

# Learning Media Based on Scientific Literacy for Elementary Students

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# Learning Media Based on Scientific Literacy for Elementary Students

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**Abstract.** This activity aims to provide mentoring and training for teachers in SD 3 Wergu Wetan on learning media based on scientific literacy. The instruments used in this activity were interview guidelines, observation sheets, and teacher's understanding questionnaire. Analysis of the data used is data triangulation. This activity begins with the needs analysis stage, the material workshop step, the media making the stage, the follow-up stage, the implementation phase of the media in learning and the evaluation stage. Based on data analysis found the results of this learning media can increase student learning activities with an average value of 84.8 or with good criteria. Likewise, the results of the questionnaire responses of students get an average score of 92.8 or with very good criteria. Thus it was concluded that this media could increase the activities of students and teachers had a better understanding of learning based on scientific literacy after receiving this training.

**Keywords:** learning media, scientific literasy, primary students.

## 1. Introduction

Improvements method in the industrial revolution era continues to be made so that the Indonesian nation is able to compete globally, among other things by changing the curriculum into the 2013 curriculum. This curriculum not only develops knowledge but also emphasizes skills and attitudes. Organized learning must be student-centered and facilitate students to find concepts [1]. The implementation of the Permendikbud is in accordance with the mandate of the 2013 curriculum including the school literacy movement and the application of 4C (Communication, Collaborative, Critical and problem solving, Creative and innovation) in learning [1]. The effectiveness of the 2013 curriculum implementation is determined by the context, inputs, and processes involved in the education process [2]. So one of the successes of learning is determined by the planning of the implementation of learning conducted by the teacher. Learning is not only done in lecture but must involve students actively in learning so that students have good literacy skills.

The implementation of literacy activities in schools is intended so that students are able to implement the material learned in daily life. The main concept of scientific literacy according to PISA (Program for International Student Assessment) is the application of scientific knowledge and skills possessed by students, obtained from the learning process to face challenges in daily life [3]. So, scientific literacy is a very important ability for students because it deals with how to solve problems.

But in reality, the achievement of scientific literacy of students in Indonesia is still low. In 2015 Indonesia was ranked 10th out of 72 other countries in the measurement of student

scientific literacy organized by the OECD (Organization for Economic Cooperation and Development) [4]. This shows that student achievement in Indonesia is still low. Therefore learning improvement is needed so that Indonesia is able to compete globally.

Student scientific literacy competencies are caused by many factors, including the organization of learning. The learning must make students actively analyze the material and implement the material in daily life. The structure of the questions given by PISA is related to high-level thinking so that refraction of these abilities is needed in learning. One of the factors that are able to improve students' higher-order thinking skills is learning media. Learning media is one of the important factors in the organization of PAKEM-based learning [5]. The media is very important in learning, especially science-based media because this media can promote investigative abilities, which lead to higher-order thinking skills [6]. Therefore, teachers need appropriate learning media to be able to improve students' literacy abilities.

Based on the results of a needs analysis conducted at SD 3 Wergu Wetan it is known that literacy activities have been carried out but are still monotonous, literacy corners have not been seen in the classroom, student activities in science learning are still low and teachers have difficulty in creating learning media based on scientific literacy. Whereas one of the determinants of learning quality is teaching aids [7]; [8]. Therefore, training and assistance are needed in making learning media based on scientific literacy.

Based on this background, the purpose of this activity is to describe the steps of mentoring activities and training in learning media based on scientific literacy, measuring student activities and measuring the practicality of learning media based on scientific literacy.

## **2. Methode**

This paper aims to describe the steps of mentoring and training for Wergu Wetan Elementary 3 teachers on learning media based on science literacy, measuring student activity and measuring the practicality of the media created. The step of this activity begins with a needs analysis of the importance of science literacy for elementary students, both through literature studies and field studies, providing workshops on science literacy for elementary learning, providing training in making media learning based on scientific literacy, follow-up activities, implementation of media use for students Elementary school and evaluation activities. This activity was given to teachers at SD 3 Wergu Wetan. The methods used in this activity are discussion, brainstorming, question and answer, observation and documentation. The instruments used were interview guidelines, questionnaires, and observation sheets. The instrument was analyzed by triangulation data.

## **3. Discussion**

This training and mentoring activity were carried out at SD 3 Wergu Wetan because based on the results of the needs analysis when monitoring and evaluating educational apprenticeship activities, the school had not implemented the school literacy movement (GLS). This is reflected in the literacy corner that does not yet exist in the class. After that, interviews were conducted with school principals and teachers related to the obstacles found in learning, especially science learning. After that, the team observed in several classes and found that the teacher had difficulty in making learning media based on scientific literacy. Whereas the literacy movement is one of the mandates of the 2013 curriculum. Finally, we agreed to carry out this mentoring activity.

After analyzing the needs in the field, the team analyzed the problems by the teacher and analyzed the basic competency that will be used to provide the material. Finally, themes were

chosen that represented the low class and high class to represent each level. In this activity, the learning media that will be given are four material themes namely the theme of animal motion systems with *ikuti langkahku* media, the theme of ecosystems with marine ecosystem diversity media, the theme of recognizing tree parts and animals with literacy trees media, the theme of metamorphosis material with media stages perfect metamorphosis and imperfect metamorphosis.

After needs analyzing, the next step is workshops on science literacy materials, science learning for students and learning media based on scientific literacy. This workshop is not only done by giving material from the team, but active participation is needed from the participants so that this activity is more discussion to get an ideal learning management for elementary students because the teacher is a figure that is dealing directly with students so they know more about the obstacles encountered when in class.

The workshop activities took place warmly, there were various ideas given, the teacher got input from the team, and the team also gained experience from the teacher. Lots of ideas and opinions were given at this activity. Although there had been a lively discussion related to the media, it was not a problem in this activity. The teacher believes that ICT media is more important than others, but the team provides an understanding that the core of science learning is inquiry activities so that in the learning process, students must participate more actively, find concepts through an experimental activity or project giving. If using the media, then the media also involves students to carry out activities, not just as a passive listener. This is in accordance with research conducted by Masfuah & Fakhriyah that project-based learning can improve students' understanding of scientific concepts, viewed from the literacy aspect [9].

The next problem is related to costs in making media. The team provides the teacher with an understanding that learning media does not have to be expensive, as long as it is relevant to the material and can improve student competencies. The team gave advice on the equipment used in making this media using used goods at a relatively low cost, including using used bottles, cardboard boxes, newspapers, and other waste. This workshop phase can be seen in Figure 1.



**Fig. 1.** Workshop Activities.

The next stage is planning learning media. The teachers brought used items needed and the team brought equipment such as scissors, glue, flannel, and instruments to beautify the media. The teachers look enthusiastic at this stage. They finally understood that the media did not have to be expensive, but used goods that became trash turned out to be interesting learning media. Media of marine ecosystems are made of boards with cardboard material, bottle caps as fish, pictures of marine biota such as squid, plankton, whale, seaweed, jellyfish

and others. The paper is drawn and beautified. The results of the marine ecosystem media can be seen in Figure 2.



**Fig. 2.** Making of Marine Ecosystem Media.

The media can be posted in the corner of the class. The use of the media is equipped with a question card so that it can be used as an interesting game. The second media is the literacy tree. This literacy tree is made of cardboard boards, flannel for making tree parts, paper for making leaves, fruit, beetles, and butterflies. This media can be used for low classes to explain the parts of plants and their functions. In addition, the teacher can also explain the pollination material for high-class students. The use of this media can also be equipped with question cards so that it is more interesting and sharpens students to think. The literacy tree created can be seen in Figure 3.



**Fig. 3.** Literacy tree media.

The third media follow my steps. This media is made from used bottles, colored paper made in rabbit shapes, cat shapes, butterfly shapes, and other animals. The purpose and purpose of giving this media so students are able to bend the types of animals based on how to move, the number of legs, grouping based on the place of life. In addition to motion system material, this media is used as a place to put pencils or other equipment because this media can be hung or attached to the wall.

The fourth media is the metamorphosis stage. This media is made from used twigs/wood, stuffed butterflies and leaves made of flannel cloth containing used plastic. In this media, it is seen the stages of perfect and imperfect metamorphosis of animals. Media metamorphosis stages and the media follow my steps can be seen in Figure 4.



**Fig. 4.** Metamorfosis and Ikuti Langkahku Media.

After the manufacturing phase, the next stage is the follow-up activities. In this step, the teacher practices how to use the media. Aside from being a literacy corner, these media can increase students' thinking skills and analytical skills because the media are equipped with question cards and worksheets so that there is a knowledge improvement experienced by students. The question cards and worksheets can increase students' active participation because there are rewards and treatments given by the teacher so as to create a fun game. The media is not made a patent but students can remove and modify it so that initially the media only contains blank paper then after being able to answer questions, students can paste the media used so that the media is also able to hone student creativity. Therefore, the media is not only a display item and makes students passive but involves students to think and do so that more make students actively find concepts. Rules for the use of the media can be modified so that it depends on the creativity of the teacher. The use of card-based media such as monopoly can increase students' critical thinking in science learning [10].

The next stage is the implementation of the media used in learning. The media is applied to thematic learning, so it is not only for science content but for other content, including Indonesian. Students are able to describe objects or make sentences or text fiction or non-fiction. However, this implementation phase is applied to science content. Students use the media in learning that is equipped with question cards and worksheets then they must present it to the class. At this implementation stage, the teacher observes the enthusiasm and activity of students in learning as measured by the observation sheet. The results of the observation showed that student activities had an average of 84.8 or with good criteria. Based on these results, it is known that learning media based on scientific literacy can improve student learning activities and outcomes. Presentation media-based learning media affect student learning outcomes and interest in learning [11].

The final stage in this activity is the evaluation phase. At this stage, the team and teacher evaluate the mentoring and training activities that have been carried out. There is no

meaningful input in the implementation of this activity, it's just that the media created must be larger if used for the discovery method or each group must get media so that all students can actively participate. At this stage, the team gave a response questionnaire about the practicality of making and using the media in science. The results of the response questionnaire obtained an average value of 98.2 or in the excellent category. Based on these results it is known that this media is easy to make and use by teachers. The teacher also agreed that mentoring and training like this would be done routinely every month. One of the main keys in learning science is group work that leads to the ability to think and solve problems [12].

#### **4. Conclusion**

This training and mentoring activity begin with a needs analysis, material workshop stages, product manufacturing stages, follow-up stages, product implementation stages, and evaluation stages. Based on the implementation phase and evaluation stage, it is known that student activities after the application of natural science learning using the media have an average value of 84.8 or with good criteria, while based on the questionnaire the teacher's response to the making and use of media obtained an average value of 98.2. Based on these results it is known that learning media based on scientific literacy can be used in learning and can increase student activity.

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