Using Photovoice Method in Elementary Natural Science Learning

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ABSTRACT

The world and technology are constantly changing and developing rapidly. Every human being in various sectors is competing with each other to find new knowledge and new technology that can make human life easier. Various inter-sectoral collaborations have become a worthy and interesting finding to study because of their usefulness. One of them is the use of photographic techniques in the field of education which become a method called photovoice. The use of this method can be an alternative to learn natural sciences in elementary schools. Elementary school students are at the stage of cognitive development, namely the concrete operational stage that requires interaction with concrete objects that useful to form understanding. This is library research with a literature review method that aims to describe the meaning, benefits, method of implementation and photovoice assessment. So that later everyone can use it as learning method, especially in elementary natural science learning. Photovoice aims to gain insight because this activity is not just an activity of taking photos but also discussing them in group situations. Photovoice has many benefits which is suitable to master 21st century educational competencies, such as creativity, critical thinking, collaboration, and communication skills. Photovoice is implemented through group learning by taking photos or pictures, providing photo narration and presenting them. The photovoice assessment uses a rubric with five assessment aspects, including; specifications, composition, visuals, image quality and narration.

Keywords: Photovoice, Natural Science Learning, Elementary School

INTRODUCTION

Indonesia, with its abundant natural resources, has great potential that can support various fields of life. Indonesian human resources have a strategic role to implement the society 5.0. Era development demands the creation of highly competitive human resources. The Indonesian government has prepared various policies in the field of education to realize this ideal by updating the curriculum as time changes. For example, in primary education, especially in elementary schools, there has been a change in the curriculum from the 2013 Curriculum to the Independent Curriculum. Although changes to the implementation of the curriculum were carried out in stages, it proved that the government had shown seriousness to improve the quality of education.

Improving the quality of education is not only through the implementation of the curriculum but also through the innovation of various methods in learning. The current learning methods are expected to accommodate developments that occur. One of the innovations in the learning method is shown by the photovoice

method. Photovoice is a form of utilizing photographic techniques in the field of education. Wang & Burris (1997) stated that photovoice is a method for individuals to identify, represent and strengthen communities through photography techniques.

The current phenomenon where people are very close to cameras, especially cameras on mobile phone, has led to a good development trend through the photovoice method. People, both young and old, from all groups have the opportunity to record and become drivers of change in their communities. Especially with the increasingly widespread use of social media that displays photos and videos. Their skills are indirectly honed through their daily activities.

Taking pictures is a creative and fun process, where a picture taken can be worth more than a thousand words (Jemimi et al., 2022). Through the photovoice method, one can easily use photos/images that have been taken and then combined with words as a medium to convey certain intentions. This is certainly able to be an alternative learning method to teach in class.

Piaget has divided the stages of human cognitive development into four stages, namely sensorimotor (0-2 years), pre-operational (2-7 years), concrete operations (7-11 years) and formal operations (12 years to adulthood). Through Piaget's theory, it can be understood that learning media is needed to stimulate human thoughts and emotions, especially when he is under 12 years old (Batubara, 2021). The cognitive development of elementary school students is in the concrete operational to operational stages. At this stage, students can carry out many concrete tasks by developing three kinds of thinking operations, namely identification, negation and reproduction and some are already able to think abstractly and hypothetically (Sunarto & Hartono, 2013). Thus, learning in elementary schools should be managed by presenting real objects or direct experience to practice creativity and thinking skills.

Based on the results of the 2015 Program for International Student Assessment (PISA) survey, Indonesia was ranked 64 out of 72 countries with a score of 403. Likewise, the results of the two previous surveys held in 2009 and 2012, Indonesia was ranked at the bottom. This shows that Indonesian students' scores on scientific literacy skills are still far below the international standard scores set by the OECD institutions. The low science learning outcomes are thought to be related to the science learning process which has not provided opportunities for students to develop critical reasoning abilities (Yuliati, 2017).

In line with that, natural sciences in elementary schools is one of the compulsory subjects. Natural science lessons have a difficulty level that increases with the higher level of education. This causes natural science to be considered difficult by students (Susanto, 2013). The concept of science in elementary schools is integrated and has not been separated, which consists of; biology, physics, chemistry, and earth and space concepts. Natural science learning in elementary schools is actually meant to provide a basis for understanding science that is useful at the next level. Natural science learning prioritizes mastery of the natural science itself, namely learning science must go through a scientific process, produce scientific products by conducting experiments and forming a scientific attitude. Natural science is not always studied through experiments in the laboratory but in the open field or our environment (Rustaman et al., 2018). Because science learning cannot be mastered by memorization, students must carry out experiments and observations to form creativity and awareness to preserve nature later.

It was further explained (Batubara, 2021) that direct experiences can be designed by using the support of real objects, while experiences through images can be carried out by using visual or audio-visual media and abstract experiences can be designed by using symbolic visual media such as textbooks, symbols, and model that represents a concept. Photovoice which is done by giving meaning to pictures/photos is an innovative learning method that can be applied to learning natural science in elementary schools. This is due to the photovoice method, students learn to take photos that require creativity, students also practice expressing meaning through words related to an image or photo. Apart to practice creativity and thinking skills (Andina-Díaz, 2020), photovoice can be used to improve other learning outcomes in elementary schools. Through photovoice, children are invited to realize the values of life that are beneficial for their future from knowing nature, plants, animals, social life and cultural phenomena so that they can preserve their culture later (Satunama, 2019).

Related to this, Ekayanti & Setiawati (2023) through their research by using photovoice method in the class, showed that the environment care attitude of elementary school students has increased on the theme of ecology. It means that students have caring awareness to their environment. However, before using photovoice in elementary natural science learning, it is important to study about; the meaning, benefits, method of implementation and assessment of photovoice. The results of this study are expected to be useful to improve the quality of natural science learning in elementary schools by implementing innovations in learning methods, namely photovoice.

METHODS

This research is library research with a literature review method that aims to describe the meaning, benefits, method of implementation and photovoice assessment. Data collection was carried out by using documentation techniques through explore, collect and review library sources related to the application of photovoice in classroom learning. After collecting the library sources, especially form journal articles dan books, the researcher then interprets them and compiles the results and make interpretations in a systematic and structured manner. Data analysis was carried out through several stages and used Miles and Huberman Model, including; data reduction, data display, triangulation and conclusions drawing (Sugiyono, 2018). This library research used ways to increase persistence and source triangulation as a test for data validity.

RESULTS AND DISCUSSION

Definition of Photovoice

Before use the photovoice learning method, you should know first about the definition of photovoice. Wang & Burris (1997) stated photovoice as a method that used by individuals to identify, represent and strength the communities

through photography techniques. Through Palibroda et al. (2009) it can also be seen that photovoice is a combination of pictures and words to help express something that is needed, feared, valued, dreamed of and all kinds of ideas that humans know. Taking pictures is a creative and fun process and a picture is worth more than a thousand words (Jemimi et al., 2022). According to (Surata, 2013), photovoice comes from the word "photo" which means photo or image and "voice" which means sound or message. Based on this definition, it shows that the meaning of photovoice is a learning technique that combines techniques for

taking photos (photography) and delivering messages based on photos that have been taken. In Wikipedia (2023) another name for the photovoice method is mentioned, namely; participatory photography techniques or participatory visual methods. Photovoice could be the qualitative method in research and also classroom teaching (O'malley & Munsell, 2020).

Photovoice aims to make perception because this activity is not just an activity of taking photos but also discussing them in group situations. Based on these results, people will have an understanding that can make a difference to the person concerned. Photovoice has three main objectives: (1) to give people the opportunity to record and reflect on the strengths of the community, (2) to initiate critical dialogue and knowledge about community issues through large and small group discussions through photography and (3) to reach decision makers or policy (Wang & Burris, 1997). Based on this photovoice definition, it can be concluded that photovoice is a learning method that combines photo-taking techniques with delivering messages according to the photos that have been taken. Photovoice aims to increase awareness, perception and thinking skills through describe and discuss the photos.

Benefits of Implementing Photovoice

Surata (2013) stated that photovoice has many benefits because everyone is interested in photos or pictures. Therefore, learning with photo can take place in a pleasant atmosphere. Fun learning will certainly be meaningful learning that can motivate students to study hard and improve their learning outcomes. Sometimes through words or verbal language, the speaker's aim can be understood properly. While the surrounding environment has a different situation. Photovoice allows us to study student perceptions or perspectives on the surrounding environment (Surata, 2013). This is in line with Satunama (2019) which states that the photovoice approach is a communicative tool because it can convey a message not only through spoken or written language but also in visual language through photographs. So that, photovoice can also be an effective means of conveying messages or ideas.

In photovoice, photos are used as reference material to guide discussions and interviews in groups, with researchers, or both. Unlike traditional interviews, photovoice does not only rely on verbal but also non-verbal communication so photovoice is also useful for overcoming social barriers, culture and language in communication. In other words, photovoice can be implemented with participants regardless of age, education level, language, gender, race, class, disability and so on (Wikipedia, 2023). Photovoice is a learning method that is cross-border.

It was further stated that the photovoice method also plays a role in anticipating people who are usually weak in expressing opinions orally. In a sense, this method helps students who are less proficient in spoken language. Photos invite students to practice observing and explaining the objects that have been taken, so that this method becomes an alternative solution in the form of participatory communication (Satunama, 2019). Sari & Sultan (2022) had used photovoice in their classroom, because it could be used to explore students' emotion in write. Butschi & Hedderich (2021) also used photovoice to involve children of kindergarten age in participatory research, to demonstrate diversity in a context close to everyday life and to start conversations with the children about the topic. They used photographs taken by the children in their living environment.

21st century learning concern to observers and educational practitioners around the world (Suwono, 2017; Afandi & Sajidan, 2018). Mastery of competencies in 21st century education requires students to have; (1) critical thinking and problem solve-skills, (2) communication and collaboration skills, (3) creative and updating abilities, and (4) digital literacy (Afandi & Sajidan, 2018). The photovoice method is in line with efforts to master 21st century educational competencies. Through the photovoice method students can practice their ability to create or be creative and collaborate through taking pictures. In addition, the ability to think critically, solve problems, communicate can be trained by students through the activity of describing the photos that have been taken (Andina-Díaz, 2020; Juniarti et al., 2022). Thus, the application of the photovoice method is able to facilitate students in mastering 21st century educational competencies.

How to Implement Photovoice in Natural Science Learning

The learning method is a more operational way to be taken by the teacher so that learning materials and messages can be conveyed to students. In this case, the method functions to expedite the interaction process between teachers and students and makes it easier for students to gain learning experience during the learning process (Prihantini, 2021). Another definition was also put forward by Darmayanti et al., (2022) that the learning method is a method used to implement learning planning through real activities to achieve learning objectives. The method can also be interpreted as the teacher's way of conveying learning content to students so that students are able to achieve certain competencies.

In natural science learning, the method that is commonly applied is a learning method that is in accordance with the nature of science, namely through the scientific process to produce scientific products and foster students' scientific attitudes. Learning methods known to natural science teachers are; lectures, demonstrations, questions and answers, discussions, experiments, simulations, scientific studies, games, recitations. Some of the criteria that must be considered by science teachers in choosing natural science learning methods; methods should be in accordance with learning objectives, in accordance with learning psychology, in accordance with the allocation of time and available infrastructure and should be adapted to the teacher's ability to teach (Darmayanti et al., 2022). There are many researches about using photovoice in natural science learning. Photovoice allowed students to authentically inquire about local science, as well as the potential to generate change in their own community (Cook & Quigley, 2013), photovoice helped children to learn about, care about, and take action on climate change (Lam & Trott, 2022), the photovoice project allowed for student-driven inquiry that helped students connect individual experiences to global issues while deepening their content knowledge in environmental science class (Waters & Cook, 2020), photovoice can be considered in teaching about aspects related to health/care in Nursing students, in order to promote critical thinking of future agents for a change in health (Andina-Díaz, 2020), application of photovoice in natural science learning have a significant impact on the creativity of SMP Negeri 12 Denpasar' students (Angela Rendo et al., 2021), photovoice in biology learning can improve students' environmental awareness (Suhardi et al., 2019) and also naturalistic intelligence and problem-solving skills (Ekanara et al., 2023). Photovoice was effective to increase the environment care attitude of elementary school students on natural science learning (ecology) (Ekayanti & Setiawati, 2023).

The photovoice method, which is a collaboration between taking pictures and sending picture message. The criteria of photovoice can be seen below.

1) The purpose of learning science in elementary school is to find answers to natural phenomena that occur around them. Through the photovoice method, students are invited to cultivate curiosity and then develop the ability to think scientifically about the natural phenomena. Nature should thus be a part of children's everyday life (Adams et al., 2017).

2) The use of the photovoice method is also in accordance with the stage of students' cognitive development, namely the concrete operational stage, where students at this stage should be managed by presenting real objects or direct experience so that they can train creativity and thinking skills.

3) In terms of time allocation and infrastructure, the photovoice method is very possible to apply because it can use a tool that has been popular among the public, namely mobile phones. Aside from being a communication tool, mobile phone is currently developing as a documentation tool (photo or video).

4) The use of photovoice can train elementary school students to improve analytical and thinking skills which are expressed through words. Through photovoice students' perceptions or perspectives on the surrounding environment can be studied (Surata, 2013).

The photovoice method can be done by following the steps, i. g.:

1) Students are formed into groups consisting of 4 to 5 people.

2) Each group is given a topic according to the curriculum.

3) In groups, students take photos of the surrounding environment such as plants, animals or other assigned objects.

4) Photos then selected and arranged to match the assigned topic.

5) Write a narrative based on photos series that have been arranged.

6) Do presentation about it in front of the class (Surata, 2013; Jemimi et al., 2022).

Photovoice Assessment

Each aspect belongs to the learning outcomes requires a different assessment procedure. Photovoice is one of learning outcomes that uses a rubric. Rubric, namely an assessment guide that describes the criteria that teacher wants in assessing or giving levels of student work. Arends (2013) defines a rubric as a detailed description of each specific performance and the criteria to be used to evaluate it.

Based on O'malley & Munsell (2020), photovoice needs a rubric to grade assignment in classroom teaching. Photovoice is assessed based on a rubric using five (5) assessment aspects, including; specifications, composition, visuals, image quality and narration. The photovoice assessment rubric is as follows.

TABLE 1 /Photovoice Rubrics

	Below Standards	Minimum Standards	Proficient	Highly Proficient	Score (N/A)
Specification	Not according to the theme. Messages and images	Pretty true to the theme. Messages and images are	In accordance with the theme taken.	Very true to the theme. The images are good quality and the message	

	do not support each other.	appropriate, quiet relevant and can still be improved.	Between messages and images there is a fairly synergistic relationship.	conveyed is very relevant to the theme and image.
Composition	There is no clear subject, the composition of the pictures and writing is not good, and it is not balanced. There is no clear focus yet.	The subject is clear, the composition of the pictures and writing is quite good but there are repetitions and less variety. Focus is quite good, there are some annoying.	The subject is clear, the composition of the pictures and writing is good, balanced and quite varied. Good focus.	The subject is stated very clearly. There is a dominant highlight that becomes the focus. Varied, and creates visual interest
Visuals	Paying no attention to the composition, it does not make an emotional or intellectual impression	Shows the use of composition that is quite good, gives an emotional message that is sufficient.	Using effective composition, creates an emotional or intellectual response. There is a good artistic element.	Demonstrates originality, composition is effective, creates a strong emotional or intellectual response, and is artistically elicited.
Image Quality	The image is out of focus, the object referred to is not clear.	The image is slightly out of focus and distracting, the object being referred to is still confusing	Focus image, clarified with good technique. The object referred to is clear. And not confusing.	High quality images, very effective focus, understandable and artistic.
Narration	Words are confusing, messages are not understood, lots of spelling mistakes.	The words are quite clear but there are still things that interfere, the message is quite understanda	Words are clear, some are out of focus but not distracting, messages are understood	The words are clear, the focus is according to the theme, the message is easy to understand and creates motivation. Good spell.

	ble even though it is not focused. There are some spelling errors.	, spelling is good.

Source: Adaptation from Zelm (2012)

TABLE 2 /Photovoice Score List per Group

Groups	Rated Aspect					
	Specification	Composition	Visuals	Image Quality	Narration	Total Score
1						
2						
3						
4						
5						
Total Score						

Photovoice can be used as an alternative for learning, such as natural science in elementary schools. The use of photovoice as learning method in elementary natural science learning is still developed. But in the end, the introduction of the photovoice method in elementary natural science learning can add to the body of knowledge and understanding of learning methods in order to improve the quality of education at the elementary school level.

CONCLUSION

Photovoice is a learning method that combines techniques for taking photos (photography) and delivering messages based on photos. Photovoice aims to make perception because this activity is not just an activity of taking photos but also discussing them in group situations. Elementary natural science learning needs photovoice as the learning method, because its: (1) can cultivate and develop scientific thinking about nature, (2) suitable to cognitive development stage in elementary school, namely concrete operational stage, (3) easy and possible to apply by using mobile phones, (4) useful to elementary school students to improve analytical and thinking skills which are expressed through words. Photovoice has many benefits which is suitable to master 21st century educational competencies, such as creativity, critical thinking, collaboration, and communication skills. Photovoice can be applied through groups study by taking pictures/photos, providing photo narration and presenting them. As a learning method, photovoice needs a rubric to grade assignment. Photovoice is assessed based on a rubric using five assessment aspects, such as; specifications, composition, visuals, image quality and narration. This library research article is a review of the photovoice method and criticize why it can be used in elementary natural science learning, the related research is still rare and developed. So that, in the future it is hoped that this research can be more carried out.

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