

UTILIZATION OF SCIENCE LABORATORIES IN JUNIOR HIGH SCHOOLS IN BULAKAMBA DISTRICT BREBES REGENCY

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Abstract

The presence of a Science Laboratory is highly important to support the implementation of education in order to achieve educational objectives. The research aims to determine the utilization of Science Laboratories in junior high schools (SMP/MTs) in Bulakamba Sub-District, Brebes Regency. The research employs a qualitative approach with a phenomenological research design, combining descriptive exploratory methods and steps. The samples in this research consist of 1 Public Junior High School, 1 Independent Junior High School, and 1 Islamic Junior High School (MTs) in Bulakamba Sub-District, Brebes Regency. The research findings regarding the utilization of Science Laboratories reveal several aspects; (1) Availability of Science Laboratory equipment in SMP/MTs in Bulakamba Sub-District, Brebes Regency, falls under the complete category with a score of 69.33%, (2) The design of Science Laboratories in SMP/MTs in Bulakamba Sub-District, Brebes Regency, falls under the highly complete category with a score of 96.67%, (3) Administration of Science Laboratories in SMP/MTs in Bulakamba Sub-District, Brebes Regency, scores 79.27%, categorized as good, (4) Management of practicum implementation in SMP/MTs in Bulakamba Sub-District, Brebes Regency, falls under the highly proficient category with a score of 89.08%. The utilization of Science Laboratories in SMP/MTs in Bulakamba Sub-District, Brebes Regency, is already good; however, some obstacles are also identified in the utilization of Science Laboratories. These include the absence of laboratory assistants, inadequate facilities, and the integration of practical sessions with theory classes.

Keywords: Science Laboratory; utilization of the Science Laboratory

1 INTRODUCTION

The availability of maximum infrastructure in learning, able to optimize the interests and talents of students, can support the learning process and be able to increase teacher creativity and innovation in learning. One indicator of the quality of educational institutions can be seen from the availability of facilities and means of supporting learning [1]. Science is one of the subjects that often utilizes school infrastructure, science teaches how students have science skills, in understanding the phenomena that occur. Science skills in science learning can be achieved in practicum activities carried out in the laboratory. Science skills in learning cannot be separated from practicum activities carried out in the laboratory [2]. Khuzaemah & Yulia Gloria (2016), revealed that the existence of a science laboratory to support the implementation of learning is very important for achieving educational goals, because the science laboratory is a means to develop and apply skills in learning through laboratory activities [3]. Facts in the field After observations were made in several junior high schools/islamic junior high schools in Bulakamba District, Brebes Regency, there are still many junior high schools/islamic junior high schools that do not have laboratories. Some junior high schools/islamic junior high schools that have laboratories, the laboratory conditions are not up to standard. In addition to the state of science laboratory facilities and infrastructure, the utilization of science laboratories is also an important thing to study, because the results of field observations found that the obstacles encountered by science teachers in utilizing science laboratories are often found, such as the absence of laboratory assistants, the lack of availability of practicum tools and materials, the imbalance between the number of study groups and the number of laboratory rooms, up to the lack of science class hours.

2 METHODOLOGY

The approach used in this research is a qualitative approach, to examine holistically the extent to which the utilization of science laboratories in junior high schools/islamic junior high schools in Bulakamba District Brebes Regency with the standards contained in the regulation of the minister of national education number 24 of 2007 and the guidelines for the management and utilization of

science laboratories by the Ministry of Education and Culture in 2017. While the research design uses phenomenological research design to describe the similarities of all respondents as they experience the phenomena, focusing more on participants' specific statements and experiences rather than abstracting from the researcher's statements [4]. The exploratory descriptive design aims to provide an overview of the state of the phenomenon and the results of the research can be the basis for further research. Data collection was carried out in several ways including; (1) direct observation in three junior high school/islamic junior high school laboratories related to the availability of science laboratory equipment and science laboratory design based on the regulation of the minister of national education number 24 of 2007, (2) questionnaires to collect data using forms filled in directly by informants to narrow down the answers to questions [5]. questionnaires regarding the availability of science laboratory equipment and science laboratory design and utilization of science laboratories, questionnaires were given to science teachers, science laboratory managers and 8th grade students regarding the extent of science laboratory utilization, (3) documentation studies as supporting data used in the research, in the form of laboratory inventory books. The data analysis technique used is interactive data analysis developed by Miles and Huberman, including: (1) Data reduction, that is, the process of selecting focus, simplifying, grouping and collecting information in various groups based on the focus of known problems (2) presenting data by displaying grouped information based on what is wanted to know, using narratives by adding tables and images as data support (3) Conclusions and verification by reviewing the data needed to double-check so that conclusions are obtained, Testing the validity of the data in this study using the triangulation method of sources and data collection techniques [6].

3 RESULTS

Data related to the utilization of science laboratories were obtained from direct observations in three junior high schools/islamic junior high schools in Bulakamba District, Brebes Regency and filling out questionnaires given to 6 science teachers, 3 laboratory managers and 9 8th grade students. Discussion of how the utilization of science laboratories can be seen from several aspects, according to Imastuti, Wiyanto (2016), in the utilization of science laboratories can be seen from several aspects including: (1) Availability of science laboratory equipment, (2) Science laboratory design, (3) Science laboratory administration and (4) Management of practicum implementation [7].

3.1 Availability of science laboratory equipment

The availability of science laboratory tools in junior high school/islamic junior high school in Bulakamba Sub-district, Brebes Regency, received a score of 69.33% which was categorized as complete.

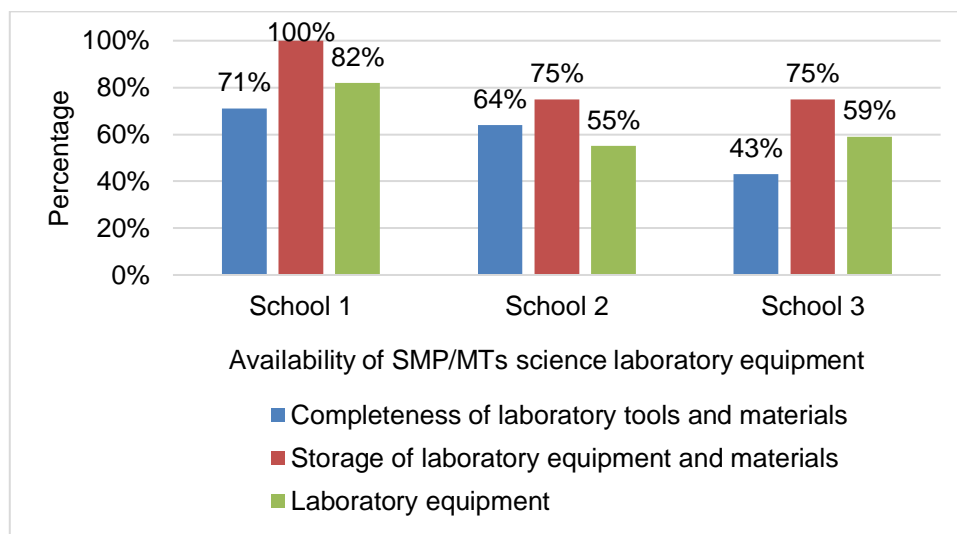


Figure 1 Aspect Availability of science laboratory equipment SMP/MTs

The data in Figure 1 obtained from observations in three junior high schools in Bulakamba Subdistrict, Brebes Regency, show differences in the condition of science laboratory facilities in several aspects, namely; (1) The aspect of completeness of laboratory equipment and materials in junior high schools

in Bulakamba Subdistrict, Brebes Regency, gets an average score of 59.33% with a complete category, but when examined further, it was found that the score of the availability of science laboratory equipment in the aspect of completeness of science laboratory equipment and materials in three junior high schools in different conditions. This is based on the findings in the field that some of the science laboratory equipment in the three junior high schools/islamic junior high school are not in accordance with the regulations of the Ministry of National Education regulation number 24 of 2007, both in quantity and quality. The same results were also found in the research of Noorjanah et al. (2023) that the equipment in the science laboratory of SMPN 02 Karangdowo is included in the good enough category, but there are laboratory equipment that does not fit the standard [8].

(2) The storage aspect of laboratory equipment and materials in SMP / MTs Bulakamba District, Brebes Regency received a score of 83.33% which was categorized as very complete. (3) The aspect of laboratory equipment includes several indicators, namely, science laboratory furniture, science laboratory educational media and other science laboratory equipment indicators. Based on the results of observations of aspects of science laboratory equipment in SMP/MTs Bulakamba District, Brebes Regency, getting a score of 65.33% in the complete category, with the findings in several SMP / MTs laboratories in Bulakamba District, Brebes Regency, not having a fire extinguisher, first aid equipment, wall clock, and the number of electrical sockets that are not in accordance with the standard, research conducted by Rahman (2017), found that the equipment indicators at SMPN 4 Sumenep cannot be said to meet ideal laboratory standards for several reasons. One of them is the problem with inappropriate electrical sockets. In addition, first aid equipment should be provided in the science laboratory [9].

3.2 Science Laboratory Design

The results of the research on the design of the science laboratory only refer to aspects of the science laboratory infrastructure, that is, the location and space of the science laboratory.

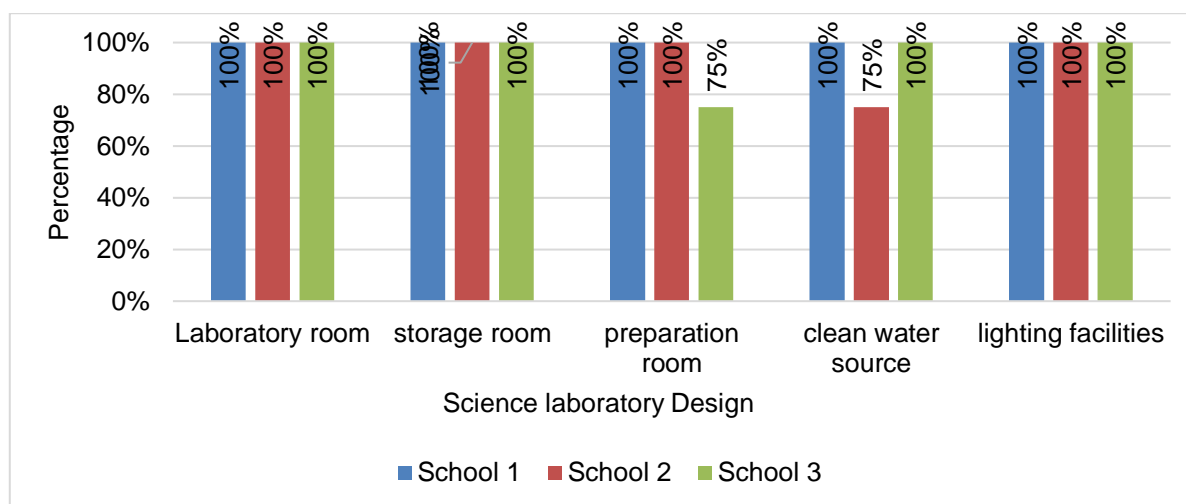


Figure 2 Aspect Science Laboratory Design

Based on Figure 2, the design of science laboratories refers to data on science laboratory infrastructure in junior high schools/islamic junior high schools Bulakamba District Brebes Regency, the final average value is 96.67% which is categorized as very complete, the data obtained by observation in three junior high schools/islamic junior high schools Bulakamba District Brebes Regency, about science laboratory infrastructure shows differences in the condition of science laboratory infrastructure in several indicators.

Based on the results of observations supported by questionnaire sheets and documentation, the area of laboratory space and storage space in three junior high schools/ islamic junior high schools in Bulakamba District, Brebes Regency is in accordance with the standards set in the regulation of the Ministry of National Education number 24 of 2007, so that the indicator of the area of science laboratory room and storage room in junior high schools/ islamic junior high schools in Bulakamba District, Brebes Regency, gets a percentage score of 100%, which is categorized as very complete. Storage room is one of the important indicators in the aspect of location and laboratory space, where the storage room is separate from the practicum room so that teachers and students are easy to find practicum tools and materials, besides that, it is also to avoid major accidents such as broken or

damaged tools, and fires of laboratory materials in student practice activities in the laboratory room [10].

In the preparation room indicator, it was found that one of the three junior high school science laboratories / MTs in Bulakamba sub-district, Brebes Regency did not have a separate preparation room, from the explanation of the head of the science laboratory coordinator at the school, they prepared practicum tools and materials that would be carried out experiments, prepared in the side of the science laboratory room. This finding is also in line with Uluputty's research (2021) that in SMP N 14 Ambon does not have a preparation room, so in order to prepare practicum tools and materials, it is carried out in the side of the practicum room. Based on these findings, the indicator of the preparation room of SMP/MTs in Bulakamba District, Brebes Regency, received a percentage score of 91.67% which was categorized as very complete [11].

The results of observations carried out in the SMP/MTs of Bulakamba District, Brebes Regency, found that one of the SMP/MTs laboratories has a clean water source but the water tap in the sink in the laboratory room is not functioning. Based on this, the indicator of clean water sources in the science laboratory of SMP / MTs in Bulakamba District, Brebes Regency, gets a percentage score of 91.67% which is categorized as very complete, although the percentage obtained is good, but considering the importance of the availability of clean water sources, it is necessary to communicate regarding the damage to the principal and school committee about the infrastructure problems [12].

Lighting Facilities in the Science Laboratory of SMP/MTs Bulakamba District, Brebes Regency, are quite good in accordance with the provisions in the regulation of the Ministry of National Education number 24 of 2007, that the science laboratory room is equipped with adequate lighting facilities, allowing for reading books and observing experimental objects properly [9]. The lighting facilities available in the laboratory room of SMP/MTs Bulakamba District, Brebes Regency, are in the form of windows, ventilation and lights that function properly.

3.3 Science Laboratory Administration

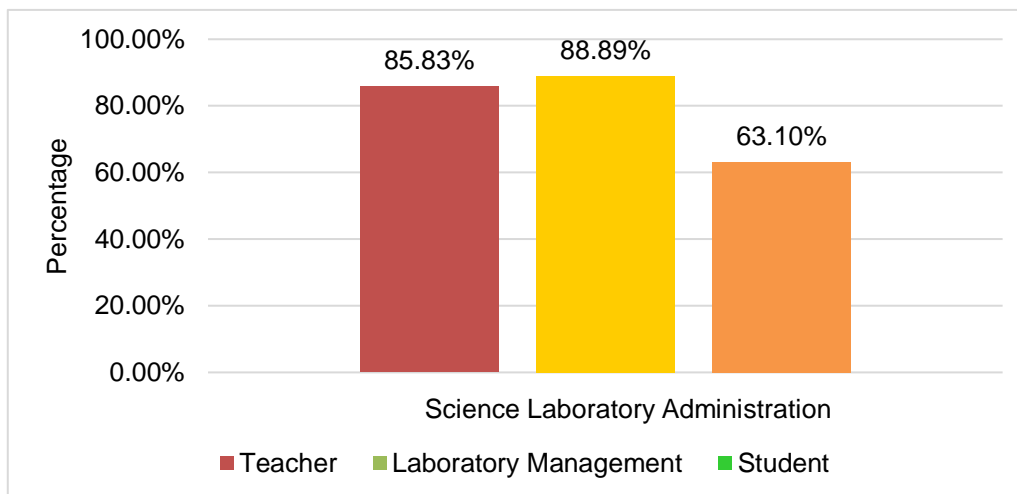


Figure 3 Aspect Science Laboratory Administration

The average value of the utilization of science laboratories in the aspect of science laboratory administration gets a score that is sufficient, which is 79.27% in the good category. There are several indicators that are not fulfilled in this aspect, so that the utilization of science laboratories is not optimal, one of which is the absence of laboratory assistants in the three junior high schools/islamic junior high schools in Bulakamba District, Brebes Regency which are the samples in this research, this is known from the direct statement of the head of the laboratory that one of the obstacles to the utilization of science laboratories is the absence of laboratory assistants. As a consequence of the absence of a laboratory assistant in the science laboratory, some laboratory administration is not fulfilled, such as the results of observations made, namely the absence of an inventory book of tools and materials, a diary of laboratory activities, a program of practicum activities and others, as for the implementation of science laboratory administration carried out by science teachers who double as managers of science laboratories, this situation results in the administration of science laboratories not optimal.

Another obstacle that exists due to the absence of laboratory assistants was also conveyed by one of the heads of science laboratories in junior high schools/islamic junior high schools who sampled this research, that the absence of laboratory assistants also resulted in inefficient allocation of practicum time, because the allocation of practicum time was cut to prepare practicum tools and materials first, This was also stated by Imastuti, Wiyanto (2016), in a study conducted at SMA / MA in Salatiga City, it was revealed that there were several aspects that did not meet the requirements so that the laboratory could not be used optimally [7]. This condition is caused by several factors, such as the lack of qualifications or competence of laboratory assistants with the duties and functions of the laboratory. In addition, ineffective laboratory management is also a cause of this problem. The existence of laboratory assistants who are in accordance with their competence is very influential on the completeness of laboratory administration and the smooth learning process in it.

Based on the constraints of science laboratory administration caused by the absence of laboratory assistants, the existence of laboratory assistants is very important to optimize the use of science laboratories, especially in the administrative aspects of science laboratories, because the presence of laboratory assistants in science laboratories helps reactivate the laboratory. The laboratory assistant is responsible for laboratory administration such as inventory of tools / materials, requests for tools and materials, schedules and programs of laboratory activities, as well as the preparation and arrangement of tools and materials. With the support of competent laboratory assistants, laboratories can function optimally in supporting learning and developing student competencies [12].

3.4 Management of Practicum Implementation

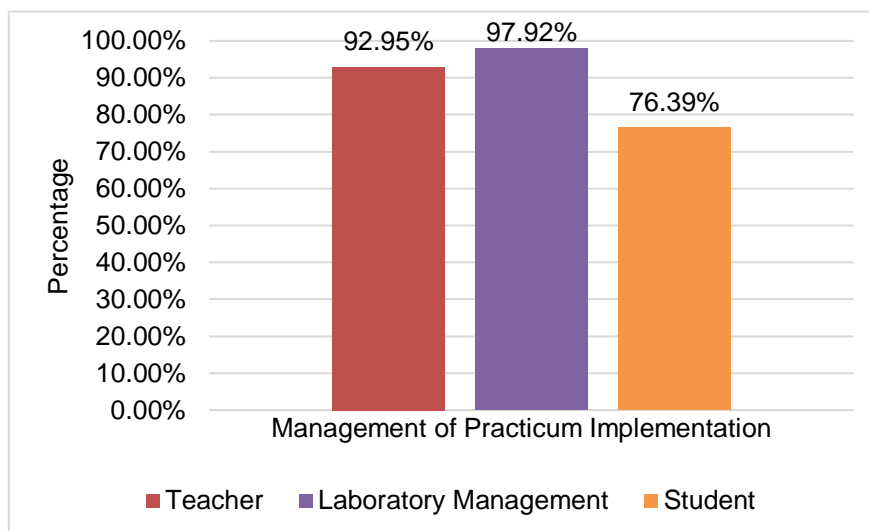


Figure 4 Aspect of Management practicum Implementation

Different from the previous aspect of science laboratory administration, the management aspect of practicum implementation gets a higher score of 89.08% which is included in the very good category. This is in accordance with the research of Imastuti, Wiyanto (2016), the management of physics practicum implementation in senior high schools/islamic senior high schools in Salatiga City has a higher percentage, the research data shows that the management of physics practicum in SMA/MA in the city shows positive results [7]. The average value obtained from the utilization of science laboratories in the aspect of practicum management is quite high, but the value is not evenly distributed in each group of respondents, apart from the factor of the absence of laboratory assistants as an important part of the management of practicum implementation, other things are also an obstacle in the utilization of science laboratories in SMP/MTs Bulakamba District, Brebes Regency.

Other obstacles that exist in the management aspect of practicum implementation include; (1) not always practicum is carried out in the laboratory room but several times practicum is carried out in the classroom so that this creates a lack of experience for students, and tends to be boring, which in the end results in student responses in determining the extent to which the utilization of science laboratories is quite low. One of the science learning methods that can achieve the results of scientific concepts and scientific process components is to carry out learning through practicum in the laboratory [13].

(2) the availability of laboratory equipment and infrastructure that is less representative is an obstacle faced by science teachers when going to carry out practicum in the laboratory, according to the results of observations made that there are several laboratory equipment that are broken, damaged, and not functioning properly. The damage to laboratory equipment and the lack of availability of laboratory equipment is due to the absence of laboratory staff to maintain laboratory equipment, while another factor is the absence of procurement and replacement of damaged laboratory equipment periodically and continuously. Based on the narrative of each head of the science laboratory coordinator at SMP/MTs Bulakamba District, Brebes Regency, that the procurement of existing laboratory equipment is now obtained from the grant assistance for science laboratory facilities and infrastructure which was budgeted more than ten years ago, and there is no independent procurement from each school to replace damaged science laboratory equipment, there is only one sample school that received grant assistance for science laboratory infrastructure twice.

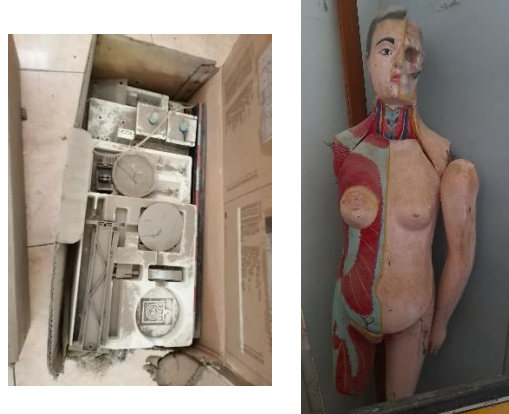


Figure 5 science laboratory equipment in a broken state

(3) Practicum hours that become one with theory hours are additional obstacles found in the management of practicum implementation, this is exacerbated by the absence of special laboratory staff to prepare practicum equipment and materials, this has an impact on not all science material being practiced in the laboratory, there are only a few science materials that are often practiced, such as; growth and development, biotechnology, physical and chemical changes, solar system, heat and temperature, vibrations and waves, static electricity and dynamic electricity. Obstacles related to practicum time were also found in Kustiana's research (2019) that in the learning curriculum there was no time provided for the practicum itself, which resulted in the practicum not being held [14].

4 CONCLUSIONS

The utilization of science laboratories in junior high schools/islamic junior high schools in Bulakamba District, Brebes Regency is quite good, this can be seen from the final average score obtained from several aspects, namely; (1) the aspect of the availability of science laboratory equipment of 69.33% in the complete category, (2) the aspect of science laboratory design of 96.67% which is categorized as very complete, (3) the aspect of science laboratory administration of 79.27 and (4) the management aspect of practicum implementation of 89.08%. In the utilization of junior high school science laboratories / MTs can not be separated from the obstacles that arise, such as the absence of laboratory staff, the completeness of inadequate infrastructure and practicum hours that blend with class hours (theory).

The utilization of science laboratories can be optimal by paying attention to the supporting aspects of the utilization of science laboratories, so this is a joint task of school leaders, science teachers, laboratory managers, and related agencies in completing the shortcomings in these supporting aspects. Follow-up research on the utilization of science laboratories, needs to be developed more specifically and with other methods to obtain more detailed information.

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