

Effectiveness of Laboratory Management in Efforts to Improve the Quality of Practical Work in the Food Processing Laboratory

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Abstract: This study aims to describe and analyze the laboratory management in food management laboratories and evaluate the supporting and inhibiting factors in laboratory management that affect the quality of practical sessions. The research uses a qualitative descriptive method. The results show that the management of food management laboratories includes planning, organizing, implementation, supervision, and evaluation. Supporting and inhibiting factors affecting the quality of practical sessions are analyzed based on aspects of planning, implementation, practical session evaluation, laboratory human resources, facilities and infrastructure, as well as the timing of practical activities. In conclusion, the application of laboratory management functions in food management laboratories is generally effective, although some challenges remain. Supporting factors for practical session quality include well-prepared practical session planning, the presence of lecturers and laboratory assistants during practical sessions, student participation in maintaining laboratory cleanliness, competent teaching staff, availability of facilities and infrastructure, and sufficient time for practical activities. Inhibiting factors include the absence of practical session guidelines, limited practical session time, suboptimal human resource ratios, and the need for improvements in both the quality and quantity of laboratory facilities and infrastructure.

Keywords: Laboratory Management, Culinary Arts, Quality of Practicum

INTRODUCTION

Law No. 20 of 2003 on the National Education System states that education is an effort to improve human quality through the development of inherent potentials. Being dynamic in nature, education continuously evolves in line with the development of time, thus requiring appropriate management to ensure the achievement of educational goals (Badrudin, 2015). One form of educational management implementation is laboratory management. Laboratory management is a collaborative process among leaders to use all equipment, materials, facilities, and human resources effectively and efficiently (Sari, 2013). Effective and efficient laboratory management is expected to enhance the quality of practical activities. According to (Neng Gustini & Wulandari, 2020), planned and organized science laboratory management, with proper administration and adequate funding, has

the potential to improve student outcomes, especially in biology subjects. Laboratory management is crucial as it ensures the effective and efficient conduct of learning and practical activities (Sari et al., 2018). It can be concluded that good laboratory management positively impacts the quality and success of student practical activities.

Laboratory management is an effort to direct resources such as human resources, funds, equipment, and facilities efficiently and effectively to achieve the set objectives (Neng Gustini & Wulandari, 2020). According to Silvia et al., (2022) optimal laboratory management requires the execution of laboratory management functions, namely planning, organizing, implementation, and supervision. Another opinion, according to Fiska et al., (2021) suggests that laboratory management is influenced by aspects such as planning, organizing, administration, arrangement, and security. It can be concluded that to achieve effective laboratory management, educational institutions should apply the main functions of educational management, namely planning, organizing, implementation, and supervision and evaluation. Properly managed laboratories contribute positively to the institution's mission, particularly in achieving quality education.

Laboratory Planning involves analyzing and fulfilling the laboratory resource needs, including facilities, personnel, equipment, and materials for the upcoming period. Planning includes all the needs related to laboratory activities, such as equipment, materials, infrastructure, administration, and other necessary supplies (Adriani, 2016). According to Sari (2013), comprehensive laboratory planning indeed covers various aspects, such as the procurement of practical equipment and materials, scheduling practical activities, funding allocation, and laboratory development strategies. In planning these aspects, it is essential to consider specific needs, financial capabilities, compliance with safety guidelines, and long-term goals for the laboratory.

Laboratory Organization involves assigning tasks among laboratory managers. Organizing is the second function in laboratory management, aimed at carrying out administrative tasks within the laboratory. The laboratory must be legally recognized and have a documented organizational structure as a guarantee of service (Berte, 2007:776). The presence of an organizational structure is crucial, supported by the implementation of roles in each organizational function. Activities in organizing the laboratory include workload management, arrangement of equipment and materials, maintaining order and safety in the laboratory (Sari, 2013). Positions required in the laboratory's organizational structure include laboratory heads, laboratory assistants, and technicians (Adriani, 2016). Laboratory management is overseen by the laboratory head, supported by laboratory assistants for specific laboratories (Tone, 2017).

Implementation Activities are the core activities of the laboratory. All human resources and facilities, as well as other supporting components, are mobilized to support optimal laboratory activities. These activities include operating equipment, using materials in practical work, research, experiments, and community service (Puspita, 2020). Supervision is necessary to ensure that equipment remains

functional and to prevent damage that may disrupt the learning process. Laboratory control is also essential to monitor the overall condition of the laboratory and maintain a conducive situation. The supervision function is intended to control the work to prevent deviations from the established objectives. Important information can be obtained through this activity (Puspita, 2020). Evaluation activities are conducted to improve the quality of processes and results in every laboratory activity (Puspita, 2020). If the evaluation results are still poor, improvements are necessary; if the results are already good, further development is needed. Evaluation activities in laboratory management include assessing activities and outputs achieved. Evaluation serves as an assessment of performance to improve program quality. Monitoring is a form of supervision carried out by laboratory managers to oversee the implementation of laboratory management. Monitoring activities include controlling daily laboratory activities, supervising practical work, overseeing the arrangement of equipment and materials, and monitoring the maintenance and performance of practical equipment (Richard Decaprio, 2013).

According to Permenpan RB No. 3, 2010, an educational laboratory is a facility at an educational institution, which can be a permanent or mobile, open or closed room. The laboratory is used for educational, research, and community service activities with materials and equipment that meet scientific standards and methods. Furthermore, Ministerial Regulation No. 24 of 2007 establishes standards for laboratory facilities, including space capacity, a minimum land area of 2.4 m² per student, adequate lighting, furniture, educational tools such as teaching aids and practical materials, media, consumables, and other equipment supporting laboratory activities. According to Ahmad Sonhadji, (2002), laboratory management indicators include space organization, equipment and material control, working conditions, safety, maintenance, repair, and replacement of facilities. Space organization is closely related to determining room layouts, including the arrangement of floors, door placements, windows, traffic flow, equipment, furniture, storage, and instructor and technician rooms (Ahmad Sonhadji, 2002). In the context of educational laboratories, space organization can be used to project future needs based on the number of prospective students, space requirements, and time availability each week (Ahmad Sonhadji, 2002).

The structure of laboratory staff is also regulated in Permendiknas No. 26, 2008, which includes personnel such as laboratory heads, technicians, and laboratory assistants. This regulation also outlines the competencies that laboratory staff must possess, including personal, social, managerial, professional, and administrative skills. Effective laboratory management relies on a well-organized structure, clear task delegation, optimal use of facilities, and orderly administration (Sari, 2013). According to Rosada et al., (2017) well-managed laboratories are characterized by effective equipment, efficient organization, health and safety measures, activity control, and psychological well-being. According to Berte, (2007) there are structural and non-structural elements in laboratory design that can influence planning, layout, and safety, including workflow, equipment placement, equipment classification, ventilation, lighting, piping, electrical wiring, and communication systems.

Practical Work plays a vital role in bridging theory with practice, enhancing students' interest and engagement in learning, correcting misconceptions, and developing students' critical and analytical thinking skills (Maknun, 2017). Practical work requires supporting facilities, including the laboratory room, equipment, materials, and safety and health provisions. Educational laboratories are facilities that serve as training grounds for specific skills according to the field of expertise. According to Agustina et al., (2019), the adequacy of facilities and infrastructure in the laboratory plays a crucial role in the quality and success of practical activities. Additionally, the success of practical work is determined by reliable laboratory management, including management of practical work, laboratory utilization, planning, administration, and structured organization, implementation, and evaluation. According to Daryanto, (2018) laboratory management involves the effective and efficient coordination of people, finances, equipment, facilities, and other physical elements to achieve optimal results.

The Quality of Practical Work is synonymous with the quality of the learning process in the laboratory. Educational quality is influenced by many factors, including the professionalism of educators, the availability of learning facilities and media, institutional culture, students, teaching methods, and the nature of the implemented programs

(Rosada et al., 2017). Practical work consists of three main stages: planning, implementation, and evaluation. Each stage includes components that determine the overall quality of the practical work. These stages serve as the foundation for effective and practical student learning (Wahyudiati, 2016).

This research was conducted at the Food Processing Laboratory, Department of Culinary Arts, Faculty of Engineering, Surabaya State University. According to data from the website of the Culinary Arts Program, Faculty of Engineering, Surabaya State University (2023), there are 9 food processing laboratories, including: Food Processing Laboratory 1, 2, and 3; Food Technology Laboratory; Cafeteria Laboratory; Chocolate Laboratory; Science Laboratory; Pastry and Bakery Laboratory; and Restaurant Laboratory. Each laboratory is equipped with equipment tailored to the practical needs. In terms of management structure, there are three lecturers, each responsible for one laboratory, acting as sub-laboratory heads, and three supporting staff (laboratory assistants, technicians, or educational laboratory staff) also responsible for each laboratory. The large number of laboratories requires strong management support, especially in terms of human resources, equipment, and facilities. From a human resources perspective, there must be an ideal ratio between students, laboratories, lecturers, and supporting staff to maximize laboratory activities.

The Food Processing Laboratory at the Faculty of Engineering, Surabaya State University, serves various activities, including practical work, research, and community service (PKM) for the academic community at Unesa and functions as a business unit. Each semester, practical activities are adjusted according to the scheduled courses. In the odd semester of 2023/2024, the laboratory serves 10 practical courses from three different faculties. Thus, there is limited time for laboratory use as it serves three study programs each semester. In addition to the limited time, the ratio of equipment to students affects

the effectiveness of practical activities. Adequate human resource support, both in terms of quantity and quality, is also essential. The high workload of laboratory staff should be considered in laboratory management. Therefore, with these urgencies, it is expected that solutions can be found through effective laboratory management. The goal is to ensure that practical activities, research, and community service (PKM), as well as business unit activities utilizing laboratory facilities, run optimally, effectively, and efficiently. Therefore, structured management is expected to provide positive impacts for all users and help achieve the set objectives.

Based on the observations, effective laboratory management is necessary. Good laboratory management requires support from all elements of the laboratory management system to function optimally. The implementation of good laboratory management is expected to provide optimal service and enhance the quality of practical activities.

METHOD

The research method used in this study is qualitative descriptive research. According to Sugiyono (2017), qualitative descriptive research is an approach to understanding the natural conditions of an object, with the researcher acting as the primary instrument. This study was conducted to explore data related to the effectiveness of laboratory management in improving the quality of practical work in the Food Processing Laboratory, aiming to obtain a comprehensive and in-depth understanding. Data was gathered through interviews with practical course lecturers, laboratory assistants/technicians/PLP, and student practitioners, as well as from the research site, specifically the food processing laboratory, practical activities, and the equipment and materials used for the practical work. In addition, document data included laboratory facilities and infrastructure, organizational structure, roles and functions of laboratory managers, the laboratory head's work program, inventories of equipment and materials, usage schedules, laboratory usage journals, administrative records, Standard Operating Procedures (SOPs) for equipment usage and maintenance, SOPs for Occupational Health and Safety (K3), regulations, practical work grades, the Semester Learning Plan (RPS) of lecturers, and other relevant documents. Data collection techniques included observation, interviews, and documentation, with qualitative data presented descriptively. Data analysis followed the interaction model of Miles dan Huberman (Sugiyono, 2017) consisting of data condensation, data presentation, and conclusion drawing/verification. The validity of the data was tested through credibility, dependability, confirmability, and transferability to ensure that the research findings are accurate, reliable, and accountable in accordance with the research objectives.

RESULT AND DISCUSSION

RESULT

The results of this study are the research findings from the implementation of management functions, as well as the supporting and inhibiting factors in laboratory management that affect the quality of practicum, as follows:

Planning Function

Based on the research conducted regarding laboratory management in the Food Processing Laboratory at the Faculty of Engineering, State University of Surabaya, the research findings on the planning function include the planning of laboratory activities (practicum, research, and community service (PKM)), as well as planning for the procurement of equipment and materials. Based on the interviews conducted with the sources, namely lecturers, laboratory technicians, and students, it was stated that in the planning of laboratory activities, which include practicum, research, and community service, the planning was well-organized, where each individual has a clear role, and the documents prepared were also neat and complete. Lecturers guide students in practicum planning, group organization, scheduling, and evaluation, while students and laboratory technicians each have their tasks in preparation, implementation, and laboratory setup.

This statement is supported by documentation of the completeness of data and documents, such as laboratory schedules, practicum planning, and standard operating procedures (SOP) for equipment. Based on the interviews with lecturers, laboratory technicians, and students, it was stated that in the procurement of equipment and materials, the laboratory technician, lecturer, and head of the sub-laboratory collaborate in preparing procurement documents, which are then reported to the Vice Dean for further action by the Faculty of Engineering procurement team, conducted once a year. This statement is reinforced by documentation of the planning for procurement of equipment and materials.

Organizing Function

There were research findings on the sub-focus of laboratory organization, which include the arrangement of management duties, equipment, materials, rules, and safety and health (K3) protocols in the laboratory. Based on the interviews with the sources, it was found that the current organizational structure of the laboratory is still linked to the faculty, led by the dean, overseeing the head of the laboratory for teaching and research, as well as the head of each sub-laboratory per study program who supervises technicians or laboratory assistants in each laboratory. This statement is supported by documentation of the laboratory's organizational structure at the Faculty of Engineering, Unesa, as well as official letters about the appointment of sub-laboratory heads and technicians. The research findings regarding the duties and functions of laboratory management indicate that the duties of laboratory managers are systematically organized in the laboratory's standard operating procedures (SOP). Each manager has an official letter outlining their respective responsibilities. The laboratory head is responsible for planning, managing, implementing, coordinating, supervising, and

evaluating laboratory activities, while the sub-laboratory head assists the laboratory head in these tasks. Laboratory technicians and assistants support the laboratory head and sub-laboratory head in carrying out daily operations. This statement is supported by documentation of the Laboratory Management Duties and Functions Regulations at the Faculty of Engineering, Unesa. Research findings related to the arrangement of equipment show that the activities of organizing and classifying laboratory equipment and materials have been running well. Equipment and materials are stored neatly and safely, classified by type, which facilitates monitoring and accessibility. The classification includes general and specific materials, as well as equipment categories 1, 2, and 3, including classification of base materials such as ceramics, stainless steel, plastic, iron, enamel, wood, stone, and electrical components. This statement is supported by the researcher's observations of the equipment and materials arrangement activities in the Food Processing Laboratory, as shown below.



Figure 1.1 Ceramic Equipment Arrangement

Research findings related to the organization of laboratory rules and K3 (safety and health) indicate that the availability of laboratory rules and K3 measures is complete, with rules that are easy to monitor, along with personal protective equipment (PPE), fire extinguishers (APAR), and safety signage (K3) such as evacuation routes and electrical shutdown warnings. Although the facilities are adequate, the water drainage system and waste treatment still need improvement. This statement is supported by documentation of the laboratory's rules and K3.

Implementation Function

Research findings on the sub-focus of laboratory activities implementation show that the laboratory activities (practicum, research, and PKM) are running smoothly according to the scheduled plan. Lecturers and laboratory assistants are consistently present to accompany practicum activities until completion, with laboratory assistants playing a role in operating equipment and using materials. This statement is supported by observations of practicum activities in the laboratory, as shown below.



Figure 1.2 Practicum Activities Implementation in the Laboratory

Research findings regarding the procurement of equipment and materials, based on interviews with the sources, indicate that although the activities run smoothly, there are still challenges, especially in procuring specialized equipment that is difficult to find, thus extending the process. This statement is supported by documentation related to the procurement planning for equipment and materials.

Supervision

Research findings regarding supervision activities, based on interviews, show that supervision of laboratory activities, including practicum, research, and PKM, runs smoothly. Lecturers and laboratory assistants consistently attend every activity in the laboratory. In the initial stage, lecturers supervise the completeness of practicum planning and the use of laboratory coats and related attributes, while laboratory assistants monitor administrative documents, such as usage logs and equipment loan documentation. During implementation, lecturers supervise students' work methods, and laboratory assistants monitor the use of equipment, materials, and laboratory facilities. At the final stage, lecturers and laboratory assistants ensure laboratory cleanliness, and laboratory assistants check the return of equipment in accordance with loan documents. These findings are reinforced by the observations and documentation as shown below.



Figure 1.3 Supervision of Practicum Activities by the Lecturer

Research findings based on interviews with the sources show that supervision of the procurement of equipment and materials also runs smoothly, where all laboratory managers are actively involved in the process. The sub-laboratory head and laboratory assistants jointly check the condition of the received goods, ensuring that the procurement documents match the quality and quantity of the received equipment.



Figure 1.4 Supervision of Laboratory Equipment Procurement

Supporting and Inhibiting Factors of Practicum Quality Planning Activitie

Research findings on the supporting factors for the success of practicum planning, based on interviews, include the availability of practicum planning, guidance from lecturers, identification of equipment and materials by students, and coordination with laboratory assistants regarding practicum implementation and the borrowing of equipment and materials. This statement is supported by documentation of practicum implementation plans, practicum logs, and equipment and material loan documents. Research findings on the inhibiting factors of practicum quality, based on interviews, include the lack of complete practicum manuals for each course and students' low understanding of the material.

Implementation Activities

Research findings on supporting factors for practicum quality in the implementation phase, based on interviews, show that the active presence of lecturers and laboratory assistants accompanying and supervising practicum activities is a key supporting factor. The availability of competent lecturers in their respective fields and laboratory assistants with relevant educational backgrounds and skills are crucial. In terms of facilities, the availability of furniture, water and electricity facilities, as well as adequate equipment and materials for the practicum, are the main factors supporting practicum quality. Regarding time, the availability of sufficient time for practicum activities is a supporting factor.

Research findings on inhibiting factors in practicum implementation, based on interviews, include the lack of quantity and quality of equipment, inadequate air circulation, unsuitable floor types, and insufficient practicum time. The equipment-to-student ratio is also suboptimal, which is a barrier. The ratio of equipment to students is less than ideal, requiring an improvement in the quality and quantity of practicum equipment and materials, as well as an improvement in water facilities, air circulation, and floor types in the laboratory. In addition, the quantity and quality of lecturers and laboratory assistants need to be improved, with an ideal educator-to-student ratio to support practicum smoothness. From the time aspect, inefficient student time management, the need for better group cooperation, and limited laboratory time due to sharing with other programs are also barriers. These findings are supported by observations by the researcher as follows.



Figure 1.5 Air Ventilation in the Food Processing Laboratory

Evaluation Activities

Research findings on supporting factors for practicum quality in the evaluation phase, based on interviews, show that evaluations are conducted jointly by lecturers and students on the practicum

product, the return of equipment in clean condition, and the maintenance of laboratory cleanliness by students, which are factors that support practicum quality. This statement is supported by documentation of the evaluation implementation, as shown below.



Figure 1.6 Evaluation of Practicum Products

Research findings on inhibiting factors in the evaluation activities, based on interviews, indicate that the diversity of dishes causes uncertainty in the concept of standard dishes, making it difficult to assess the products accurately.

DISCUSSION

The discussion related to the research findings to be elaborated upon concerns the implementation of laboratory management functions, which include planning, organizing, implementation, supervision, and evaluation in the Food Processing Laboratory at the Faculty of Engineering, Unesa. Additionally, the following research findings are related to the supporting and inhibiting factors in laboratory management that may affect the quality of the practicum. These factors are examined from the aspects of planning, implementation, evaluation, human resources, facilities, and the availability of practicum time.

The research findings regarding laboratory management in the Food Processing Laboratory at the Faculty of Engineering, Unesa, cover the implementation of the functions of planning, organizing, implementation, supervision, and evaluation. These findings are in line with the research by Silvia et al., (2022) which states that for optimal laboratory management, it is necessary to implement laboratory management functions, namely planning, organizing, implementation, and supervision. The study found that the implementation of laboratory management functions has been carried out well, although there are still several challenges, particularly in the functions of implementation and supervision. Based on the research findings on the implementation of activities in the laboratory, including practicum, research, and community service, there are challenges related to laboratory facilities, such as inadequate water facilities, floor safety, and insufficient air circulation in the laboratory. This undoubtedly impacts the quality of the practicum, particularly in terms of the implementation phase.

Based on the research findings regarding the practicum implementation activities, the inhibiting factors for practicum quality include the insufficient quantity and quality of equipment, inadequate air circulation, inappropriate floor types, and insufficient time for implementation. Additionally, the quantity and quality of lecturers and laboratory assistants need improvement, with an ideal ratio of

educators to students to support the smooth running of the practicum, ineffective student time management, the need for better group cooperation, and limited laboratory time due to sharing with other study programs. These findings are supported by

Wahyudiati, (2016) which stated that practicum implementation is influenced by the role of lecturers in guiding and mentoring throughout the practicum process, students' understanding and adherence to established methods, the availability of laboratory facilities, and student motivation. This is also in line with the research by Hasrudin & Rezeqi, (2012) which states that practicum implementation is influenced by laboratory conditions, execution time, preparation, and practicum reporting. In other research, Raharjo & Harjanto, (2017) found that laboratory equipment must always be in a ready-to-use, clean, functional, calibrated state, and meet the necessary quantity and quality standards. Another study by Muldayanti & Kurniawan, (2021) mentioned that practicum implementation in the laboratory depends on the availability of equipment and materials; if these are adequate, the practicum can proceed smoothly. The lack of equipment and materials in the laboratory significantly impacts the execution of practicum activities. Ideally, the quality and quantity of equipment should be sufficient for the smooth operation of practicum activities. The equipment-to-student ratio must also be appropriate, and the materials must be available and sufficient for practicum activities.

The research findings on the implementation of laboratory management functions in the aspect of planning for the procurement of practicum equipment and materials have been well-executed. The procurement plan includes detailed information such as equipment names, quantities, specifications, and prices according to the allocated budget. However, there were research findings on the implementation of the procurement process, where procurement of specialized equipment with specific specifications is difficult to find, thus lengthening the process. This has led to delays in the procurement of equipment and materials, despite the planning phase being carried out effectively. These findings correlate with the research findings on inhibiting factors affecting practicum quality in the implementation phase, namely the insufficient number of equipment. These findings align with the research of

Sembiring & Siliwangi, (2017) which states that procurement is an effort to realize the planned needs as determined and approved in the budget. The goal is to obtain goods and services according to requirements, ensuring that the best goods and services are obtained, identifying the best equipment procurement partners, building good relationships with partners, negotiating technical aspects, and preparing for the possibility of goods scarcity, price increases, and product development plans. Equipment procurement often faces challenges, such as shortages of equipment at specific times or due to limited or scarce equipment in the market, necessitating a specific procurement mechanism based on organizational policies.

The research findings on the aspect of laboratory management regarding the supervision function show that laboratory activities are running smoothly. Lecturers and laboratory assistants are consistently present during laboratory activities. In the initial stages, lecturers supervise the completeness of practicum planning and the use of laboratory coats and related attributes. Laboratory assistants supervise laboratory administrative documents, such as the completion of the laboratory usage log and the completeness of equipment loan documentation. During the implementation stage, lecturers supervise students' work methods, while laboratory assistants monitor the use of equipment, materials, and laboratory facilities. At the final stage, lecturers and laboratory assistants supervise laboratory cleanliness. Laboratory assistants also supervise the return of equipment in accordance with the equipment loan documentation. These research findings are supported by Gusnani, (2019) which states that supervision in laboratory management is carried out across all functions—planning, organizing, and implementation. The focus of supervision activities is on errors, deviations, defects, and others. Increasing supervision across all aspects of laboratory management will be effective in achieving the established goals. Therefore, it can be concluded that the effectiveness of supervision activities in practicum implementation has an impact on the quality of the practicum in terms of implementation.

There were research findings on the supervision of the procurement of equipment and materials, which proceeded smoothly. All managers played their roles effectively in carrying out supervision activities. The sub-laboratory head and laboratory assistants jointly examined the condition of the distributed goods. There was consistency between the procurement documents and the quality and quantity of the equipment and materials received. These research findings are supported by Ariyanti, (2013) which mentions that phenomena related to the effectiveness of goods procurement include the timeliness of delivery, the accuracy of the quantity of items delivered according to the criteria set in the procurement documents, and the conformity of the goods' quality with the criteria specified in the procurement documents. Therefore, based on the research findings above, laboratory management activities significantly affect practicum quality. These findings are also supported by Indriyanti, (2021) who states that the effectiveness of laboratory use is an essential part of the learning process that can contribute significantly to improving the quality of education.

CONCLUSION AND SUGGESTIONS

CONCLUSION

Based on the elaboration above, it can be concluded that the management of the Food Processing Laboratory at the Faculty of Engineering, Unesa, includes the implementation of the functions of planning, organizing, mobilizing, supervising, and evaluating. The planning aspect is examined in terms of laboratory activities planning (practicum, research, and community service) and the procurement of practicum equipment and materials. The organizing aspect is examined in terms of the laboratory's organizational structure, the roles and functions of laboratory managers, the arrangement of equipment

and materials, and the laboratory's rules and occupational health and safety (OHS). The implementation and supervision aspects are examined based on the implementation and supervision of laboratory activities (practicum, research, and community service) as well as the procurement of practicum equipment and materials. Overall, these functions are well-implemented, although there are still challenges that need to be addressed to achieve the organization's goals. There are supporting and inhibiting factors in laboratory management that affect the quality of the practicum. These factors are examined in terms of planning, implementation, evaluation, human resources, facilities and infrastructure, and the availability of time for practicum activities.

SUGGESTIONS

It is recommended that future research focus more specifically on a deeper discussion and be able to provide solutions to the challenges faced by the organization.

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