

# STUDENT WORKSHEETS CONSTRUCTION TRAINING ON EXPERIMENTAL LEARNING METHODS BASED ON BASIC SCIENCE PROCESS SKILLS IN ELEMENTARY SCHOOL

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## *Abstract*

*Science process skills in elementary school students can be developed through experimental learning methods. Teachers are required to be able to create learning that can stimulate these skills. This community service aims to train teachers to create experimental-based Student Worksheets (LKS) that can practice basic science skills. The service was carried out in July 2020. The target of the service is elementary school teachers level 4, 5, and 6 Elementary School Al-Karim Lampung with the number of participants being 13 people. The teachers' prior knowledge is known through the Quizizz platform. The results of the pretest showed that several teachers had low knowledge of basic science process skills. A total of 46.15% of teachers answered with an accuracy of less than 50%. The activity begins with lectures on science process skills, motivating teachers to be able to develop learning that trains science process skills, and training on making experimental-based worksheets that stimulate science process skills. Evaluation of activities carried out through questionnaires showed that this community service was able to motivate participants to develop learning that stimulates students' science process skills.*

**Keywords:** *experimental methods, elementary school, science process skills, worksheets.*

## INTRODUCTION

The quality of science learning in elementary school students can be seen in how this knowledge can be meaningfully absorbed by students so that students can solve problems they find in everyday life

(Firman and Widodo, 2007). Science learning at this stage must be able to emphasize the achievement of scientific understanding and skills that can train students' basic science process skills. Science process skills are needed in everyday life to identify problems and

develop hypotheses needed in the problem-solving process (Aktamış and Pekmez, 2011). This skill trains students to explore information, think about a problem, build knowledge and formulate learning outcomes (Lind, 1998). Science process skills are also related to the formation of students' creative thinking processes. This relationship was developed from the criteria of openness to flexibility, experience, and dissatisfaction with certain explanations and elaborations. The relationship is analyzed by Charlesworth & Lind (1995) as follows: observing skills make students sensitive and observant so that they are open to new experiences. Comparison skills make students think flexibly from various points of view. Grouping skills train students to be able to consider various ways of grouping things and provide detailed characteristics of group criteria. Communication skills make students able to provide clear and complete explanations. Therefore, science learning is needed so students can train their science process skills.

The importance of developing students' basic science process skills unfortunately has not been sufficiently understood by some educators at the elementary school age. There are still many elementary school students who have low basic science process skills. Several factors that encourage the low basic science process skills of these students are the low science background of the teacher and the lack of laboratory

facilities (Jack, 2013). One of the reasons for the low scientific background of teachers in primary schools is that teacher education does not come from primary school education or science education. The lack of laboratory infrastructure in elementary schools is an excuse not to introduce scientific activities through simple experiments.

Sekolah Dasar (Elementary School) Alam Al-Karim is an elementary school that has developed contextual learning that encourages students to relate knowledge to everyday life, students are also introduced to the natural surroundings so that learning is not only based on books as a learning resource, besides, this school also carries out active learning, centered on students and the teacher as a facilitator. However, one of the challenges faced is a large number of teacher resources with non-educational and non-science backgrounds who are involved in learning science at the school. This causes the idea to train science process skills is still very low. Many teachers still do not know about the concept of science process skills and how to create simple experiment-based learning that can stimulate these skills. Therefore, the purpose of this community service activity is to train the creation of Experimental Learning-based Student Worksheets that can stimulate students' basic science process skills.

## METHODS

This community service is carried out in three stages: preparation of activities followed by program

socialization, implementation of activities, and evaluation of activities (Figure 1). The procedure for the activity is as follows.

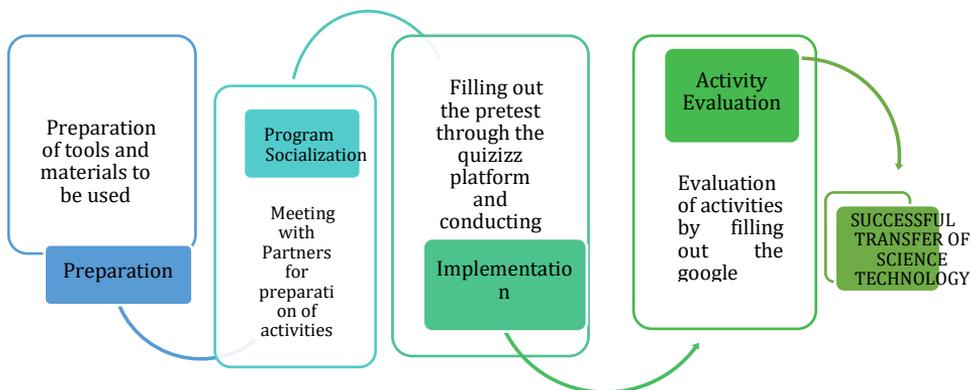


Figure 1. Community Service Procedure

### Preparation

Preparations are made to support community service activities. The preparations were carried out by designing Student Worksheets and making pretest questions to find out the teacher's initial insight into science process skills using the quizziz platform.

The design of the Student Worksheet begins with selecting the sub-learning materials. The selected sub-learning material is adjusted to the props used, namely Horta Dolls. Based on this, the material for 'plant growth and factors affecting it' was selected. Learning uses experimental methods so that the worksheets are designed in such a way as to support learning and train students' science process skills.

The preparation of pretest questions is intended to explore the teachers' prior knowledge. The questions made contain the following elements, namely questions about 1) the character of elementary school students; 2) science Process Skills; and 3) experiment-based learning. The number of questions given is 10 items. The questions are then given through the quizziz platform. The use of this platform also aims to introduce interesting and fun learning media to elementary school teachers because this platform offers problem-solving like playing an exciting and fun game.

### Activity Implementation

The community service activity was carried out in July 2020. The implementation of the activity began with filling in the pretest questions that had

been prepared then delivering the material and ending with the integration of basic science process skills in the Student Worksheet.

### Evaluation

Evaluation of activities is carried out based on participants' responses to the training via a google form.

## RESULT AND DISCUSSION

The implementation of this community service activity was carried

out in the open hall of the Sekolah Alam Al-Karim Lampung. The number of participants who took part in this activity was 13 people. The participants of the activity are teachers in grades 3, 4, and 5 of elementary school because at that level learning in schools has begun to be introduced to simple scientific learning. The activity begins with filling in the pretest by competing through the online game Quizziz learning media. Participants with the highest scores will get interesting souvenirs (Figure 2).



**Figure 2. Giving doorprizes to participants**

Through the results of the pretest (Table 1), it can be seen that the teachers do not have good prior knowledge about science process skills and experimental learning at the elementary school level.

This can be seen from the accuracy of answering questions where only 15.38% (2 people) of participants answered with 70% accuracy and a total of 46.15% (6 teachers) answered with an accuracy

percentage of less than 50%. This is of course very unfortunate given the importance of developing basic science process skills for students in elementary schools. Science process skills help students develop their thinking to make discoveries and become their provision to develop and acquire new knowledge (Widyaningsih, 2020). Therefore, in learning science, teachers are expected to be able to provide learning methods that

can hone science process skills. Ikhsan (2016) states that the use of learning media can stimulate students' science process skills. Experimental learning methods can be used as an alternative in learning that can improve students' science process skills. The research of Battjes-Fries et al (2017) showed that the group of students with experimental learning had a higher level of student science process skills when compared to the control group.

**Table 1. Pretest Results through Quizizz as Learning Media**

Player	Score	Accuracy
Muhammad yusuf S.F	6480	70%
Mufroil	5330	70%
Nur	5060	60%
Vini Lukita Sari	4850	60%
Arini Amalia Husna	4750	60%
Linda Kurniawati	4520	60%
Agus afriyanto	4490	50%
Setiyaningsih	4120	60%
Annisa Nur Rachmawaty	3960	50%
Dwi winarsih	3560	40%
Elis Novitaria	3360	40%
Ita Nurmala	3060	50%
Fernando Eko M	2700	30%

### Activity Implementation

The activity begins with the delivery of science process skills. The provision of

this material was delivered as a strengthening of participants' understanding of the importance of stimulating students' science process

skills in learning science in elementary schools. The material also presented basic science process skills which include observing, predicting, classifying, measuring, communicating, and concluding. Participants are also encouraged to introduce simple scientific methods in science learning and use

simple materials as learning media. In this community service, the author introduces Horta dolls as experimental learning media that can be used to stimulate basic science process skills. Furthermore, participants are introduced to making worksheets to support the learning.

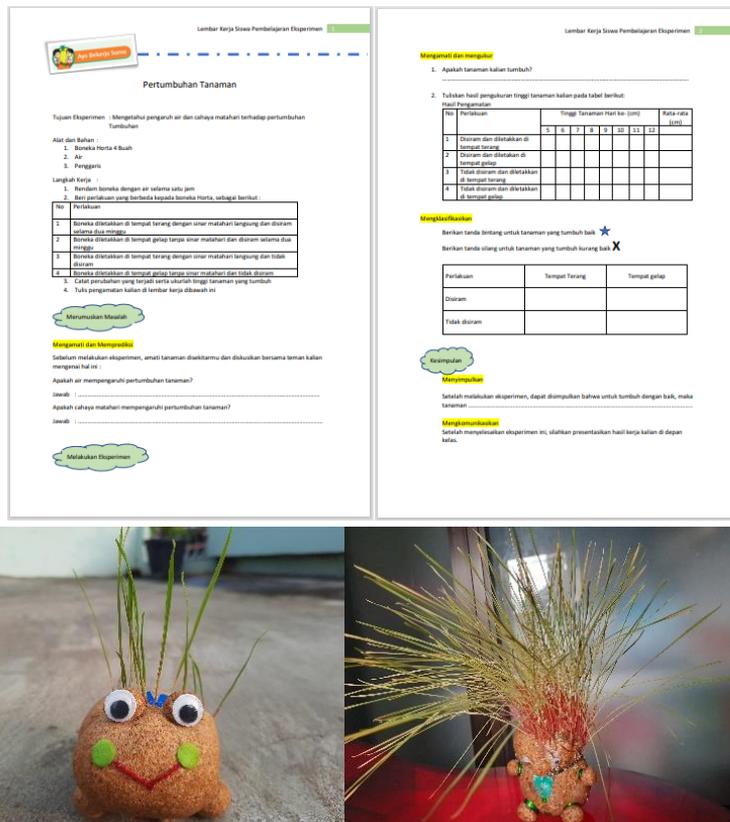


Figure 3. Example of Student Worksheet Based on Basic Science Process Skills Using Horta Dolls on Plant Growth Materials and Factors Affecting It

In making student worksheets based on science process skills, teachers are emphasized to include basic science process skills that will be developed in learning. The questions and instructions that are poured into the worksheets must be able to train students' science process skills. In this activity, teachers were also given examples of worksheets that could stimulate students' science process skills through experimental learning methods using Horta dolls on Plant Growth and the Factors Affecting it.

### Activity Evaluation

The response shown by the participants was quite enthusiastic. This can be seen from the interactive

discussions that show the participants' curiosity about the material provided. The discussion topics proposed by the participants included simple media/displays in learning, how to stimulate science process skills in simple activities, and further explanations in designing student worksheets based on students' science process skills. The enthusiasm of the participants was also shown from the results of the evaluation of the activity through the google form which stated that this activity added participants' insight into students' science process skills and encouraged participants to apply them in learning.



#### Figure 4. One of the participants asks a question during the training

This service activity is carried out as an effort to increase awareness of the importance of training students' science process skills in science learning. This is need to be done so that the learning process becomes student-centered with

the application of active learning. Bruner in Kumara (2004) states that in active learning students are encouraged to be able to conduct experiments and experiences in learning. With learning that trains science process skills, it is expected to create a generation that can think critically and be able to create solutions in the future. This activity also uses the Quizizz platform as learning media so it is hoped that teachers are encouraged to be able to use interesting learning media in learning.

#### CONCLUSION

This community service activity can motivate teachers to create science learning with experimental methods that can train students' science process skills. Teachers' insight into making student worksheets based on science process skills was also increased through interactive discussions that had been carried out.

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