et al., 2023), which show that many schools do not have a standard waste management system. In fact, this procedure is important to ensure the safety of the environment and laboratory users.

Evaluation and Supervision

Supervising laboratory use is carried out informally. There is no daily checklist or written supervision report, although the teacher carries out tool checks regularly. Evaluation of laboratory performance is only carried out before school accreditation. As a result, the tool's repairs and updates do not occur regularly. This confirms the importance of formative and documentary evaluations in laboratory management. According to the findings (Zarbo, 2022), Structured supervision can drive continuous improvement and data-driven decision-making.

Constraints and Recommendations

This study reveals a number of main obstacles in the management of science laboratories at SMP Negeri 1 Kudus. One of the most prominent obstacles is the lack of special laboratory personnel who professionally handle the technical aspects of the laboratory. All technical and administrative responsibilities are still

imposed on science teachers, which causes the workload to be multiplied and can potentially interfere with the effectiveness of learning and laboratory management itself. In addition, inventory maintenance activities have not been carried out regularly and in a structured manner. Inventory data is available, but regular updates and checks on the appliance's condition are still not standard procedures. This can result in delays in detecting equipment damage, which ultimately interferes with the course of the practicum.

The availability of Personal Protective Equipment (PPE) is also still limited. Although some students brought PPE independently, the resource person also said that the laboratory has not been able to provide an adequate amount of safety equipment for students. This situation can increase the risk of accidents, especially if the practicum involves potentially hazardous materials or tools. On the other hand, the lack of a written Standard Operating Procedure (SOP) document is a significant weakness. Although procedures have been communicated orally, the absence of official documents makes laboratory safety and etiquette standards less consistent and difficult to audit.

Another obstacle that is no less important is the limited budget available for procuring new equipment and maintaining existing facilities. This condition causes some practicum tools to be damaged or not optimally used, as well as to slow down the process of modernizing laboratory facilities according to curriculum developments and learning needs.

To overcome these problems, a number of strategic steps are needed. One of them is by proposing the appointment of laboratory personnel or special technical staff to serve in the laboratory. The existence of these professionals is very important to ensure the smooth and safe of practicum activities. Furthermore, it is necessary to maintain inventory regularly, at least once per semester. This maintenance includes checking the appliance's condition, repairing minor damage, and updating inventory data. The laboratory also needs to be equipped with sufficient PPE so that all students can run the practicum safely according to occupational safety standards.

To foster a safe and orderly work culture, preparing written SOPs is an urgent priority. This document must include guidelines for using tools, safety procedures, laboratory rules, and damage reporting flows. SOPs will help teachers, students, and all laboratory users carry out activities consistently and safely. In addition, it is necessary to provide formal forms for loaning tools and materials to support a more orderly and documented administrative system. Occupational safety training also needs to be held periodically for teachers and students so that all parties have the same understanding of safety procedures in the laboratory environment. Finally, laboratory evaluation and audit systems must be formed in a more structured manner. Evaluations are carried out before accreditation and are a regular part of laboratory management to ensure that all facilities and procedures run according to the set standards. With the consistent implementation of these recommendations, it is hoped that laboratory management at SMP Negeri 1 Kudus can run more effectively, safely, and support the quality science learning process.

Although the results of this study provide a fairly comprehensive overview of the management of the science laboratory at SMP Negeri 1 Kudus, several limitations need to be considered. The research was carried out to coincide with implementing the Final Semester Exam (UAS), which caused the laboratory room to be used as an additional exam room. As a result, much laboratory equipment is moved to other rooms so that observations of spatial planning, completeness of facilities, and actual laboratory conditions cannot be carried out optimally. This situation also affects the completeness of the observation data, especially in assessing the effectiveness of spatial planning and the readiness of practicum tools under normal conditions. Therefore, the findings in this study need to be understood in the context of time constraints and space conditions that are not fully representative.

The suggestions in this study are intended to improve and develop studies in the future. Considering that the observation was carried out to coincide with the Final Semester Exam (UAS), the laboratory room was used as an additional exam room, so that many laboratory equipment was moved to another place. This causes the spatial arrangement and laboratory conditions not to be optimally monitored. Therefore, it is recommended that observations in the next study be carried out outside the exam period or during major school activities so that laboratory conditions can be more representative. In addition, coverage informants can involve students and janitors in digging up more information about the day-to-day use and maintenance of the laboratory. More structured visual documentation and strengthening analysis through an in-depth literature review can also increase the richness and sharpness of data interpretation. With these steps, it is hoped that the results of the next research will be able to provide a more complete picture and a stronger contribution to the development of educational laboratory management.

REFERENCES

Agustini. (2024). *Metode Penelitian Kualitatif (Teori & Panduan Praktis Analisis Data Kualitatif)* (Issue May 2024).

Cahyaningrum, D. (2020). Program Keselamatan dan Kesehatan Kerja Di Laboratorium Pendidikan. *Jurnal Pengelolaan Laboratorium Pendidikan*, *2*(1), 35–40. https://doi.org/10.14710/jplp.2.1.35-40

Chen, L., & Yang, J. (2016). *Research on the Current Situation and Countermeasures of the College Laboratory Safety Management*. *63*(Amahs), 23–27. https://doi.org/10.2991/amahs-16.2016.6

Dvorski, M., Vitale, K., & Janda, R. (2023). Sigurnost studenata u sveučilišnim laboratorijima. *Sigurnost*, *65*(2), 201–210. https://doi.org/10.31306/s.65.2.6

Gunawan, A., Wahyuni, N., Kiswindyatmoko, R., B. Katili, P., & R. Barleany, D. (2023). Perancangan Sistem Informasi Pengelolaan Praktikum Berbasis

Website. *Jurnal Teknik*, *21*(1), 17–31. https://doi.org/10.37031/jt.v21i1.284

Hoback, A. S., & Abdallah, A. R. (2019). Safety protocols in civil & environmental engineering laboratories. *ASEE Annual Conference and Exposition, Conference Proceedings*. https://doi.org/10.18260/1-2--33251

Julian, M., & Sumah, A. S. W. (2023). Analysis of science laboratory facilities at Junior High School Bina Ilmi, Palembang City, Indonesia. *Jurnal Pijar Mipa*, *18*(4), 472–477. https://doi.org/10.29303/jpm.v18i4.4813

Opperman, C. J., Singh, S., & Barton, F. (2022). Appropriate disposal of waste in the laboratory: Neglected but not forgotten. *African Journal of Laboratory Medicine*, *11*(1), 1–2. https://doi.org/10.4102/ajlm.v11i1.1786

Rahmah, N., Iswadi, I., Asiah, A., Hasanuddin, H., & Syafrianti, D. (2021). Analisis Kendala Praktikum Biologi di Sekolah Menengah Atas. *Biodik*, *7*(2), 169–178. https://doi.org/10.22437/bio.v7i2.12777

Sabella, A., Syafei, H., Habibah, U., & Saraswati, R. R. (2020). Analysis of Chemical Laboratory Management at SMAN 55 Jakarta. *Risenologi*, *5*(1), 70–79. https://doi.org/10.47028/j.risenologi.2020.51.67

Saifuddin, M. F., Istiqomah, M. N., & Jannah, N. (2023). Waste Management of High School Biology Laboratory in Yogyakarta City. *Indonesian Journal of Biology Education*, *6*(1), 41–45. https://doi.org/10.31002/ijobe.v6i1.639

Sangi, M. S., & Tanauma, A. (2018). Keselamatan Dan Keamanan Laboratorium IPA. *Jurnal MIPA*, *7*(1), 20. https://doi.org/10.35799/jm.7.1.2018.18958

Setiya Rini, E. F., Bramastia, B., Aditia, K., Fitriani, F., & Siswanto, P. (2024). Analysis of Science Laboratory Management to Support Science Learning: A Systematic Review. *Integrated Science Education Journal*, *5*(1), 49–58. https://doi.org/10.37251/isej.v5i1.799

Yator, F., & Kipchumba, S. (2023). *Kabarak Journal of Research & Innovation www.kabarak.ac.ke RESEARCH ARTICLE*. *13*(1), 1–9.

Zarbo, R. J. (2022). Management Systems to Structure Continuous Quality Improvement. *American Journal of Clinical Pathology*, *157*(2), 159–170. https://doi.org/10.1093/ajcp/aqab109

Zohoun, A., Agbodandé, T. B., Kpadé, A., Goga, R. O., Gainsi, R., Balè, P., Sambo, B. M., Charlebois, R., Crane, R., Merkel, M., Anani, L., & Milgotina, E. (2021). From benchmarking to best practices: Lessons from the laboratory quality improvement programme at the military teaching hospital in Cotonou, Benin. *African Journal of Laboratory Medicine*, *10*(1), 1–7. https://doi.org/10.4102/AJLM.V10I1.1057