

The use of balloon breathing stimulation media to encourage students' participation in learning science during the Covid-19 Pandemic

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Abstract: The purpose of the article is to describe improving the effectiveness of distance learning and the creative thinking of students to understand scientific concepts, especially human respiratory system material in grade V elementary school students. The implementation step: The preparation is the creation of an innovative lesson plan. The curriculum is designed to create a distance learning experience that stays active and creative. The learning process is done online through WhatsApp Group. Based on the distance learning that has been implemented, it can be concluded by using the media "Balloon Breathing Stimulation Media" can improve students' creative thinking in science learning. Cognitive, affective, and psychomotor skills also improve as creative thinking skills increase. The use of the media " Balloon Breathing Stimulation Media " which is held by online learning can increase student motivation in the learning process. The increase in learning motivation is also a boundary with the increase in creative thinking skills in the science literacy school. Based on the analysis of the learning activities, it concluded that the use of " Balloon Breathing Stimulation Media " media in scientific learning is effective to increase the students' creative thinking ability and motivate the student in the learning process during the COVID-19.

Keywords: Covid-19 pandemic; Balloon breathing stimulation media; Science learning

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Introduction

At the end of 2019 in China, there was an outbreak of disease caused by the coronavirus of SARS-CoV-2 or Covid-19. This was a new type that was found in the world. It didn't take long, this Covid-19 quickly spread throughout the world to the point where it gave uncertainty to the whole order of human life and even continued until the end of 2020. Therefore, this had a huge impact on education, starting from the widespread closing of schools at all levels, both from study group to tertiary level to the policy of implementing distance learning (Setiawan, 2020, p. 29; Nisa & Wiarsih, 2021, p.1).

The pandemic has affected the education aspect in Indonesia. Rachmawati, et al revealed that the industrial revolution 4.0, which has been widely discussed in 2019, has experienced an acceleration during this pandemic. The article also says that education that is carried out

both formally and informally is forced to change to an online method so that educators such as teachers, lecturers, and various kinds of instructors must be technologically literate (Rachmawati et al., 2020, p. 31). The Covid-19 pandemic has also forced the Indonesian government to carry out various policies in education through a joint decision between three Indonesian government agencies number 01/KB/2020, number 516/2020, number HK.03.01/MENKES/363/2020, number 440-882/2020 which states that areas with orange and red zones of Covid-19 are prohibited from conducting face-to-face learning processes (Ministry of Education and Culture, 2020). But in fact, almost all schools in Indonesia are conducting distance learning during the Covid-19 pandemic.

In the distance learning that was carried out, the content of science lessons required special attention. This is understandable for science is inseparable from its nature, namely science as a process, as a product, and as a scientific attitude. As shown by Khasanah and Sari (2019, p. 365), science can be seen as a way of thinking that students can use to develop their thinking skills. In line with educational problems during the pandemic, the materials taught also experienced problems, especially science materials. This is the consequence of the characteristics of science as a collection of knowledge that encapsulates quality, observation and experimentation, prediction, progress, and communication as well as universality (Syamsuri, 2020, pp. 17–18; Nisa et al., 2022, p. 213).

Regarding science learning during the pandemic which was carried out online, the problems faced are increasingly complicated. Starting from the limited facilities and infrastructure, geographic conditions and internet availability, costs, and HR capabilities in mastering technology (Handayani, 2020, p. 169). The same thing happened to the writer who taught at SDN Wates, Wates District, Kediri Regency. However, this is a medium for writers who are also teachers to continue to reflect and improve themselves. Considering that science concepts can be obtained through a discovery process, a way is needed so that the subject matter provided during the Covid-19 pandemic provides space for students to remain active and creative even though the learning system is conducted online. On the other hand, teachers cannot always bring students to real field observations. In addition, there was the Covid-19 pandemic which also required educators to continue to work so that students do not lose their enthusiasm for learning at home. This is where the role of learning media according to Primasari, Zulfiani, and Herlanti serves to present direct experiences that students cannot reach directly (Primasari, Zulfiani, & Herlanti, 2014).

Following the characteristics of elementary school, the students who are around 6-12 years old, are in a concrete operational period so they need learning media to make it easier for them to understand the concept of science (Portanata, Lisa, & Awang, 2017, p. 340), especially on material that cannot be represented directly by the object, such as material from the human respiratory system (Nisa, 2023, p. 61). Moreover, based on PISA, Indonesia's children's science knowledge is still low, is shown that Indonesia is ranked 64th out of 65 countries taking the test (Dewi, Mariam, & Kelana, 2019, p. 236). This is an urgency for educators to improve science learning which is also able to make students active and creative even during the Covid-19 pandemic. In accordance with the basic competence of science class for the V grade in the 2013 curriculum, namely making a simple model of the human respiratory organ, the writer who is also a teacher at this school wrote a learning innovation paper entitled "Utilization of Balloon Breathing Stimulation Media Media (Breathing Balloon Simulation: A Way to Make Children Active and Creative) in Science Learning during the Covid-19 Pandemic (Research in Natural Science Learning for the 2020/2021 Academic

Year)". The practice of making media by students at home is expected to increase their activeness and creative thinking abilities. This is because students will not only stare at cellphone screens during distance learning, but they will also actively create media while simultaneously understanding the concept of the human respiratory system. The use of tools and materials in making the media "Balloon Breathing Stimulation Media" which is easily accessible to students at home, can improve students' creative thinking skills in designing their experiments with directions from the teacher via the Whatsapp group. Through this scientific writing, students can solve problems regarding the material of the human respiratory system because they learn through a concrete practicum. This also shows that doing a practicum actively can develop students' creative thinking skills (Mulyani, Leny, & Suharto, 2017, p. 89).

Methods

Qualitative descriptive research methods are used in this research method because the results of this study are the result of analysis and interpretation of learning outcomes before and after using learning. Data analysis used the method of observation, interviews, and learning outcomes at the end of the study.

Results and Discussion

The subject of this research trial was grade V Elementary School on theme 2 of the 2013 curriculum, namely clean air. Basic competence 4.2 i.e. "Creating a Simple Model of Human Respiratory Organs" is used in this activity. However, the indicators made by the author not only require students to be able to create a simple model of the human respiratory organ but also can explain how to make media and the working process of human respiratory organs by demonstrating it. All of these assignments are collected in the form of videos so that it appears that the nature of science as a process of scientific thinking is going well during the pandemic. Thus, students' creative thinking skills develop too because they try to create the concept of the human respiratory system in the form of concrete objects and in a language that is easy for them to understand.

Result

Based on the distance learning process that has been implemented, the results can be described as follows:

a. Creative Thinking Skills in Science Literacy for Elementary School Students.

Making media that is created at home has a real impact on students regarding their curiosity about the human respiratory system material. The media "Balloon Breathing Stimulation Media" makes them find out for themselves about the location and function of each human respiratory organ. Moreover, the task of demonstrating the media subtly forces them to master the science concepts being taught. This demonstration can develop students' creative thinking skills in explaining in detail the human respiratory system. They create it in spoken language which of course requires them to read the subject matter first. Based on the results of the description of the acquisition of scores for creative thinking skills, the percentage of each aspect was obtained, i.e.: the average acquisition on the aspect of fluency reached 82.85%, flexibility 71.4%, rationality 85.7%, and elaboration 80% (see attachment for details).

Thus, the use of the media "Balloon Breathing Stimulation Media" is proven able to improve students' creative thinking skills in learning science. This also represents the acquisition of students' scientific literacy. Cognitive, affective, and psychomotor aspects also improve along with the increase in creative thinking skills.

b. Motivation to Learn

The activity of making the media "Balloon Breathing Stimulation Media" increases students' interest in participating in learning at home. The Covid-19 pandemic, which requires them to linger in front of their cellphone screens, made them bored. With the activity of making this media, students learned to create ways to gain their understanding regarding the concept of the human respiratory system. The increase in student motivation was also reflected in the learning motivation questionnaire given by the teacher after the lesson is over. Meanwhile, the criteria for very good motivation reached 25 children and the criteria for good were 10 children (see attachment for details). Thus, it can be seen that the use of the media "Balloon Breathing Stimulation Media" which is carried out online increases students' learning motivation. The increase in learning motivation is also in line with the increase in creative thinking skills in elementary school science literacy. As found in Palupi's research, et al that creative thinking skills involve complex activities such as cognitive abilities, motivation, and other metacognitive skills (Palupi, Subiyantoro, Triyanto, & Rukayah, 2020; Nisa et al, 2019, p. 102). The distance learning plan made by the teacher determines the motivation of students in participating in learning at home. The stability of teacher preparation both in terms of innovation and content determines the success of the learning process at home that students participate in. Prananda and Hadiyanto said that the teacher is responsible for learning motivation and the learning process of students (Prananda & Hadiyanto, 2019, p. 910). This shows that a pandemic requires teachers to be able to create learning innovations that can increase students' learning motivation. The success that has been achieved from this learning shows that learning outcomes are influenced by motivation and active learning. The activity of making and demonstrating the media "Balloon Breathing Stimulation Media" directly increases the activity of students in the process of acquiring scientific literacy. This is reinforced by the results of the research by Tegeh, Pratiwi, and Simamora that there is a significant relationship between learning activity, motivation, and learning outcomes in grade V Elementary School Science (Tegeh et al., 2019, p. 150). In addition, the results of the research by Freitas, Cicuto, and Pazinato revealed that the majority of students were driven by intrinsic factors to learn scientific concepts harder (Freitas, Cicuto, & Pazinato, 2020, p. 359). This is also inseparable from collaboration with parents so that distance learning is carried out while still paying attention to the process of acquiring scientific literacy.

Discussion

Important value and novelty of the research carried out

a. **Role of Parents**

The role of parents is inseparable from the success that has been achieved in using the media "Balloon Breathing Stimulation Media" in controlling students' learning process at home. Parents contributed a lot to the success of learning activities during the Covid-19 pandemic (Trisnawati & Sugito, 2020). As known that almost all problems in the world of education always revolve around teachers, students, and the learning environment in schools. The Covid-19 pandemic forced parents or guardians of students at home to take a significant portion of the success of educators.

Not only were students required to understand the subject matter, but their parents were also forced to understand the material being taught because they supervised the learning process of students at home. It was not merely supervising students but helping them to understand the tasks given by the teacher to solve problems related to the subject matter. With the use of the media "Balloon Breathing Stimulation Media", this activity becomes a vehicle for parents and students to create a virtual laboratory, as stated by Vasiliadou who implemented a virtual laboratory for students during the Covid-19 pandemic. The research found that virtual laboratories allow students to conduct experiments in their homes according to their convenience. This opportunity is also very good to engage students with technology and in parallel avoid unexpected disruptions, as happened recently due to the covid-19 pandemic (Vasiliadou, 2020).

The description above shows that there is a novelty in students' science acquisition process. If in the normal situation before the Covid-19 pandemic the teacher was the actor who determined the enthusiasm for learning science, in this Covid-19 pandemic situation parents took the same portion as the teacher. Parents not only participate in preparing the tools and materials to make the media, but they also guide directly on how to assemble it as well as directing children to be able to explain the relationship between the media and the concept of the human respiratory system.

b. The scope of science is in the immediate environment of students

Distance learning implemented because of the Covid-19 pandemic does not eliminate the nature of science. The nature of science remains intact, obtained by students through the use of the media "Balloon Breathing Stimulation Media". As stated by Destya, et al, that science is not only the mastery of several knowledge in the form of facts, concepts, and principles but also the discovery process (Desstya, WR, & Azizunniza, 2019, p. 52). The activity of making "Balloon Breathing Stimulation Media" media develops students' creative thinking skills because they are trying to discover the concept of the human respiratory system for themselves. Tools and materials that are easy to find in the student's home environment show that learning science can be done anywhere according to the student's learning area. Even this activity involves three aspects of learning, namely cognitive, attitudinal, and

psychomotor. As stated by Syamsuri, the acquisition of science learning achievement involves all the potential of students, which are knowledge, attitudes, and skills (Syamsuri, 2020, p. 21).

The nature of science, which includes three aspects, i.e. processes, products, and attitudes, is a new challenge during the Covid-19 pandemic. Meanwhile, the scope of natural science as a process includes problem-solving procedures through scientific methods which are carried out by observation, preparation of hypotheses, experiments or investigations, and experiments (Khasanah & Sari, 2019, p. 368). With the use of the media "Balloon Breathing Stimulation Media", students get all the essence of science, namely their process from making media to collecting assignments in the form of videos. The media they make is also a product that they make themselves and study at home. This activity also fosters the attitude of students ranging from curiosity to high motivation in building the concept of the human respiratory system.

c. Teacher as Creative Model

21st-century learning that requires society to be able to face global challenges shows that creative thinking skills are needed (Aftriani et al., 2018). However, before focusing on improving students' creative thinking skills, it is far more important whether teacher pedagogy has been able to create learning that can face these global challenges, especially teacher innovation in distance learning due to Covid-19.

Concerning the above, the nature of natural science includes five aspects, namely quality, observation and experimentation, prediction/prediction, progressive and communication, and universality (Syamsuri, 2020, pp. 17–18; Nisa et al, 2022, p. 2). This is a challenge for teachers to create distance learning techniques that still cover these five aspects. Here the role of the teacher becomes a creative model for students. Soesilo said that there are four aspects of creative thinking skills, i.e. fluency thinking skills, flexibility thinking skills, rational thinking skills, and elaboration skills (Soesilo, 2014, pp. 36–40). Both teachers and students involve these four aspects in the applied distance learning innovations. This can be seen from the preparation of the teacher to prepare the innovation and the students then carry out the activities.

The teacher's fluent thinking skills could be seen in the way the teacher generated ideas related to the use of "Balloon Breathing Stimulation Media" media. Not only teachers, but students also showed fluency in generating answers and ideas in making and demonstrating the media "Balloon Breathing Stimulation Media". Rational thinking skills were shown too when the teacher gave directions through the Whatsapp group as well as the students demonstrated media. Flexibility thinking skills were also shown from the way the teacher connects objects around students' homes so that they can be utilized as science learning media. The flexibility of students' thinking can also be seen in the way they complete assignments from the teacher. The teacher's elaboration was displayed when providing media details including every

organ made in "Balloon Breathing Stimulation Media" media. The way students presented their videos and the media they created also showed their elaboration.

Supporting and Inhibiting Factors

1. Supporting Factors

The success of this learning innovation is inseparable from the support of the student's parents or guardians at home. Easy-to-find materials and tools make students not find it difficult to assemble them into a learning medium. Video tutorials provided by teachers are easy for students to understand so they have no difficulties having online learning. This is also in line with Trisnawari and Sugito's research which found that parental support during a pandemic in distance learning was able to increase children's enthusiasm (Trisnawati & Sugito, 2020, p. 830).

2. Inhibiting Factors

Although this learning innovation was considered successful in improving students' creative thinking skills in science learning, there were still factors that hindered the course of the activity, mainly the tools used to record videos during the process of making and demonstrating media. This was due to the type of cell phone owned by the parents of students. Thus, the videos collected by students were of low quality since they only used cell phone cameras and they did not understand the way to record good videos. Many of the videos collected by students lacked lighting and the point of view or angle to take the video because they did not capture all the objects. This caused the demonstration of the media "Balloon Breathing Stimulation Media" by students to be less in clarity.

Follow-up

Based on the learning activities carried out, there is a follow-up that is considered to be done to minimize the inhibiting factors that is the teacher gives directions and instructions at least two days before those students are asked to record the process of doing assignments in video form. In addition, the teacher also needs to give directions on how to record and edit videos so that the quality of the videos provided is good even though they only use the cell phone camera.

Conclusion

Based on the activity carried out and the analysis of its results, it can be concluded that the use of the media "Balloon Breathing Stimulation Media" in science learning is considerably effective in increasing students' creative thinking skills and learning motivation during the pandemic. Student activities such as assembling tools and materials into simple models involve their creative thinking skills. The four aspects involved in creative thinking skills are fluency, rationality, flexibility, and elaboration, representing students in acquiring scientific

literacy. This activity also provides a real picture of the scope of science which involves the environment around students both at school and at home.

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