

ANALYSIS OF SCIENCE LABORATORY STANDARDIZATION IN PRACTICE ACTIVITIES AT UNIVERSITAS ISLAM NEGERI FATMAWATI SUKARNO BENGKULU

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ABSTRACT

This research is intended to assess the extent of laboratory standardization, the implementation of these practices, and the contribution of laboratory equipment and infrastructure to facilitating practicum activities at UINFAS BENGKULU. In this study, two different types of data collection methods were used: primary data, which was obtained directly from research participants through the distribution of questionnaires, and secondary data which involved interviews which were used to gather information through analysis. This study shows that the facilities and infrastructure of the UINFAS BENGKULU science laboratory have not met the standard of 100% of its carrying capacity.

1. INTRODUCTION

Science education should place a strong emphasis on students' hands-on experience as well as theory, real-world concepts, facts, and principles. If science teaching is linked to environmental issues, it will be more attractive to students. When studying science, students frequently run into learning obstacles, especially when they are working with complex topics that call for a deeper comprehension. Direct experience should be emphasized in teaching science to help students become proficient in investigating and understanding nature scientifically (Ismiyanti et al., 2021). Students can benefit from doing this by understanding the natural world more deeply.

Practicum activities are a good place to carry out activities to provide direct experience to students. Practicum is an important component in the science learning process because it encourages students to be active, inventive, and curious (Harahap et al., 2022). Practicum laboratory activities are one of the things that greatly determine the effectiveness of the science teaching and learning process. Students will be able to study science through direct observation of the signs and processes of science through practicum. They will also be able to develop their scientific attitude, develop their scientific thinking skills, and be able to identify and solve new problems using scientific methods (Nasution & Hasairin, 2016).

The laboratory is a place to practice or study using special infrastructure and tools and is equipped with adequate and complete laboratory infrastructure (Silvia & Aryanti, 2022). Because it has a significant impact on students' ability to understand what is presented vocally in class, the science laboratory is a very important tool in the teaching and learning process (Anggereni et al, 2021). When students are able to carry out independent practical investigations that may be related to their unique learning, science laboratories are used more successfully (Anggereni et al., 2021). A proper laboratory needs to include standard and special facilities that can facilitate the use of the laboratory (Harling & Martono, 2021). According to (Rodrigo Garcia Motta, Angélica Link, Viviane Aparecida Bussolaro et al, 2021), a scientific laboratory room is a place for practical learning that requires facilities.

A laboratory needs to be supported by facilities and infrastructure that are in accordance with the needs and standards for the type of laboratory (Hayati & Sumarsih, 2020). The components of scientific laboratory facilities in high schools listed in the Minister of National Education of the Republic of Indonesia Number 24 of 2007 are laboratory buildings/rooms, furniture, educational equipment, experimental tools and materials, educational media, consumables, and other equipment.

According to PERMENDIKNAS no. 24 of 2007 which regulates the standardization of scientific laboratories, the minimum size of a science laboratory can accommodate one group (one class) with around 20 students. The minimum science lab has areas for practice, storage, and preparation. Facilities that must be available include clean water and a room with sufficient lighting to read and observe experimental objects (Rahman & Sumenep, 2017). Furniture, educational tools, educational tools, and other equipment such as electrical installations, first aid kits, fire extinguishers, trash cans, and wall clocks are some of the facilities regulated in Permendiknas 24/2007.

This study examines how the state of the science laboratory infrastructure supports an efficient and minimum standard science learning process. The purpose of this study was to determine the conditions of the science laboratory in accordance with the standardization of Permendiknas No. 24 of 2007 and find out about student satisfaction with science laboratory facilities and infrastructure. In addition, the government and universities must strive to build and complete laboratory facilities and infrastructure.

2. METHODOLOGY

The collection of data and information needed in this study was carried out at UINFAS BENGKULU. The research was conducted on November 28, 2022. There were two types of data collection methods used in this research, such as primary data obtained directly from research subjects through the distribution of questionnaires that have been given and secondary data in the form of information collected through analysis in the form of interviews. Primary data collection was carried out using a questionnaire instrument. What is meant by a questionnaire instrument in the form of questions, answers are provided by using certain categories or choices that are appropriate to the topic of the instrument of the research subject.

The data that has been collected is arranged in the form of scores on an interval scale. Questionnaires were used to obtain results from the level of student satisfaction with laboratory facilities and infrastructure, interviews are used to determine laboratory standardization.

3. RESULT AND DISCUSSION

Observation results are adjusted or equated with the standards set by the government, in law No. 24 of 2007 concerning minimum standards that must be owned by a science laboratory. the results of the interviews will be presented or described in accordance with the results of the interviews that have been conducted and the results of the questionnaires that have been distributed to 20 respondents.

1. Science laboratory standardization against Permendiknas standards.

From the results of the interviews that were conducted regarding the science laboratory facilities and infrastructure, there was an index that became the center of the question which is the condition of the science laboratory infrastructure was adequate but not yet included in the standard category.

Table 1. Results of Interviews and Observations on Laboratory Room Facilities I

Type	Standard ratio	Real ratio	Ket
Lab room	The science laboratory room can be filled with at least one study group, the ratio of drinking lab space is 2.4m ² /student	The science laboratory room can be filled with a study group with a capacity of ± 20 students.	Adequate
Prep room	The science laboratory room is at least equipped with a preparation room that has good electrical installations and air ventilation	The science laboratory room is not equipped with a preparation room, which has poor electrical installations and air ventilation	Inadequate
Warehouse	The science laboratory room is at least equipped with a storage room that has electrical installations, good air ventilation and mobile facilities such as tool cabinets, material cupboards.	The science laboratory does not have a special room or warehouse for storage, but has tool cabinets and material cabinets that are still in good condition and can be locked.	Inadequate
Lighting	The science laboratory room is equipped with sufficient and adequate lighting such as cable networks, fuses, lights, switches and sockets,	The lighting for the laboratory room is good, there is 1 socket in the laboratory room.	Adequate
Clean water is available	There is a sink with clean running water	Do not have a place for washing hands or a sink, usually students will bring their own water and tissues to wash their hands and clean equipment.	Inadequate

In the science laboratory there is a main room, which is the practicum room, storage room, and preparation room. The preparation room is used to prepare practicums, test equipment, or conduct research(Cahyani, 2022).From the results of the interview, it can be explained that the UINFAS Bengkulu Science laboratory building cannot be said to be standard because this Science laboratory room is a classroom that is made into a laboratory so that it is still integrated with the SAINTEK building which is still attached to the classroom. the size of the science laboratory is also inadequate because there is no preparation room available, no storage warehouse and no hand washing area or sink. In the science laboratory room also still use a fan.

The practicum facilities and materials at the UINFAS Bengkulu Science laboratory were not sufficient, especially the physics practicum facilities and materials, only tools and materials for biology and chemistry practicum were available. The practicum tool and materials room is equipped with several tool cabinets and practicum materials, but the UINFAS Bengkulu Science laboratory still lacks tool and material cabinets. Storage of practicum tools and materials in a cupboard is also based on the types and materials placed in different cupboards. Practicum materials must be stored by class not by alphabet on different shelves or cupboards to avoid accidents such as explosive materials, burning materials and so on.(Rivo Alfarizi Kurniawan, 2021). The UINFAS Bengkulu science laboratory practicum room is equipped with a practicum table, blackboard, and pictures/charts. Besides that, the practicum room is also equipped with adequate light in the form of lights and windows as well as work safety standards in the form of a fire extinguisher placed in the room.

2. The results of the questionnaire on the level of student satisfaction with laboratory facilities and infrastructure

Information :

A: unsatisfactory

B : unsatisfactory

C : quite satisfactory

D : satisfactory

E : very satisfying

Table 2. Questionnaire on the level of student satisfaction with facilities and infrastructure

No	Question	A	B	C	D	E
1	Equipment availability	-	4	9	6	1
2	Availability of materials	-	10	8	2	-
3	The ability of lecturers to provide explanations	1	3	7	9	-
4	Obedience to the rules	-	5	11	4	1
5	Arrangement and arrangement of equipment and practicum materials	1	3	12	5	-
6	Facilities and infrastructure	1	3	10	6	-
7	Cleanliness	-	1	5	14	-

8	Security	-	1	3	16	-
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Based on the results of the questionnaire data analysis from student answers, the data shows that the condition of the infrastructure is unsatisfactory. In fact, the conditions that appear are the preparation room and storage room together with the practicum room. Even the science laboratory does not have tools and materials for physics practicum, only available tools and materials for chemistry and biology practicum, some tools and practicum materials in the UINFAS BENGKULU science laboratory do not exist and students must prepare practicum materials that are not available in the laboratory. There is no place to wash hands/sinks in the science laboratory room, so every student doing practical work must bring their own water and tissues.

4. CONCLUSION

From the results of research related to standardization of science laboratories in practicum activities at UINFAS Bengkulu, it can be concluded that the standard of facilities and infrastructure at the UINFAS Bengkulu science laboratory does not meet the standards of facilities and infrastructure specified in Permendiknas No. 24 of 2007, because there are still many deficiencies in facilities and infrastructure, such as the laboratory room uniting with the classroom in the laboratory room there is no preparation room available, there is no storage warehouse, there is no place to wash hands/sink and the laboratory room still uses a fan. In the UINFAS Bengkulu Science laboratory room, there are only 5 cabinets so that the Science laboratory still lacks cupboards for storing tools and materials, but practicum tools and materials have been arranged according to type and class.

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