

# Laboratory Management in Improving School Quality (Case Study at SMA Negeri 3 Bandar Lampung)

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**Abstract:** - Good laboratory management depends on several factors which are interrelated with one another. The purpose of this study is to analyze and describe: biological laboratory planning, implementation of biological laboratories, controlling biological laboratories, and follow-up of biology laboratories at SMA Negeri 3 Bandar Lampung. The method used in this research is qualitative with a case study design. This research data collection technique using in-depth interviews, participant observation, and document study. The data source of this study amounted to 8 people with the main informants of the school principal and supporting informants, namely the laboratory coordinator, the head of the laboratory, the biology teacher and students. The results showed that (1) laboratory planning which includes planning, collecting data to get obstacles and determining the time for developing biological laboratories in improving the quality of schools, (2) Implementation of laboratories which includes establishing laboratory activities to create an organizational structure and determining who is responsible in the biology laboratory in improving the quality of schools, (3) Control activities are carried out by preparing a schedule for practicum activities, practicum service activities, learning processes with practicum, and procurement of practicum tools and materials in improving school quality, (4) Laboratory follow-up includes follow-up supervision and follow-up laboratory implementation in improving school quality.

**Keywords:** Management, biology laboratory, school quality.

## I. INTRODUCTION

Educational management is a management process in the implementation of educational tasks by utilizing all sources of infrastructure to achieve goals effectively. According to Engkoswara (2010: 87), education management is seen as an activity that combines educational resources so that it can be centered in efforts to achieve predetermined educational goals.

The learning facilities and infrastructure factors also play an important role in helping teachers and students improve school quality. According to Ismaya (2015) there are three scopes of infrastructure, namely: (1) seen from the exhaustion of use; (2) in terms of moving or not; and (3) relationships in the learning process.

A school that can function properly requires supporting facilities and infrastructure, including a laboratory. Biology laboratory management must have all the elements involved in competence, namely the ability, attitude and skills, which must be possessed and able to be applied by the Biology laboratory manager as educational staff in carrying out

laboratory management tasks. Yurnani (2010: 95) states that laboratory activities are activities that play a very important role in supporting the success of the learning process.

Laboratory management is not only the responsibility of laboratory personnel, but is the joint responsibility of all interested parties (stakeholders). Supervision in administration, inspection of materials and equipment in the laboratory must be considered. According to Terry (2009: 47) a planner must be able to describe (visualize) the proposed activity pattern clearly and clearly. Elseria (2016) states that currently the Biology laboratory in schools must be used optimally. This must be in harmony between interests, knowledge management and empowerment of human resources in the laboratory.

Laboratory management is an activity of planning, implementing, controlling as well as follow-up and improvement. Matters related to these activities include regulating and maintaining tools and materials, maintaining discipline in the laboratory, and laboratory safety, as well as using the laboratory optimally especially at SMA Negeri 3 Bandar Lampung.

Based on the discussion above, there are four research questions that guide this writing.

1. How is laboratory planning in improving school quality?
2. How is the implementation of the laboratory in improving school quality?
3. How is the control of laboratory activities in improving school quality?
4. What is the follow-up and laboratory improvement in improving school quality?

## II. LITERATURE REVIEW

This paper assumes that one of the supporting activities for learning is the management of facilities and infrastructure. According to Suharsimi (1979) facility management is a process that includes planning, procurement, use, regulation, personnel, and financing of learning tools or materials that can facilitate the implementation of teaching and learning activities.

One of the good laboratory standards is to have:

1. Main Room, this room functions for research activities, theory testing, practicum, or

- experimentation. This room can also be used as a place for practice and theory teaching.
2. Supporting Room, this room functions as a place for research activities if needed at any time, or if at any time the main room is full of participants.
  3. Teacher Room, This room is devoted to supervisors for research activity participants, experts, science teachers, and laboratory managers
  4. Laboratory Room, this room is occupied by field officers such as laboratory coordinators. However, other managers can also occupy this room.

According to Wahyuningrum (2000: 6), facility management is a process of activities that are planned, organized, directed and controlled for educational objects in an effective and efficient manner so that they are always ready to use in the learning process. One of the functions of learning biology is to train students to use scientific methods in solving the problems they face according to the Ministry of Education and Culture (1996: 1). The scientific method is a correspondence between statements and reality, between knowledge and experience, between theory and experiment.

Therefore, Biology laboratory management needs to use Deming's cycle mindset. Deming (1982) Deming cycle is a model of continuous improvement developed by W. Edward Deming which consists of 4 main components in sequence known as the Plan-Do-Check-Action cycle.

Planning in the laboratory includes data collection that will be developed with the laboratory manager. Initial management activities start from planning activities. According to Handoko (2011: 92), planning is the selection and setting of organizational goals and the determination of strategies, policies, projects, programs, procedures, methods, systems, budgets, and standards needed to achieve goals. This is in line with (Kurniawan, 2019) which explains planning as a process of preparing details and establishing good process standards that are suggested in order to achieve the process goals with optimal means.

Laboratory implementation which includes activities in the laboratory. Kurniawan (2018) implementation at this step the organization does what is planned at the planning stage and develops and tests several solutions. Managing a Biology laboratory certainly requires several management staff, with the principal as the main person in charge at the school level, both in terms of administration and technical education. Mulyadi (2009: 140) states that teachers must have physical, didactic and psychological knowledge about the equipment. The placement of the blackboard, for example, must pay attention to incoming rays and reflections, so that it does not dazzle the eyes of the students.

The control of the Biology laboratory work program illustrates that a series of activities that must be carried out include: provision and return of tools and materials, storage of tools and materials, regulations, laboratory work safety and security, utilization of practical tools, efficiency and

laboratory use processes. Koontz (2009: 41) states that control is the measurement and improvement of the work implementation of subordinates, so that plans that have been made to achieve goals can be realized.

Follow-up is an action that must be taken in view of the resulting standard, then it can be improved so that all can achieve their goals effectively and efficiently. Fitriani (2018) follow-up, namely making adjustments if deemed necessary. Adjustments relate to standardization of procedures in order to avoid the recurrence of the same problem. There are three important factors in the follow-up according to Isniah (2020), namely: consideration, description of the object of assessment, and responsible criteria. This aspect of the decision distinguishes evaluation as an activity and concept from other activities and concepts, such as measurement.

### III. METHOD

This study used a qualitative approach with case study design. According to Sugiyono (2010: 14), qualitative research can be interpreted as a research method based on the philosophy of positivism, used to research populations / samples, sampling techniques are carried out randomly, data collection through research instruments, data analysis is qualitative / statistical with the aim of testing the hypothesis that has been applied.

This research was conducted at SMA Negeri 3 Bandar Lampung. The determination of informants in this study was carried out by using purposive sampling technique so that the data obtained from the informants were in accordance with the needs and objectives of the study. Data collection techniques in this study were carried out in three ways, namely interviews, observation and documentation.

Data analysis in this study used the data analysis method according to Miles and Huberman (2014). In qualitative data analysis, there are four activities that occur simultaneously, namely: Data Collection, Data Reduction, Data Presentation, and Conclusion Drawing / Verification.

Checking the validity of the data is that every situation must be able to demonstrate the correct value, providing a basis for making the consistency of the procedure and the neutrality of the findings and decisions (Sugiyono, 2010: 329). Checking the validity of data can be done in several ways, following the division of four aspects of validity or quality, namely credibility, transferability, dependability, and confirmability.

### IV. RESULTS AND DISCUSSION

The results of this study are described in accordance with the research questions.

#### *1. How is laboratory planning in improving school quality?*

Biology laboratory planning at SMA Negeri 3 Bandar Lampung is included in the category of participatory planning because the planning process is manifested in deliberations, a draft plan is discussed and developed together with all managers. The laboratory manager in question is the principal,

laboratory coordinator, head of the biology laboratory, biology teacher, and students. This planning is also categorized as a bottom up planning because planning is made based on the needs, suggestions, desires, and problems faced.

Planning for the biology laboratory of SMA Negeri 3 Bandar Lampung, namely the principal giving direction to the manager of the biology laboratory, especially the head of the laboratory, the head of the biology laboratory makes a work program for the next year by looking at the availability of tools and materials, then collects data obtained from suggestions from laboratory managers and biology subject teacher, based on the teacher's experience during practicum, and based on the analysis of the inventory of tools and materials.

Biological laboratory planning in the school, namely, making a work program that will be carried out in a year by the head of the laboratory, this is supported by the opinion of Rumilah (2006: 84) who suggests that laboratory management planning is considered effective if there is a laboratory work program planning so that with laboratory planning which are made collectively will produce the desired goals, namely a quality biology laboratory and optimal practicum services.

### *2. How is the implementation of the laboratory in improving school quality?*

The implementation of the biology laboratory at SMA Negeri 3 Bandar Lampung includes functional implementation, namely in this type the distribution of rights and powers is carried out based on the functions carried out by the work unit, namely the biological laboratory work unit and tasks that require special expertise so that the personnel appointed and receive the authority to exercising power is delegated to people who have expertise in their respective fields of work. The authority delegated is limited to technical fields that require specific expertise, as stated by Winardi (2000) that an implementation is a work that is divided into components that can be handled and activities to achieve goals.

The structure of the biology laboratory organization in the school has a laboratory coordinator that houses the laboratories in the school so that the laboratory coordinator makes organizing the biology laboratory in this school more complete. The division of tasks for assistant teachers is carried out by the head of the laboratory based on the Regulation of the Minister of National Education No. 26 of 2008 concerning the standards for school / madrasah laboratory personnel, namely that a laboratory head must have managerial competence, namely dividing the duties of laboratory managers.

The responsibility of each laboratory manager is carried out in accordance with their respective duties, namely, school principal, representative for curriculum, representative for facilities and infrastructure, laboratory coordinator, head of biology laboratory and biology teacher.

### *3. How is the control of laboratory activities in improving school quality?*

Practical control activities in the laboratory are carried out by the head of the laboratory and the biology subject teacher, the laboratory head participates in monitoring all activities in the laboratory, the teacher provides explanations and provides directions to students before practicum about the steps that must be taken during the practicum, after completion practicum students are assigned to make a final report practicum in order to better understand the material that has been practiced.

The existence of a control function can be seen whether the implementation of activities is running properly or there is an error or deviation (Usman, 2013: 67). The learning process in this school is based on the 2013 curriculum, the 2013 curriculum learning process standard uses a scientific approach (scientific approach) with indicators of observing, asking, processing, presenting, concluding, and creating. This 2013 curriculum must balance hard skills and soft skills which include aspects of attitude, skills and knowledge.

### *4. What is the follow-up and laboratory improvement in improving school quality?*

The follow-up was carried out in the biology laboratory of SMA Negeri 3 Bandar Lampung, namely, the principal saw for himself the implementation of operational activities carried out by the laboratory manager, thus, the principal immediately obtained input that was very important to him in an effort to determine what corrective action was needed. he took. At least a principal will get the right impression about the things that are happening in the organization he leads. In fact, it is commonplace in organizations for a principal to make a surprise visit for direct observation, either with or without notifying the people to be observed in advance.

Apart from direct observation, monitoring for follow-up is also carried out with activity reports from the laboratory manager. Reports can be written but can also be oral reports. In order to meet the requirements the report should be as follows:

1. Reports are made in a predetermined format.
2. The report is prepared completely in the sense that everything expected to be reported is contained in the report.
3. The report is prepared in a language appropriate to the level of education, cognitive power and reasoning of the recipient of the report.
4. Reports are submitted on time.
5. Reports must be factual (Siagian, 2007: 141-142).

Therefore, with the follow-up supervision carried out by the principal of the laboratory will have a positive impact on laboratory development in the future and can make a quality biology laboratory.

## V. CONCLUSIONS AND SUGGESTIONS

## REFERENCES

## A. Conclusion

1. Laboratory planning which includes planning, collecting data to find obstacles and timing the development of biological laboratories in improving school quality.
2. Laboratory implementation which includes determining laboratory activities to create an organizational structure and determine who is responsible for the biology laboratory in improving school quality.
3. Controlling activities are carried out by arranging practicum activity schedules, practicum service activities, learning process with practicum, and procurement of practicum tools and materials in improving school quality.
4. Laboratory follow-up and improvement includes follow-up supervision and laboratory implementation in improving school quality.

## B. Suggestions

## 1. Principal

In the future, the principal is expected to be better able to plan and develop biology laboratories as well as possible in terms of infrastructure in improving the quality of schools, as well as collaborating with other schools.

## 2. Head of Laboratory

The head of the laboratory should be more assertive in the division of tasks related to laboratory activities and there should be more suggestions so that the biological laboratory can be effective and efficient.

## 3. For Teachers

Teachers are expected to further improve the learning process in the laboratory and must be better at managing practicum time.

## 4. For Further Researchers

The next researcher can use different objects, expand the population, or use a different research approach so that they can find new discoveries.

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