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Preliminary Study: Study of Supporting Facilities for Natural Science Mini Project Practicum Models of Junior High Schools in Mataram

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Abstract
This study aims to describe the supporting facilities for the Natural Science Mini Project Practicum (PIMPA) model of learning from the availability of tools and chemicals as well as books or literature available in SMP throughout Mataram City. This research was conducted in three schools spread outside the urban areas of Mataram City, especially those located close to the tourism area of Mataram City, namely: SMPN 11 Mataram, SMPN 17 Mataram, and SMPN 21 Mataram. The research subjects were laboratories and libraries, and the research objects were laboratory support facilities. The form of activity carried out is the recording of documents (inventory) of laboratory equipment and their use in science practicum activities. The data from this study were analyzed descriptively qualitatively. The results of this study indicate that the laboratory carrying capacity in the PIMPA model is the availability of laboratory equipment for science practicum activities at SMPN 11 Mataram is 77.27% (adequate); SMPN 17 Mataram available 77.27% (adequate); and SMPN 21 Mataram available 72.72% (adequate).

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INTRODUCTION

Science learning is systematic knowledge obtained from an observation, research, and trials that lead to determining the basic nature or principle of something being investigated, studied, and so on (Wong.S.L & Hodson.D, 2009) and (Setiawati & Ekayanti, 2021). Science learning can also be interpreted as an intellectual and practical activity which includes a systematic study of the structure and behavior of the universe through scientific work (Cantona & Sudarma, 2020). Natural sciences (IPA) play a very big role in the lives of students so that they can protect themselves, others and nature, seek hidden potentials from nature, and help humans make decisions in solving problems.

At the junior high school (SMP) level, science learning plays a role in facilitating students to become independent individuals and able to collaborate with others (Faiz, Pratama, & Kurniawaty, 2022). The ability to practice learning in the community and the surrounding environment will be a very strategic media to shape innovation in each student (Lin & Chiu, 2020). In addition, students are able to explore the potential that Indonesia has, identify problems that exist around it in a global perspective. In order to be able to do this, students who study science are expected to achieve conceptual understanding and process skills.

IPA is formed based on factual events, then becomes a concept (Nisa, 2017). In applying the concept, it is applied procedurally and reaches metacognitive. The concept of Science Education as an education that explains natural phenomena formed from scientific processes, causes every individual who studies science to be able to process scientifically and produce scientific products. The situation related to facts becomes a concept and then elaborated in detail into procedures and metacognitive cycles produce new facts and concepts and procedures in accordance with the development of needs and knowledge itself. Science learning essentially includes three components, namely scientific attitudes, scientific processes, and scientific products (Anggareni, Ristiati, & Widiyanti, 2013).

Conceptual understanding is described as students' ability to think scientifically by having a complete understanding of science. The ability to think will have a progressive impact on the development of science if one has an understanding of a particular scientific field (Fatimah, 2017). Understanding the next concept is having critical reasoning skills in understanding science content. Furthermore, understanding of science concepts can be associated with higher order thinking skills (Ratnasari, Haris, & Azis, 2021).

Process skills are described as a process of diagnosing situations, formulating problems, criticizing an experiment and finding differences from existing alternatives, seeking opinions based on incomplete information, designing investigations, finding information, creating models, debating colleagues. using facts, as well as forming a coherent argument (Solé-Llussà, Aguilar, & Ibáñez, 2022)..

Some experts also describe that process skills are students' abilities to carry out activities of observing, questioning and predicting, planning and conducting investigations, processing, analyzing data and information, evaluating and reflecting and communicating results. One of the efforts to achieve conceptual understanding and process skills is through practicum activities (Dewi.R, Suastra, & Pujani, 2018)and (Idris, Talib, & Raza, 2022).

Science practicum can be interpreted as a series of activities that allow students to apply skills or practice something from the knowledge they already have or learn. Learning with the practicum model is the presentation of lessons by conducting experiments so that students can experience, do and prove the knowledge they have obtained for themselves (Suryaningsih, 2017). Practicum activities provide a science learning experience that can be felt directly. So that practicum activities have an important role in realizing motivation and interest in learning as well as developing students' science process skills in the science learning process which will ultimately lead to student learning outcomes (Ardiansyah, Sarjan, & Hakim, 2022). Science practicum will train students' skills both starting from the skills of observing a problem to skills in communicating the results of their findings (Hidayati & Candra, 2020).

So that the practice carried out by students is more directed and in accordance with the goals to be achieved, one of the activities that makes students experience themselves, discovers, and communicates the results obtained can be through practicum activities. The implementation of practicum activities in educational units still faces many obstacles. Problems that are often faced and experienced by teachers in carrying out practicum activities such as: lack of practicum equipment, lack of teacher knowledge and skills in carrying out practicum activities (Anggraini, 2016), practicum activities or laboratory activities are practically rarely carried out, practicum takes up a lot of time and energy (Maknun, Surtikanti, & Subahar, 2012).

Practicum activities carried out in the laboratory and outside the laboratory (nature) will produce students' skills abilities. Students will be more skilled in various things in accordance with future demands. Science learning is carried out so that students can realize skills that reflect the correct behavior of scientists in designing experimental activities and solving problems in every field of science (Yuliati, 2016).

The implementation of science practicum in its development process, carried out various steps of science practicum that lead to certain goals. Currently, the Natural Science Mini Project Practicum Model is being developed as a form of development of the mini project practicum model that has been developed by previous researchers. There is a mini project practicum model generally has 8 (eight) stages namely : introduction , training , orientation problem , design , present proposals , implementation , reporting and evaluation (Hakim.A, Liliasari, Kodarohman.A, & Maolana.SY, 2016).

In line with efforts to develop practicum models at a lower level (junior high school) as well as the use of environmental conditions and everyday life developed form appropriate mini project practicum with condition environment natural life everyday and possible done investigation in a manner natural. Product results of mini projects can felt by society with various proof For prove truth data information obtained. The resulting impact from various activity with environment is presence attitude scientific one _ concern to environment

Examples of mini project practicum activities in the early stages of practicum participants are divided into groups consisting of 3 participants, each group identifies 3 plants. The material used to carry out the mini project is related to the theory in the course, by taking different materials from the material used during the practicum (Nurmilawati & Rahmawati, 2018). In the first stage, namely the introduction of practicum activities in the form of a pre-test, then the teacher gives an explanation about the Mini-Project laboratory that will be carried out and the research schedule (Trisusilosakti & Aisyah, 2020). The second activity forms groups.

From this preliminary activity because there is already an explanation of the schedule, students have not been encouraged to think individually about the sample or object to be practiced. The third activity is problem orientation. Students are given problems by the teacher to solve in mini project activities. These three stages can be adapted to project-based learning and scientific learning by involving 21st century skills such as observing samples, exploring the usefulness of samples through the ability to ask questions of the public and find out by utilizing information technology. Initial understanding through observing and asking activities will result in advanced abilities in students, namely the ability to ask questions for research.

The next stage of the 8 (eight) steps of the mini project is designing proposals, presenting proposals and implementing proposals. These three stages are very suitable in forming 21st century abilities or skills because they are able to train students in designing, communicating and implementing proposal plans that have been prepared.

The next stage is reporting and evaluation. Skills developed are the ability to communicate and self-reflection. Of course, these stages are almost in line, meaning that what will be presented is in the form of a report. At the evaluation stage contains activities to draw conclusions and final assessment.

The science practicum in the science laboratory does not only require the use of modern laboratory equipment, but the science practicum can also use simple tools (Pertiwi, 2019). These laboratory tools are one of the supporting facilities in the implementation of science practicum. In addition to laboratory equipment, supporting literature is also needed such as reference books, practicum implementation manuals, and student worksheets available in the library. Other books are in the form of supporting general popular scientific writings.

In this regard, a study was conducted to observe and inventory the availability of science practicum tools and reference books available in schools at the junior high school level. The results of these observations and inventories will provide recommendations regarding the readiness of supporting facilities for the implementation of the natural science mini project practicum model. The results of these observations and inventories became the research objective, namely to describe the supporting facilities for the implementation of the natural science mini project practicum model.

METHOD

The approach used in this study is a qualitative approach. The type of research used is case study research. According to (Creswell, 2020)case study research (case study) is research on a "unified system." Through this type of case study research, researchers will collect data on the availability of science laboratory equipment and reference books in junior high schools in Mataram City, NTB Province. From this data, meaning will be obtained regarding the profile of supporting facilities for natural science mini project practicum at the junior high school level. Data collection was carried out by means of documentation and observation studies. The source of the data in this study was Data Facilities for science laboratory equipment originating from schools in outside urban areas as many as 3 schools, namely State Junior High School (SMPN) 11 Mataram, SMPN 17 Mataram, and SMPN 21 Mataram.

The results of the percentages are converted into categories with the meaning of the percentages are:

Table 1. Assessment criteria

Percentage Intervals	Criteria
85% - 100%	Very Adequate
70% - 84.99%	Adequate
55% - 69.99%	Adequate
40% - 54.99%	Inadequate
< 39.99%	Very Inadequate

(Sugiyono, 2016)

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RESULTS AND DISCUSSION

Based on the results of content analysis of science learning outcomes in phase D, the learning outcomes that are the focus of the research are: students are able to classify living things and objects based on observed characteristics, identify the properties and characteristics of substances, distinguish physical and chemical changes and separate simple mixtures . From the learning outcomes mentioned above, the details of material that can be carried out in practicum include: classification of living things, identification of properties and characteristics of substances, physical and chemical changes and separation of simple mixtures. Data was present on table 2.

Based on the availability of laboratory equipment that can be used for natural science mini project practicum, it can be illustrated that the availability of laboratory equipment for science practicum activities at SMPN 11 Mataram is available 77.27% (adequate); SMPN 17

Mataram is available 77.27% (adequate); and SMPN 21 Mataram available 72.72% (adequate).

Table 2. Names of practicum tools needed and those available at school.

No	Practical tools	Availability of practical tools		
		SMPN 11 Mataram	SMPN 17 Mataram	SMPN 21 Mataram
1	Stirring Rod	Yes	Yes	No
2	Burette	No	No	No
3	Glass funnel	Yes	Yes	Yes
4	Separating funnel	Yes	No	No
5	Erlemeyer	Yes	Yes	Yes
6	Beaker	Yes	Yes	Yes
7	Measuring cup	Yes	Yes	Yes
8	Tripod	Yes	Yes	Yes
9	gauze	Yes	Yes	Yes
10	Volumetric flask	No	No	No
11	Mortar and Pestle	Yes	Yes	Yes
12	Spirit burner	Yes	Yes	Yes
13	Test Tube Clamp	Yes	Yes	Yes
14	pH Mater	No	No	No
15	Drop pipette	Yes	Yes	Yes
16	Volume Pipette	No	No	No
17	Drip plate	Yes	Yes	Yes
18	Test Tube Rack	Yes	Yes	Yes
19	Chemical spoon	Yes	Yes	No
20	Spatula	No	Yes	Yes
21	Test tube	Yes	Yes	Yes
22	Thermometer	Yes	Yes	Yes

For chemicals available in schools, among others. Availability of chemicals at SMPN 11 Mataram such as: a quades, alcohol, Biuret, Benedict, Calcium Chloride ($CaCl_2$), Calcium Sulfate ($CaSO_4$), Ethanol, Fehling A, Fehling B, Lugol, Potassium Sodium Tartrate, Calcium Oxide a (CaO), Lime tohor , Potassium Permanganate ($KMnO_4$), Sodium Hydroxide ($NaOH$), Copper Sulfate ($CuSO_4$), Vaseline, Vinegar, Baking Soda and Detergent. Availability of chemicals at SMPN 17 Mataram such as: Biuret NaOH, Benedict and Lugol. .Availability of chemicals at SMPN 21 Mataram such as: Sodium Hydroxide ($NaOH$), red litmus paper and blue litmus paper, biuret, benedict, lugol and quicklime. For the most part, available materials are often used to test food content.

The results of interviews with science teachers at SMPN 11 Mataram, currently the role of the science laboratory is functioning as a class. All practicum equipment is placed in the tool cabinet at the back and side of the room. For chemicals, the quantity and type are very limited. For SMPN 17 Mataram, currently the role of the science laboratory is used as a storage room for all work equipment, drum bands, and practicum tools. During the observation at the school, it appeared that the role of the laboratory was used as a storage room for all school facilities, this was because the school was carrying out a renovation for library facilities, and several classes. In the practicum tool room, they are arranged in a makeshift manner and stored in chemical tool cardboard boxes. For SMPN 21 Mataram, currently the role of the science laboratory is used as a multi-purpose room. Occasionally it functions as a classroom, sometimes as a meeting room for activities and even during observation it is used as a national assessment exam room. Tools and chemicals are kept neatly in the storage room for tools and materials. The three schools explained the same thing regarding the practical implementation techniques by bringing tools and chemicals into the classroom to carry out science practicums.

Overall, the educational unit that was the subject of the study was declared adequate in terms of the availability of laboratory equipment for science and chemical practice practicums, although this could not be carried out in the science laboratory room. Laboratory equipment and chemicals can be brought into the classroom under the supervision of a science teacher.

CONCLUSION

Based on the discussion of preliminary research studies related to supporting facilities for the implementation of junior high school science practicums, it can be concluded that the supporting facilities for junior high school natural science practicums in the city of Mataram are sufficient in carrying out natural science practicums at junior high schools, especially by applying the natural science mini project practicum model.

RECOMMENDATIONS

In line with the developments and demands of the 21st century which lead to collaboration, critical thinking, creative and communication, it is deemed necessary to develop a simpler science practicum model by utilizing supporting facilities from laboratory tools for natural science practicum activities. The availability of science practicum tools can support efforts to apply the natural science mini project practicum model so that it can increase knowledge abilities, especially higher-order thinking skills, skills in this case science process skills and attitudes, namely scientific attitudes.

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