

# Improving Visual Literacy Skills of Elementary School Students Against Science Materials in Online Learning

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**Abstrak:** Kemampuan literasi merupakan hal mendasar yang harus dimiliki siswa dalam menghadapi era global untuk dapat memenuhi kebutuhan hidup dalam berbagai situasi. Tujuan dari penelitian ini adalah untuk menguji penguasaan literasi sains siswa kelas 5 SD yang diukur dengan soal-soal bergambar yang difokuskan pada mata pelajaran biologi. Penelitian ini dilakukan pada siswa kelas V SD Negeri 10 Cibiru Bandung. Sampel terdiri dari 10 siswa yang diambil dengan metode cluster random sampling. Tahapan penelitian ini adalah pre-test - treatment - post-test. Kesimpulannya masih banyak siswa yang belum mengetahui literasi sains. Hasil penelitian menunjukkan bahwa rata-rata skor post-test siswa sebesar 80,1%, lebih besar dari rata-rata skor pre-test yaitu 40,8%, sehingga selisihnya adalah 39,3%. Oleh karena itu, kompetensi inti dapat meningkatkan minat siswa terhadap literasi sains. Pemahaman siswa terhadap materi "organ pernapasan" dapat ditingkatkan dengan meningkatkan kompetensi inti dengan penyampaian materi menggunakan Powerpoint atau platform YouTube yang dilakukan secara daring melalui aplikasi Zoom dengan pendidik.

**Kata kunci:** literasi visual, literasi sains, organ pernapasan, sekolah dasar

**Abstract:** Literacy ability is a fundamental thing that must be possessed by students in facing the global era to be able to meet the needs of life in various situations. The purpose of this study was to examine the mastery of science literacy for grade 5 elementary school students as measured by pictorial questions focused on biology subject. This activity was conducted on fifth grade students at Cibiru 10 Elementary School Bandung. The sample consisted of 10 students who were taken by cluster random sampling method. This activity stage is pre-test - treatment - post-test. The conclusion is that there are still many students who do not know scientific literacy. The results showed that the average post-test score of students was 80.1% greater than the average pre-test score of 40.8%, so the difference was 39.3%. Therefore, Core Competencies can increase students' interest in scientific literacy. students' understanding of the material "respiratory organs" can be improved by increasing core competencies by delivering material via Powerpoint or YouTube platform which is carried out online from the use of the Zoom application with educators.

**Keywords:** visual literacy, scientific literacy, respiratory organs, elementary school

## 1. Introduction

In elementary schools, science learning is a very important subject because it makes students think critically, act realistically, be able to solve problems that occur in the

environment around us and be able to compete internationally (Kayan, 2021). Science learning aims to develop science process skills, as well as solve problems and draw conclusions based on understanding scientific concepts obtained from observations of the natural environment (Arifin, 2020). The science learning process should provide a direct learning experience based on the development of process skills and scientific attitudes. With direct learning, students can solve various types of simple problems related to real life, this will motivate students actively in compiling their knowledge to obtain the expected science learning outcomes (Akbari *et al.*, 2021).

Learning that aims to improve students' abilities optimally must be done through structured and measurable steps. One way to arrange learning in accordance with these principles is to use a scientific approach (Setiawan, 2019). The scientific approach has high effectiveness in improving the learning outcomes of each cognitive aspect of students at the level of knowledge, understanding, and application. In general, the scientific approach is structured over several steps of activity in sequence; observing, asking, collecting information, conducting experiments, processing data, and communicating the results (Setiawan, 2019). This step is used to provide experience to students so that the information obtained is more meaningful, tested, and can be accounted for (Setiawan, 2019).

Scientific literacy is the ability to use scientific knowledge in an effort to solve problems. Literacy is important to be mastered by students in the way students get to the environment, health, economy, and other problems faced by modern society who really understand technology and progress, as well as the development of science (Asyhari and Hartati, 2016). Scientific literacy is an ability that does not only read or write but the ability to understand science, distribute scientific information orally and in writing, apply scientific skills to solve problems, and have a high sensitivity to oneself and the surrounding environment (Putri *et al.*, 2021).

One of the lessons that became an interesting discussion material for educators along with the implementation of the 2013 curriculum was scientific learning. Learning that adheres to constructivism is considered to be able to answer the demands of national education goals to be achieved at this time. The application of this learning becomes a challenge for the teacher through the development of student activities during the learning activities (Asyhari and Hartati, 2016). Activities in scientific learning are activities designed to be able to develop thinking skills so that they can develop students' curiosity (Asyhari and Hartati, 2016).

At the elementary school level, Natural Sciences or science is one of the subjects that

occupies an important role in education, this is because science can be a provision for students in facing various challenges in the global era (Yuliati, 2017). Therefore, a learning method is needed that can prepare students to have good competencies and be literate in science and technology, able to think logically, critically, creatively, argue correctly, be able to communicate and collaborate. Science literacy can be termed as scientific literacy ability, namely the ability to understand science, communicate science (oral and written), and apply scientific abilities to solve problems so that they have a high attitude and sensitivity to themselves and their environment in making decisions based on scientific considerations. (Yuliati, 2017).

Based on PISA (Program for International Student Assessment) data, the scientific literacy ability of Indonesian students is still below the average when compared to the international average score and is generally at the lowest stage of PISA measurement (Yuliati, 2017; Setiawan, 2020). One of the factors thought to contribute to the student's difficulties is the inability of a teacher to visualize phenomena related to the material being studied (Damayana *et al.*, 2018). Some experts in their research suggest that one way to overcome these student difficulties is to provide a learning media that is able to visualize a phenomenon, making it easier for students to criticize concepts (Damayana *et al.*, 2018). Visualization given during learning is considered important because it can facilitate students in thinking critically about the material being studied. Visualization can be presented in various visual forms that will provide a lot of information that reinforces and complements verbal content (Damayana *et al.*, 2018).

The problem that is often faced by prospective teachers in the application of deep scientific literacy is that they have rarely been led to think at a high level in learning, then coupled with weaknesses in communicating ideas or information in a straightforward manner, lack of insight in reading literature and lack of insight into thinking (Syofyan, 2019). This engagement on the application of scientific literacy in science learning materials for prospective elementary school teachers in facing 21st century education is to facilitate prospective elementary school teachers to apply things that support science literacy learning, namely teachers teach students to be able to construct meaning, determine to use learning models active as a learning model, and teachers must be capable in their fields, must master technology, be able to carry out learning to improve student competence, certainty of choice to teach and teachers must be able to teach in multicultural conditions (Syofyan, 2019).

Breathing is the activity of air and exhalation. Air contains various gas components, one

of which is oxygen (O<sub>2</sub>). This oxygen is needed by the body. Oxygen enters the body through breathing. Furthermore, breathing produces carbon dioxide (CO<sub>2</sub>) which is removed from the body. Breathe using breathing apparatus. The human respiratory organs are the nose, throat and lungs (Chandra *et al.*, 2021).

The theme of human respiratory organs and the health of human respiratory organs is a thematic material for class V SD, is a sub-theme 2 focused on learning Indonesian, PPKn, IPA, IPS, SBdP with the scope of learning 1 to learning 3. In learning, the theme of human respiratory organs includes: (1) the names of the human respiratory organs. (2) the function of the human respiratory organs. (3) diseases of the respiratory organs. (4) how to maintain the health of the respiratory organs. Based on the description above, this study aims to describe increasing the profile of students' scientific literacy skills through scientific learning.

## 2. Methods

This activity approach is a qualitative approach with the method used is the case study method. Data collection techniques in the form of pre-test, treatment, post-test and observation. The pre-test will contain 12 multiple choices via the Quizizz app. This was done to determine the students' initial knowledge about the respiratory organ material and to compare it with the post-test results. After being given a pre-test, we will provide learning for 5 meetings, namely by giving learning videos and powerpoints to students as shown in Fig. 1. Then students will be asked to read for 15 minutes and watch the learning video before learning and ask students to send photos or videos as evidence that they are reading. After that, students will be asked about the material they read before through a question and answer session in a zoom meeting. After the activity is complete, students will be given a post-test through the Quizizz application with the same choice of questions and answers as in the pre-test as shown in Fig. 2. This is done to find out what changes occur in children after doing this movement. The data that has been collected is then analyzed and processed to obtain results and conclusions.

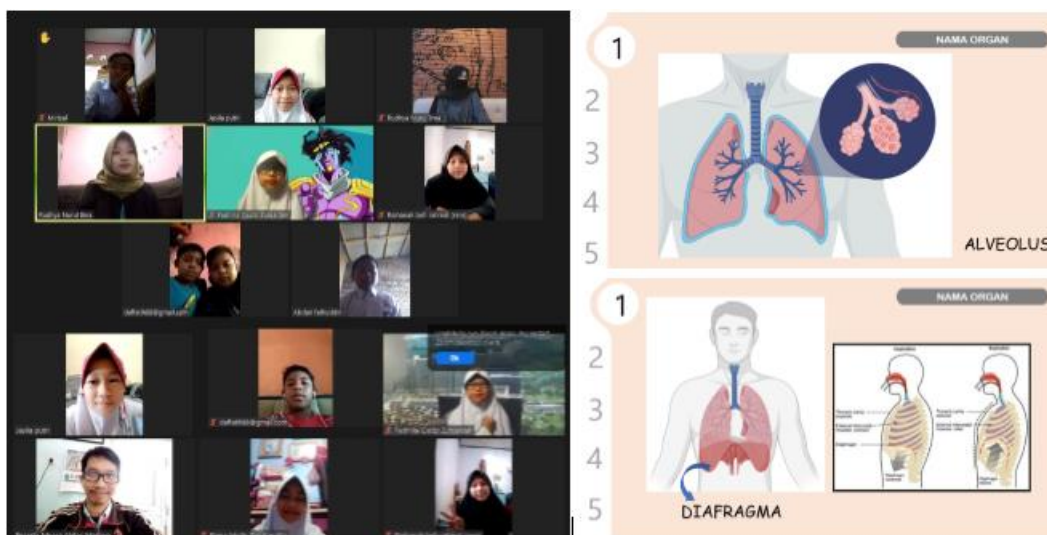


Fig. 1. Online learning activities through the zoom application

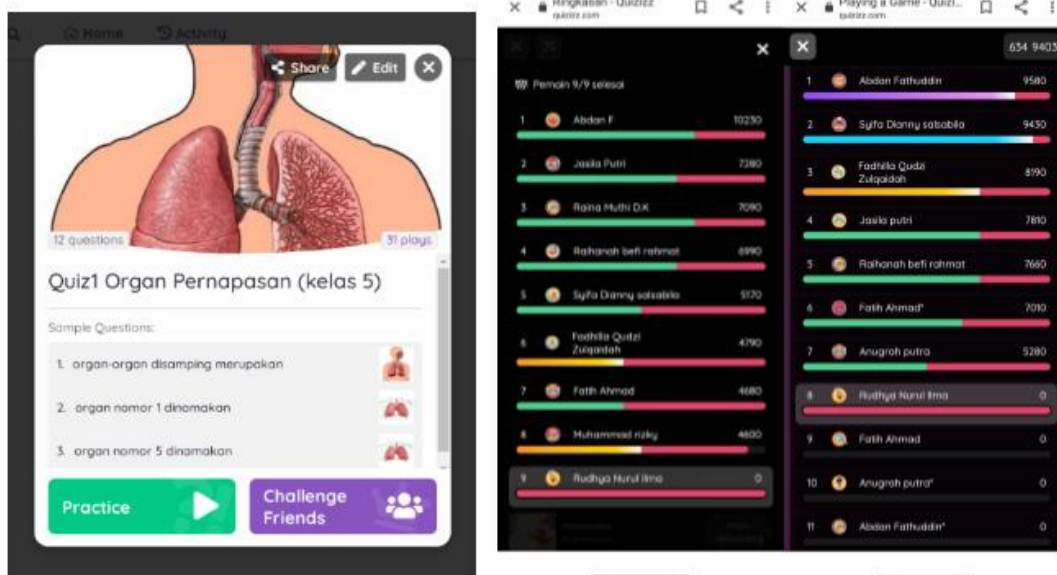


Fig. 2. Pre-test and post-test via Quizizz app

### 3. Result and Discussion

#### 3.1. Demography

This activity was conducted in elementary schools. The first step in this activity is to survey the number of students in the school by interviewing the principal. The number of students recorded was 365. Then we chose a sample from the population and obtained 10 students with details of 6 students male and 4 female students from class V.

### 3.2. Pre-Test and Post-Test Result

Table 1 describes the difference in the scores of the questions posed by the pre-test and post-test. The first questionnaire that was made was a pre-test questionnaire. This questionnaire was distributed to fifth grade elementary school students, which aims to find out the extent of the material on "human respiratory organs" by filling out 12 questions. After that, we will provide material about "human respiratory organs" through YouTube video and Powerpoint learning media. After explaining the material, we redistributed the questionnaire with the same questions in the form of a posttest to students with the aim of understanding the material "human respiratory organs".

Table 1. Pre-test and post-test results.

No.	Questions topic	No. question	Pre-test		Post-test	
			true	false	true	false
1	image provided. Students are asked what is the name of the organ designated	1-4, 12	32.0%	60.8%	64.0%	36.0%
2	image provided. Students are asked the function of the designated organ	5	30.0%	70.0%	100.0%	0.0%
3	provide an overview of an organ. Students are asked the name of the organ in question	6	30.0%	70.0%	80.0%	20.0%
4	respiratory system disorders	7	40.0%	60.0%	70.0%	30.0%
5	cause of respiratory problems	8, 9, 11	43.0%	57.0%	76.7%	23.3%
6	how to maintain the health of the respiratory organs	10	70.0%	30.0%	90.0%	10.0%
		<b>12</b>	<b>40.8%</b>		<b>80.1%</b>	
			<b>Enhancement 39.3%</b>			

The results show several discussion points:

- (i) Question topic number one increased by 32.0% after giving the material
- (ii) Question topic number two improved the most among other questions by 70.0% after being given the material
- (iii) Question topic number three results increased by 50.0% before and after giving the material.
- (iv) The result of question topic number four increased by 30.0% after being given the material.
- (v) Question topic number five results increased 33.7% after being given the material
- (vi) Question topic number six results increased by 20% after being given the material

#### 4. Conclusion

The conclusion is that there are still many students who do not know scientific literacy. The results showed that the average post-test score of students was 80.1% greater than the average pre-test score of 40.8%, so the difference was 39.3%. Therefore, Core Competencies can increase students' interest in scientific literacy. students' understanding of the material "respiratory organs" can be improved by increasing core competencies by delivering material via powerpoint or YouTube which is carried out online from the use of the zoom application with educators. Online learning through the zoom application and giving assignments on Quizizz app can be one of the easiest ways to implement this distance learning program.

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