ANALYSIS OF STUDENT WORKSHEET NEEDS IN SCIENCE PRACTICUM ACTIVITIES WITH PROBLEM-BASED LEARNING MODEL

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Abstract: This study aims to analyze the needs of student worksheets in elementary school science practicum activities with a *problem-based learning* model. This research is the initial stage of making student worksheets in practicum activities with *a problem-based learning model.* The subjects of the study were 10 grade IV students of SDN 010 Kundur. Researchers made observations and collected data through *Google form* questionnaires distributed via Whatsapp to students. The results of the questionnaire are presented in a descriptive form. Researchers also conducted interviews with teachers related to the learning process. The results of research obtained on students are in line with those obtained from teachers. The conclusion of the study is that student worksheets are needed in the science practicum learning process with a *problem-based learning* model.

Keywords: Problem-Based Learning, Practicum, Student Worksheets

INTRODUCTION

Practicum methods are known to allow students to learn a concept directly through observation and experimentation. Learning with practicum methods involves experimental learning based on concrete experiences and discussions with friends to obtain new ideas and concepts (Duda *et al*., 2019). In practicum activities, students will produce their own questions that help them expand, deepen and sharpen their thinking to construct new knowledge (Kurniawati & Wilujeng, 2018). Along with the rapid development of technology, practicum learning can be used to improve the quality of practicum learning itself (Indrawati *et al*., 2022).

Science lessons are interesting material because they discuss the universe that provides many benefits for life and are close to everyday life. With material that is already interesting, sometimes it looks unchallenging, difficult to understand and tends to be boring if only explained in the teaching (Yuanita, 2018). Elementary school science is a main subject in curriculum education (Khairani *et al*., 2020). Science is not only interpreted as producing products but also as a process of knowledge about the environment and its phenomena (Suryawati & Osman, 2018). Science learning includes four main elements, namely attitudes, processes, products, and applications. The four elements of science learning are realized through learning activities (Widodo *et al*., 2018). The skills possessed in science learning are called process skills, while the attitude that must be possessed is called a scientific attitude (Susilawati *et al*., 2020).

Based on initial observations, the lecture method still dominates the science learning process at SDN 010 Kundur, including subject matter that requires practicum activities. This happens because of the limitations of science KIT in schools. As for the results of interviews with class teachers who also teach science subjects, teachers do not use student worksheets specifically. The teacher only refers to the steps of the procedure listed in the printed book used. Teachers have also never created student worksheets. This is due to the lack of teacher knowledge in doing model variations in practicum learning.

Student worksheets are teaching materials that contain material, teaching students to experiment by following steps based on the scientific method (Fajarianingtyas *et al*., 2019). Student worksheets contain various components that aim to develop student's basic skills, such as using tools, measuring, and observing (Yuanita, 2018). Student worksheets are arranged based on the characteristics of the subject matter and students. This student worksheet is a guideline used by students to carry out investigation and problem-solving activities (Trianto, 2008).

To help the implementation of an effective and meaningful elementary school science practicum, variations in the implementation of practicum using learning models are needed (Rr. Arum Setyorini *et al.*, 2021). One of the learning models that can help the learning process is the *problem-based learning model.* The problem-based learning model focuses on students' learning proces, not on teacher teaching (Terry Barret, 2017). The key characteristic of the *problem-based* learning model is the problem at the beginning of the learning process before the next process is carried out, which is given to students (Hung, 2016). The learning model teachers use should be able to help students understanding of concepts and critical thinking skills. *Problem based learning* is chosen because it can develop critical thinking skills (Ardianto & Rubini, 2016; Sujatmika *et al*., 2019).

This study was limited to analyzing the needs that arise from observation and literature review. The results of this study can be used to complement previous research and expand knowledge related to making student worksheets in practicum activities with *a problem-based learning model.* With the analysis of student worksheets, it is expected to facilitate learning in science subjects. To benefit teachers, students and related parties (Richard I. Arends, 2012). Therefore, the analysis of the needs of these learners' worksheets needs to be done first. So that later it can help the process of making student worksheets for practicum activities using *a problem-based learning* model (Amalia *et al*., 2022; Damis Dewi Sundani *et al.*, 2021).

METHOD

This research is preliminary research from the research design of applying science practicum with a problem-based learning model. The subjects of this study were ten grade IV students of SD Negeri 010 Kundur. The research instrument is in the form of a Google form questionnaire distributed through the Whatsapp

application and filled in by research subjects. Before distributing questionnaires regarding the needs of these student worksheets, researchers also made observations. This research is qualitative research where humans are the object without any manipulation. The researcher's presence does not affect the dynamics of the object of study (Sugiyono, 2013).

This study presents descriptive data in the form of pie graphs. The charts are analyzed for easy understanding. Researchers also conducted observations and interviews with class teachers. The results of these observations, interviews, and questionnaires were collected. Then it is used as a foundation for making student worksheets in practicum activities with a problem-based learning model.

RESULTS AND DISCUSSION

Researchers have analyzed the needs of student worksheets in science practicum activities with a problem-based learning model through observation, interviews, and the distribution of questionnaires through google forms in the whatsapp application. Based on the needs analysis conducted during the science practicum learning process, data were obtained as presented in tables 1 and 2 below.

Table 1. Results of Observations on Science Learning

No	Observations
1	The main source of learning is still teacher-centered
2	Lecture methods still dominate learning
3	The learning media used still uses pictures and package books only
4	There are still students who have not actively participated in learning

Table 2. Results of Interview with Science Teacher/Homeroom Teacher

No	Observations
1	Teachers have never used a problem-based learning model in the learning process in the classroom
2	Teachers do not always carry out practicum activities in science subjects because of reluctance to prepare equipment
3	Teachers do not always use participant worksheets in science practicum learning
4	Teachers have never made separate student worksheets to support practicum activities in science subjects
5	Teachers agree if in science practicum learning using student worksheets

Researchers gave questionnaires on March 22 – March 27, 2023, to research subjects. The questions or statements given are five in number. The results of the questionnaire analysis are presented as follows:

1. Are there always teaching materials available in your school according to the science subjects taught?

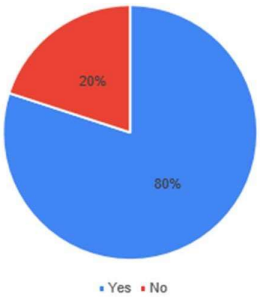

Figure 1. Percentage of Conformity of Teaching Materials

From Figure 1, it can be seen that the availability of teaching materials in schools must be in accordance with the science subjects taught. This is based on the response of 80% of students, who stated that the available teaching materials were in accordance with the subjects taught. However, 20% of students stated that the available teaching materials were still not in accordance with the subjects taught. This means that the available teaching materials are not 100% in accordance with the science subjects taught by the teacher.

2. Are there always worksheets available in your school to help with practicum activities for science subjects?

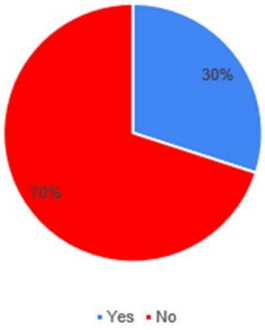

Figure 1. Percentage of Conformity of Teaching Materials

In the second picture, it can be seen that 70% of students state that student worksheets to help with practicum activities for science subjects are not always available. Only 30% stated that student worksheets were available for science subject practicum activities. From the picture above, it can be seen that it is necessary to make or develop student worksheets for science subject practicum activities.

3. Do you often do a practicum in science subjects?

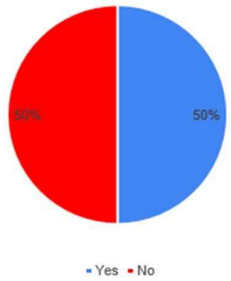

Figure 3. Percentage of Science Practicum Implementation

From Figure 3 above, it was found that the percentage was balanced between students who stated that they often did practicum in science subjects and students who stated that they did not often do a practicum in science subjects. This shows that practicum activities in science subjects are not always carried out.

4. Do you like to do practicum activities in science subjects?

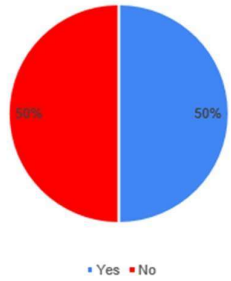

Figure 4. Percentage of Student Response in Science Practicum

Figure 4 presented above shows a balanced percentage of students who like practicum activities in science subjects and students who do not like practicum activities in science subjects.

5. Do you agree that using worksheets for learning students, in science practicum can help you learn and learn more focused?

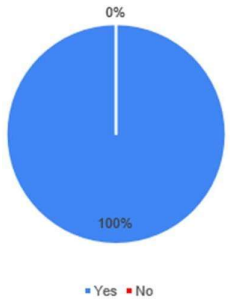

Figure 5. Percentage of approval to use student worksheets

Based on Figure 5, it was found that 100% of students stated the need for student worksheets. The existence of student worksheets can make the learning process more focused and certainly can help students learn.

Needs Analysis

Solving learning problems or critical thinking skills cannot be done in a vacuum. But it must be based on knowledge of real needs. Needs analysis is a treatment used to achieve learning goals from various fields (Engelhart *et al*., 1956). Schools need to know the condition of the basic needs of students. It is also important for teachers to teach in ways that help learners meet their basic needs, such as self-fulfillment, self-determination, having influence, and experiencing achievement and affiliation (Richard I. Arends, 2012).

It is also important for teachers to teach in ways that help learners meet their basic needs, such as self-fulfillment, self-determination, having influence, and experiencing achievement and affiliation. In fact, science practicum is rarely carried out for special reasons such as lack of infrastructure facilities and laboratory space (Prajoko *et al*., 2017). The results of interviews with class teachers who teach science subjects explain that teachers rarely do practicum because there are no labor and limited tools. Teachers have never made their student worksheets to support science practicum activities. Teachers have also never used problem-based learning models in ordinary and practicum learning.

Student worksheets are one of the right learning alternatives for students because student worksheets help students to add information about existing concepts learned (Trianto, 2008). Worksheets are used to assess how much students have improved as a result of the experiment. (Akbayrak & Kaya, 2020) Student worksheets are effectively used in the learning process (Dewantara *et al*., 2018; Hasja *et al*., 2020). Through observations and questionnaires, the needs analysis results were also obtained that student worksheets are needed for practicum activities with a problem-based learning model for science subjects.

From the research questionnaire data, it can be seen that 100% of students agree and state that the availability of student worksheets in science subject practicum activities will help learning and make the learning process more focused. This is also reinforced by previous research that student worksheets determine students' interest in reading and writing, allow students to make feedback in

learning activities, accommodate student's difficulties, and create flexible learning activities for student development (Saputro, 2019). So that student worksheets can effectively improve students' higher-order thinking skills, as shown by improved learning outcomes. In addition, student worksheets can motivate learners to learn to understand learning material more easily (Kahar *et al*., 2021) As (Melawati *et al*., 2022). The use of worksheets of students can improve their skills in solving problems and learning results.

Therefore, researchers offer solutions by using a problem-based learning model to make student worksheets in practicum activities. Problem-based learning is constructivist learning that can potentially improve students' science process skills. The application of problem-based learning has been revealed to have many advantages for exploring the environment as a learning resource (Duda *et al*., 2019).

Material Analysis

Researchers focus research on science subjects with practicum activities using problem-based learning models. Based on interviews and observations made, it was found that some science subject matter was not carried out in practicum. Teachers do not prepare worksheets for students specifically for practicum activities.

Meanwhile, science emphasizes providing direct learning experiences through the development of process skills and scientific attitudes using a scientific approach. Science is needed in everyday life to meet human needs by solving identifiable problems (Depdiknas, 2017). Science provides provisions to solve problems of everyday life, considering that science is a science that seeks answers to the questions of what, why, and how natural phenomena are related to the arrangement of structures and nature, changes and dynamics of nature (Kurniawan *et al*., 2019).

The findings of this study show that the average acquisition of students' creative thinking skills taught using *problem-based* learning models is better than conventional learning (Sihaloho et al., 2017). The problem-based learning model can improve learning activities and student learning outcomes (Kawuri *et al*., 2019).

Student Analysis

To find out how students' attitudes toward science subjects in the form of practicum activities, researchers need to conduct an analysis. The analysis is carried out so that researchers can make student worksheets according to the characteristics of students. Based on observations made by researchers during science subjects, it was found that teachers tend to lecture. Teachers still do not use learning models and media that suit the learning needs of students. As a result, science learning tends to be uninteresting. Science learning with the practicum method has not used student worksheets that help students better understand the lesson.

Science learning can be a vehicle for students to learn about themselves and the environment, as well as prospects for further development in applying it in everyday life. Science teaching can be used to understand nature, build attitudes and values, and increase faith in God Almighty (Depdiknas, 2017). The mercury method offers the possibility of significant improvement to learners. Practicum as

a means of practice and reflection. Many studies prove practicum implementation's benefits (Fuentes-Abeledo, 2020).

CONCLUSION

Based on the needs analysis results, it can be stated that the worksheets of students in science practicum activities with model problem-based learning carried out are needed. With the intention that learning objectives can be achieved properly and there is an increase in learning outcomes. The availability of worksheets for student's practicum activities in science subjects can provide direct experience of events in everyday life. In addition, the availability of student worksheets can also be a parameter for understanding the concept of science subjects that connects theory and proof of practice.

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