

Implementasi of Photosynthesis Learning Video to Improve the Critical Thinking ability of SD Students in the Era of Pandemy Covid-19

Endah Kusumawati^{a*}, Heny Sulistyaningrum^b

Universitas PGRI Ronggolawe, Tuban, Indonesia

*e-mail address: endah.tbn1@gmail.com

Abstract

Learning in the pandemic era requires teachers to be more innovative in delivering learning materials. The four skills that must be possessed by a teacher in the 21st century are known as the 4C which consists of critical thinking, collaboration, communication, and creativity. This study aims to describe the critical thinking of students in class IV SDN Prunggahan V, Semanding sub-district, Tuban district, totaling 36 students in science learning in terms of the application of learning videos about photosynthesis. This research is descriptive exploratory research. Data on critical thinking skills were obtained from student worksheets whose indicators refer to Bloom's taxonomy level C3 (applied) and C4 (Analysis). From the results of student data analysis, it can be concluded that the application of instructional videos in the pandemic era can improve students' critical thinking skills in process skills and analytical skills in science lessons regarding photosynthesis.

Keywords : Science Learning Videos, Critical Thinking Skills

1. Introduction

The very rapid development of science and technology in the 21st century is a sign of the era of globalization (Cintamulya, 2015; Rakhmawati, Ramli and Sapartini, 2016; Kaufhold, Bayer and Reuter, 2020). The rapid advancement of technology causes changes in patterns in every area of life, including patterns for improving the quality of education (Solichin, 2017). Quality education is one of the means to shape the nation's future generations in the future. Current technological developments in education that play a role in the learning process must be able to influence curriculum development in three ways, namely: (1) The use of new technology becomes the social goal of the curriculum; (2) Technology provides resources for curriculum development, because it can make educators find and collect teaching material and also guide students in learning; (3) Technology can provide tools for assessing various areas of practice, such as simulation, which is making models or visualization tools in the field of science and tools for analyzing manuscripts in the literature (Horowitz et al., 2005). The current curriculum in Indonesia is the revised 2013 curriculum which is a refinement of the previous curriculum.

The 2013 curriculum develops two learning processes, namely direct teaching and indirect teaching. Direct teaching is a process that develops knowledge, thinking skills, and psychomotor skills of students through direct interaction in the form of activity-

based learning activities. In indirect teaching students carry out learning activities which include observing, asking questions, gathering information, associating or analyzing, and communicating what they have found in analytical activities. Plus in the industrial era 4.0 the use of information and communication technology must be applied in learning in the 2013 curriculum, it is hoped that it can develop an innovative learning process (Widodo, Rafi and Ghani, 2017; Fajar, 2020). The development of this direct learning process focuses on students to be more active in building knowledge that can be implemented with the critical thinking learning method.

The ability to think critically is an important ability for students in science learning, because science learning students are required to analyze, solve problems, and evaluate objects in learning. The means that can support in practicing critical thinking skills is the existence of good teaching materials that can make students more active, creative and innovative. According to Ikhsan, Sutarno, & Prayitno (2016), the competence needed for a teacher in carrying out his duties is to develop teaching materials as a means of preparing for learning activities. Efforts are needed by a teacher in improving the learning paradigm because teachers have an important role so that teachers are required to have strategies and creativity in the learning process.

The characteristics of someone who has the ability to think critically according to Setyawati (2013), namely being able to solve a problem with a specific goal, being able to analyze and generalize ideas based on existing facts, and being able to draw conclusions and solve problems systematically with correct arguments. If a person is only able to solve problems without knowing the reason for the concept being applied, then that person cannot be said to have the ability to think critically.

Video as one of the advances in technology has had many positive influences and advances for humans and their culture. With video, it is no longer difficult for people to get various information, knowledge and entertainment. Events and important events that occur in all corners of the world can be witnessed easily and quickly, this makes the wide world seem to be narrow and almost no longer known by the boundaries of time and place.

In the era of the Covid-19 pandemic that has hit almost the entire world of video in the last two years, the benefits of video have had a very big impact on providing student learning in distance learning. According to Aqib (2013: 51), among others: 1) Learning is clearer and more interesting; 2) the learning process is more interaction; 3) efficiency of time and energy; 4) improve the quality of learning outcomes; 5) learning can be done anywhere and anytime; 6) fostering a positive attitude towards learning process and material.

The science learning process in elementary schools related to photosynthesis occurs a lot of misconceptions so that with the use of learning videos it is hoped that students will be able to build students' understanding of critical thinking in learning (Hermayani, Dwiausti and Marjono, 2015). The process of photosynthesis generally only takes place in plants with chlorophyll during the daytime as long as there is a light source.

2. Research Method

This research uses quantitative research because the research data is obtained from a post test in the form of numbers. Sources of data obtained from students directly from the subject of photosynthesis.

This research was conducted at SDN Prunggahan V which consisted of 32 students consisting of 20 female students and 12 male students. SDN Prunggahan V is located in Mojokopek hamlet, Prunggahan Kulon village, Semanding district, Tuban.

This research uses quantitative research because the research data is obtained from a post test in the form of numbers. Sources of data obtained from students directly from the subject of photosynthesis.

This research was conducted at SDN Prunggahan V which consisted of 32 students consisting of 20 female students and 12 male students. SDN Prunggahan V is located in Mojokopek hamlet, Prunggahan Kulon village, Semanding district, Tuban.

Table 1: Criteria for testing the validity of the items

Coefficient	Category
0,80 rh 100	Very high
0,60 rh 0,80	high
0,40 rh 0,60	enough
0,20 rh 0,40	low
0,00 rh 0,20	Very low

The reliability test of the questions can be seen through the output reliability statistics, namely the standard reliable 0.6. If reliable 0.6 indicates a poor reliability, whereas if reliable 0.6 then reliable can be accepted or can be called good. The reliable test can be seen in the table:

Table 2: Criteria for test reliability questions

Coefficient	Category
0,80 r11 100	Very high
0,60 r11 0,80	high
0,40 r11 0,60	enough
0,20 r11 0,40	low
r11 0,20	Very low

The ability to think critically of students individually is obtained by the following formula:

$$\text{Score} = \frac{S_i - D}{m} \times \frac{D}{S_i} \times 100\%$$

3. Result and Discussion

The recapitulation of test results obtained by students from the test results of students' critical thinking skills (Tabel 3):

Tabel 3. Test results of students' critical thinking skills

No	Aspects of critical thinking	Critical thinking indicator	Percentage	Criteria
1	Provide further explanation	Defines terms	98,44%	Very critical
2	Give a simple explanation	Ask and answer questions from an explanation	73,04%	Very critical
3	Give a simple explanation	Understand the process	96,09%	Very critical
4	Give a simple explanation	Summing up the results	97,05%	Very critical
average			87, 66%	Very critical

Sumber : processed data

Based on the data obtained, an average of each student's critical thinking indicator was 87.66% with very critical criteria. From the critical thinking test about photosynthesis (Tabel 4)

Tabel 4. critical thinking test about photosynthesis

No	The value of critical thinking	F
1	75	4
2	80	6
3	85	3
4	90	11
5	95	4
6	100	4

Sumber : Data diolah

From the data it was obtained that the value of students' critical thinking through learning by using instructional videos could be said that critical thinking was very good. This can be seen from the score obtained from each student with the post-test questions that have been given.

Even though with the spread of the Covid-19 virus which requires distance learning (PJJ), it does not reduce the quality of students to be more advanced and creative in completing learning tasks carried out by teachers. From various media that can be accessed by students easily, this will make it easier for students to increase reading literacy from the media that students are learning. That way real learning is learning that does not have to require face-to-face because the teacher's creativity in transferring knowledge to students which will make learning more meaningful and support student success.

4. Conclusion

Data on critical thinking skills were obtained from student worksheets whose indicators refer to Bloom's taxonomy level C3 (applied) and C4 (Analysis). From the results of student data analysis, it can be concluded that the application of instructional videos in the pandemic era can improve students' critical thinking skills in process skills and

analytical skills in science lessons regarding photosynthesis.

References

- Ennis, R. H. 2011. *The Nature of Critical Thinking : An Outline of Critical Thinking Dispositions and Abilities*. University of Illinois. Diakses pada 18 Oktober 2016.
(http://faculty.education.illinois.edu/rhennis/documents/TheNatureofCriticalThinking_51711_000.pdf)
- Fridanianti, A., Purwati, H., & Murtianto, Y. H. 2018. Analisis Kemampuan Berfikir Kritis Dalam Menyelesaikan Soal Aljabar Kelas VII SMP Negeri 2 Pangkah Ditinjau Dari Gaya Kognitif Reflektif Dan Kognitif Impulsif. *Aksioma* , Vol. 9, No. 1.
- Cintamulya, I. 2015 'Tinjauan Tentang Teknologi Dan Pembaruan', 1(2), pp. 82–94.
- Fajar, A. M. 2020 'Electronic copy available at: <https://ssrn.com/abstract=3591119>', 2019.
- Hermayani, A. Z., Dwiastuti, S. and Marjono, M. 2015 'Peningkatan Motivasi Belajar Dan Kemampuan Berpikir Kritis Siswa Pada Materi Ekosistem Melalui Penerapan Model Inkuiri Terbimbing', *BIOEDUKASI (Jurnal Pendidikan Biologi)*, 6(2), pp. 79–85. doi: 10.24127/bioedukasi.v6i2.335.
- Horowitz, F. D. et al. 2005 'Educating teachers for developmentally appropriate practice', *Preparing teachers for a changing world: What teachers should learn and be able to do*, pp. 88–125.
- Kaufhold, M., Bayer, M. and Reuter, C. 2020 'Rapid relevance classification of social media posts in disasters and emergencies : A system and evaluation featuring active , incremental and online learning', *Information Processing and Management*, 57(1), p. 102132. doi: 10.1016/j.ipm.2019.102132.
- Rakhmawati, E. K. A., Ramli, M. and Sapartini, R. R. 2016 'Pengaruh Assesment For Learning Terhadap Kemampuan Berargumentasi Siswa Sekolah Menengah Atas', 5(April).
- Solichin, M. M. 2017 'Penerapan Model Pembelajaran Inquiry Discovery dalam Pendidikan Agama Islam'.
- Widodo, S. T., Rafi, M. and Ghani, A. 2017. 'Indonesian Journal of Primary Education Pengembangan Media berbasis Web (Virtual Map) sebagai Inovasi Media di SD', 1(2), pp. 57–61.
- Sulistyaningrum, H., Winata, A., & Cacik, S. 2019. Analisis Kemampuan Keterampilan Awal Abad 21 Mahasiswa Calon Guru SD. *Jurnal Pendidikan Dasar Nusantara* , 5 (1), 142-158. <https://doi.org/10.29407/jpdn.v5i1.13068>