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An Analysis of Teachers' Perceptions in Developing Elementary School Students' Creative Thinking through Science Learning Media

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Abstract. The research objective was to analyze teachers' perceptions in fostering elementary school students' creative thinking through science learning media. The data analysis was expected to help teachers find out science learning media in developing students' creative thinking skills that can be used in learning activities as a complement to books that have been used following the characteristics and the surrounding environment. The research method was qualitative research with data collection techniques conducted through interviews and questionnaires. The research subjects were 12 elementary school teachers who used science learning media to implement learning activities. The research results showed that students could use science learning media in developing creative thinking, but it had not been implemented optimally. Therefore, it was crucial to be able to develop it. In addition, the science learning media could be developed based on elementary school students' characteristics in the concrete operational stage and the scope of material related to the environment around students. Science learning media can be displayed in digital form to develop students' creative thinking.

Keywords: Creative Thinking, Teachers' Perception, Learning Media, Science, Elementary School.

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INTRODUCTION ~ In the 21st century, education is strongly influenced by technology and globalization, so people must concern about it and prepare themselves in the best way. The characteristics of 21st century education are also known as 4C, namely communication, creativity, critical thinking, and collaboration (Erdogan, 2019) as the primary skills in learning. Therefore, there was a need for innovation in education, especially for teachers and students who are actively preparing to face a new era in the 21st century (Göçen et al., 2020). In addition, creative thinking can be considered one of some critical competencies required in the 21st century (Ritter & Mostert, 2017).

Creative thinking is one of the essential skills to be developed. Creative thinking can help students during the implementation of learning activities to achieve the expected learning objectives. Creative thinking also can be implicitly related to observing and analyzing problems in the form of plans or ideas (Ritter & Mostert, 2017). It can formulate solutions or new knowledge that was not previously available. One sign of achieving learning objectives is that students can improve their creative thinking skills and then apply them in everyday life (Mahlianurrahman, 2017), such as through learning science. However, in reality, creative thinking skills have not been maximally developed, especially in elementary schools, due to the lack of direct student involvement during learning (Sofiatun Nisa & Suryanti, 2013) which can affect understanding the material.

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Science learning can be defined as learning natural phenomena. It is limited to the experience humans have with presenting specific ideas in nature; namely, science developed due to observation, experimentation, decision-making, and development activities theory (Amini, 2017; Astutik et al., 2018; Sujana, 2016). In science learning, teachers can use learning media based on the needs and students' characteristics related to their creative thinking.

In the teaching-learning process, teachers have an essential role in determining learning media that can be used to develop students' creative thinking in science learning according to the students' characteristics. In addition, learning activities will run effectively and successfully if the teacher can create learning media following the students' material and characteristics (Akrim, 2018). Thus, teachers must innovate and be more creative to design exciting and meaningful learning for students (Iasha et al., 2018) to develop their creative thinking in science learning. Students' characteristics can refer to the characteristics possessed by students, both in groups and individuals, that can be used as considerations in organizing and implementing learning activities. Elementary school students are included in the concrete operational stage. Students already have logical thinking skills but only on concrete objects (Budiningsih, 2015; Jamaris, 2015) and have not developed abstract things (Sagala, 2014). So, it is crucial to managing the class as well as possible.

Many other studies on students' creative thinking have been carried out (Batlolona et al., 2019; Fatmawati, 2016; Hu et al., 2016; Madyani et al., 2019; Muskita et al., 2020; Syahrin et al., 2019) to foster students' creative thinking. The research results convey essential information about students' creative thinking. In general, in learning science in elementary schools, teachers still use existing media. They have not paid too much attention to the students' critical thinking to develop their creative thinking. Learning media that can support learning activities are very diverse, both in text, images, sounds, etc. The teachers' role in determining science learning media is significant regarding students' creative thinking, which can help them understand the material being taught. Thus, using media during learning activities makes students motivated, actively involved physically and psychologically, and maximizes all five students' senses during learning activities (Fadhli, 2015). Thus, Ausubel (in Sagala, 2014) states that learning can be more meaningful and also Sahronih et al., (2019) state that teaching is not only about transferring knowledge but also contains the meaning of learning and can have affect to students' creative thinking.

Therefore, this research focused on analyzing teacher perceptions in fostering elementary school students' creative thinking through science learning media. The analysis carried out was expected to assist teachers in knowing the needs of science learning media in developing their creative thinking skills. Hopefully, the skills can be used in learning activities as complements to the students' books. Then, they can help students understand the material suitable for students' characteristics and learning environment. Furthermore, the research problems can be formulated as follows: 1. What are the

teachers' perceptions and roles in fostering elementary school students' creative thinking? 2. What is the role of science learning media in fostering elementary school students' creative thinking?

Science is one of the subjects that must be taught at every level of education, including at the elementary school level. Science is very closely related to daily life because it has some benefits, such as animal husbandry, agriculture, health, etc.

Science studies everything that has to do with the universe (van Uum et al., 2016) and everything in it. Science is a part of human life so that by studying science, there will be interactions between students and the surrounding environment (Maryani & Amalia, 2018). In addition, learning related to science can help study the environment and nature around and related to the knowledge that contains a collection of observations and research that explains what, why, and how a phenomenon occurs (Mokiwa & Msila, 2013). Thus, science can be said to be knowledge about nature and its events (Sujana, 2016) developed by experts based on scientific processes. In essence, science is a process, scientific attitude, and product.

In the implementation of learning activities, science is a subject that needs to be taught practically and precisely, not only involving memorization and reasoning but also carrying out activities and developing skills (Yeboah et al., 2019). Science is one of the subjects taught in elementary school. The implementation of science learning in elementary schools can not only train students' skills, but can also encourage students to understand and observe, so that what has been understood can be applied by students in everyday life. Science can occur in everyday life and often happens and is experienced by everyone. By carrying out science learning activities related to the universe, oneself, and events in the surrounding environment and daily life. Science learning given to students emphasizes the experiences experienced directly by students as well as practical activities that can develop students' competence and knowledge of the natural surroundings scientifically (B. Nugraheni et al., 2017). In addition, in carrying out science learning activities it is necessary to develop a learning that can actively involve students in the implementation of learning activities in order to find or apply ideas that arise from the students themselves. Learning that can develop students' ability to think critically and can provide direct experience is a learning that is carried out by linking science learning with the students' daily lives themselves (Trianto, 2013). Thus, the implementation of science learning must be able to actively involve students, because the implementation of science learning can be related to the daily lives of students and the surrounding environment which can affect the way students think to be able to better understand and understand the science learning being taught.

Creative Thinking

Creative thinking is a process of combining several abilities, such as the ability to see, understand, and produce something new such as ideas to solve an existing problem (Segundo Marcos et al., 2020; Wang, 2012; Ward et al., 1997).

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Guilford (1975) states that creative thinking combines two cognitive operations or thinking abilities: convergent and divergent thinking. Convergent thinking is a thought process in which information is organized logically to provide a firm solution to a problem. In contrast, divergent thinking is used in open-ended problems where prior knowledge generates alternative and logical responses. In addition, creative thinking is a person's self-development, through problem-solving ability in a unique way, full of benefits, and enhances self-quality (Munandar, 1999). In addition, Munandar (1999) provides a number of clearer descriptions of aspects of creative thinking, which are as follows.

Table 1. Aspects of Creative Thinking

Aspects	Behavior
Fluency	Ask a lot of questions; Answer with a number of answers if there are questions; Have many ideas about a problem; Fluent in using his ideas; Work faster and do more than other students; Quickly spot faults and weaknesses of an object or situation.
Flexybility	Provides a variety of unusual uses of an object; Provide various interpretations of an image, story or problem; Apply a concept or principle in different ways; Giving consideration or discussing something always has a different position or conflict with the majority of the group; If you are given a problem, you usually think of different ways to solve it; Classify things according to different divisions or categories; Able to change the direction of thinking spontaneously.
Originality	Thinking about problems or things that no one else has thought of; Questioning old ways and trying to think of new ones; Choose a-symmetry in creating an image or design; Looking for new approaches from stereotypes; After hearing or reading an idea, work towards a new solution.
Elaboration	Looking for a deeper meaning to the answer or problem solving by performing detailed steps; Develop/enrich the ideas of others; Trying to test the details to see which way to go; Has a strong sense of justice that is not satisfied with an empty/simple appearance; Adding lines/colors and details/sections to the image itself.

A person can be creative if he can solve a problem with his ideas and answers. There are four indicators of creative thinking behavior, namely fluency, flexybility, originality, and elaboration (Munandar, 2016).

Table 2. Indicators of Creative Thinking

Aspects	Explanation
Fluency	Generates many relevant ideas/answers, smooth flow of thought.
Flexybility	Generating ideas that are uniform, able to change ways or approaches, different directions of thought.
Originality	Give an unusual answer, different from the others, which many people rarely give.
Elaboration	Developing, adding, enriching an idea, detailing details, expanding an idea.

Learning Media

According to Sujana (2016), learning media can be interpreted as a tool that functions to convey messages or learning materials to students, which can be inanimate or living objects to make it easier for students to understand the message or content the material conveyed by the teacher. Learning media used appropriately in learning activities will be a more effective and efficient supporting tool in achieving the expected learning goals (Puspitarini & Hanif, 2019). It can be seen that learning media are beneficial and needed (Storksdieck, 2016).

In learning activities, in practice, people can use more than one medium. However, multimedia is more emphasized on learning media, focusing more on information and communication technology (Sujana, 2016). In relation to learning, it is known that students are increasingly learning based on materials that can be presented digitally such as digital textbooks, digital learning, educational applications and so on or can be called multimedia. Multimedia refers to the presentation of material in the form of text and images, such as digital science books that present models of scientific phenomena through text accompanied by dynamic visualizations such as simulations or series of images (Richter et al., 2016).

In addition, Mayer (in Ercan, 2014) states that the material from the multimedia used can be in the form of choices with text, images, as well as animations and videos that can facilitate learning. In addition, research on learning media has been carried out by Ercan (2014), which reported that multimedia was more effective in implementing science learning.

METHOD

The research used a descriptive qualitative method with a qualitative approach. The data was collected by combining and analyzing inductive data (Sugiyono, 2016). The qualitative research could produce data and processed the descriptive data through data obtained from interviews and questionnaires. Related to qualitative research's flexible and open characteristics, the design and data collection method in qualitative research can be very diverse, adapted to the problems, research objectives, and research object's characteristics.

Research Subject

The research subject is one of the essential components used in research activities. The research subject is a data source for further use as a research variable (Arikunto, 2017). The selection of the research subjects was conducted by analyzing the problem beforehand, which the researcher carried out at some elementary schools. After carrying out these analytical activities, twelve elementary school teachers were selected to learn activities using science learning media in Kuningan Regency, West Java Province.

Research Instrument

The instruments used in this study were interview guidelines and questionnaires. The interview guide grid and the instruments used were adopted from the research that had been previously carried out by Haxhihyseni (2015), which were as follows.

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Table 3. Interview Guidelines

Number	Aspect	Indicator
1	Creative Thinking	Basic perception Application Constraints
2	Learning Media	Types of learning media Learning media provided Coverage of learning media Constraints in use Teachers' efforts in fulfilling learning media Display of learning media Availability of other learning media

The interview guidelines could develop interview instruments for teachers to determine teacher perceptions in fostering elementary school students' creative thinking through science learning media. In addition, the research was carried out using an analytical questionnaire guided by a grid-based on research results (Haxhihyseni, 2015; Rosilia et al., 2020), as follow.

Table 4. Questionnaire Grid

Number	Indicator
1	Understanding of science learning on creative thinking
2	The need for mentors in learning
3	The use and the scope of students' books
4	Availability of supporting books
5	Other learning media needs
6	Interest in science learning media

These grids are then used as a guide in the questionnaire preparation. Some questions included (1) How many students actively ask many questions in the science learning activities? (2) Can students' creative thinking be developed through science learning media? There were 14 questions in the needs analysis questionnaire.

Research Procedure

The research was closely related to collecting data obtained from some data collection techniques to get some conclusions. Data collection in this research referred to the results of questionnaires and interviews carried out previously; therefore, some conclusions can be obtained.

Data Analysis

The data analysis used in this research was the Miles and Huberman model which cover data reduction, data display, and conclusing drawing/verification (Sugiyono, 2016).

In addition, the questionnaire analysis used the Guttman scale with some statements of opinion on a subject,

namely "agree" or "disagree" to several opinions submitted with a score of 1 for the "yes" answer and a score of 0 for the "no" answer (Widoyoko, 2012). The analytical technique used was the adjusted percentage based on Riduwan (2015), with the possibility of obtaining a percentage of each answer obtained by dividing the frequency on the number of samples then multiplied by 100, which was as follows.

Table 5. Guttman's Percentage Scale

Percentage	Category
0-1	Nothing
2-25	Small proportion
26-49	Less than half of
50	Half of
51-75	More than half
76-99	Most
100	Total

If the presentation shown from the results of the teachers' perception questionnaire exceeded 50%, it would be concluded that half of the teachers required science learning media to foster elementary school students' creative thinking.

RESULTS

Based on the results of previous research, it was known that students' creative thinking is generally interpreted as a process in learning activities carried out in a unique and new way by using science learning media. In addition, teachers need science learning media that have been available and used previously for students' creative thinking. It was in line with the results of a previous interview with classroom teachers who used science learning media in their learning activities, located in Kuningan Regency on June 19, 2021. They state that: (1) Science learning media used in learning activities were student books. Furthermore, there were some supporting books for teachers. (2) The learning media used were good, but the scope of the material was not entirely related to the environment around students to develop their creative thinking. (3) There were few variations of science learning media displayed related to students' creative thinking. (4) Students felt that using science learning media independently was challenging. (5) There were other science learning media used, namely supporting books.

From the discussion above, it was known that there were several shortcomings and obstacles in using science learning media, namely the scope and material presented that is not related to the environment around students, as well as variations in the appearance of learning media that can affect students' creative thinking. Through the research carried out, it is hoped that it can assist teachers in developing science learning media related to students' creative thinking, which could complement existing and previously used science learning media so that learning can run better and maximally following the applicable curriculum.

In addition to conducting interviews, a questionnaire was also carried out to analyze teacher perceptions in fostering

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students' creative thinking through science learning media to 12 teachers in Kuningan Regency. The questionnaire contained six indicators consisting of 14 questions, with each had a choice of answers in the form of "yes" and "no." The results of the analysis of questionnaires about teachers' perceptions were then shown with a description, which was as follows.

Understanding of Science Learning on Creative Thinking

The following was quantitative data related to learning science on students' creative thinking.

Graph 1. The results of filling out the teachers' perception questionnaire about understanding of science learning on creative thinking

The diagram showed that 12 teachers agreed that students' creative thinking could be developed through science learning media to implement learning activities. In addition, nine teachers stated that students had not actively asked many questions (fluency), eight teachers stated that students had not been able to provide various interpretations of the problems and learning media presented (flexybility), seven teachers stated that students in learning activities using science learning media do not yet have a different way of thinking than others (originality). Eight teachers stated that students in learning activities used science learning media that have not been able to develop ideas that have been put forward by others (elaboration). The data, when converted into a presentation form according to Riduwan (2015), showed a percentage of 100% for students' creative thinking development, 75% for difficulties in students' fluent thinking, 70% for difficulties in developing students' flexible thinking, 60% for difficulties in students' original thinking development, and 70% for difficulties in students' elaboration thinking development. From the percentage result, all teachers thought that students' creative thinking development could be done through science learning media. However, more than half of the teachers agreed that it had not been implemented optimally. Thus, other science learning media are still needed to develop students' creative thinking in learning activities that teachers can use.

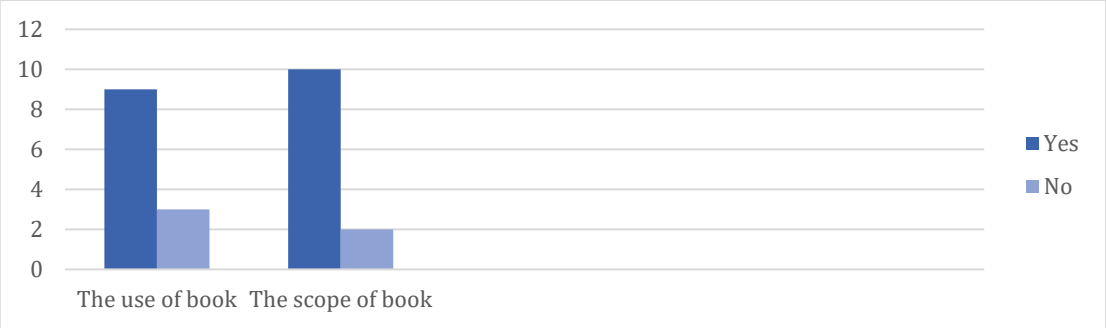
The Need for Mentors in Learning

When learning activities occur at school, the students' primary guide is the teacher, while parents and tutors are the central guides for students at home. Thus, a mentor is one of the critical aspects of learning activities. The following was quantitative data related to the needs of mentors in learning.

Graph 2. The results of filling out the teachers' perception questionnaire about the need for mentors in learning The diagram showed that nine teachers agreed about the need for mentors in learning for students. This data, when converted into a presentation form according to Riduwan (2015), showed a 75% percentage of the need for companions in learning and fell into the category of more than half of the teachers agreed that the need for mentors in learning for students was essential. It is also known that most of these students in learning activities still depend on mentors and cannot learn independently.

The Use and The Scope of Students' Books

Students' books are essential things during the implementation of learning activities. The following was quantitative data related to the use and scope of student books.

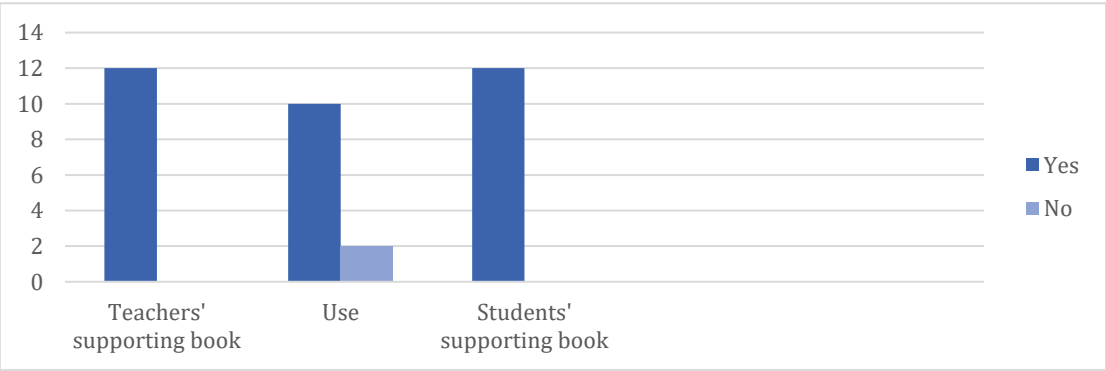


Graph 3. The results of filling out the teachers' perception questionnaire about the use and the scope of students' books

The diagram showed that nine teachers agreed on students' difficulties using books, and ten teachers agreed with the lack of material coverage. The data, if converted into a presentation form according to Riduwan (2015), showed a percentage of 75% who fell into the category of more than half agreeing that there were difficulties in using books by students independently and 83% who fell into the category of mostly agreeing to the lack of material scope on the subject students' books available.

Availability of Supporting Books

In implementing learning activities in schools, textbooks can guide both teachers and students. The Government usually provides them. Nevertheless, a supporting book that can support the use of the textbook was not in the same case. Teachers and students have to find the supporting books personally if they want to have and use the supporting book, which may not necessarily follow the characteristics and needs of learning. The following was quantitative data related to the availability of companion books.



Graph 4. The results of filling out the teachers' perception questionnaire about availability of supporting books

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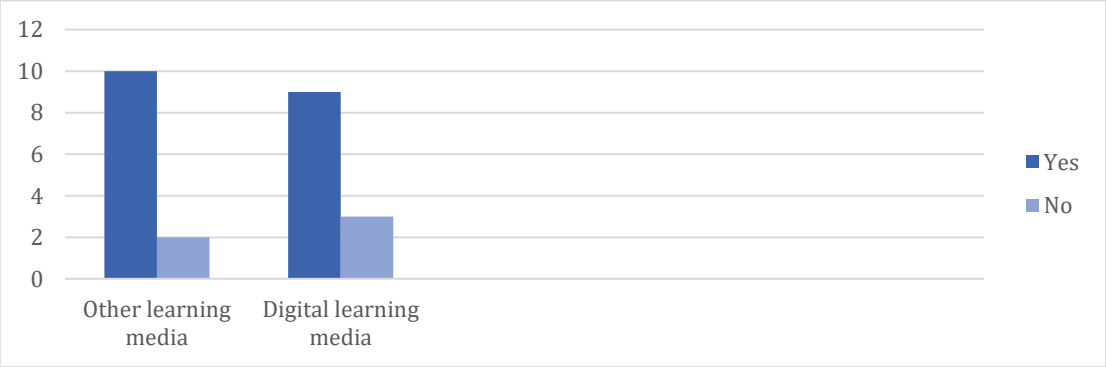
The data in the diagram showed that 12 teachers had supporting books. There were also supporting books for students, and ten teachers agreed that the use of the supporting books would not be optimal. The data, when converted into a presentation form according to Riduwan (2015), showed a percentage of 100% with the category of all teachers and students already having supporting books and 83% with the category of most teachers agreeing that supporting books had not been used optimally in learning activities.

Other Learning Media Needs

Learning resources can be interpreted as a system consisting of a collection of materials/situations that are collected intentionally and made so that students can learn (Prastowo, 2018), including the main book. The main books provided by the Government are student books with no other learning resources available that can be used as learning media in various forms and appearances. The following was quantitative data related to the needs of other learning media.



Graph 5. The results of filling out the teachers' perception questionnaire about other learning media needs

The diagram showed that ten teachers agreed on the need for other learning media, and nine teachers agreed on the need for digital learning media. The data, when converted into a presentation form according to Riduwan (2015), showed a percentage of 83% with the category of most teachers agreeing to students who are deemed to need other learning media and 75% with a category of more than half of teachers agreeing that digital learning media can facilitate science learning to develop students' creative thinking. From this statement, it can be seen that teachers need science learning media to develop students' creative thinking in the implementation of learning activities.

Interest in Science Learning Media

Learning media is one component that can influence the achievement of the expected learning objectives, such as the use of science learning media. The following was quantitative data related to interest in science learning media.

Graph 6. The results of filling out the teachers' perception questionnaire about interest in science learning media

The data in the diagram showed that ten teachers agreed that there was students' interest in science learning media. The data, when converted into a presentation form according to Riduwan (2015), showed a percentage of 83% for the students' interest. From the presentation results, it was included in the category that most teachers agreed with students who were interested in using science learning media during learning activities.

DISCUSSION

Teachers' Perception and Roles in Fostering Elementary School Students' Creative Thinking

Today, education is strongly influenced by advances in technology and globalization. Therefore, it is vital to follow the development of the education and possible by developing some skills. Creative thinking is one of the critical skills to be developed during the implementation of learning activities by teachers and students, where creative thinking can be said as a process of combining some abilities, including the ability to see, understand, and produce something new such as ideas to solve an existing problem (Segundo Marcos et al., 2020; Wang, 2012; Ward et al., 1997). Thus, the teacher has an essential role in developing students' creative thinking in implementing learning activities as well as possible.

The results of interviews with teachers showed that the importance of developing elementary school students' creative thinking, as stated by Ritter & Mostert (2017), is that creative thinking can be considered one of the critical competencies for now. The teacher's perception questionnaire results showed that the elementary school students' creative thinking development in learning activities had not been maximized. It is proved by being in the category of more than half of the teachers agreeing. Thus, it was vital to cultivate creative thinking to help students develop themselves through various activities carried out and solve problems in implementing learning activities by expressing new things different from the usual creativity. In line with this, Hidayat et al., (2018), argue that creative thinking can be said as a mental activity used to build and create new ideas widely and diversely. One of the things needed in developing students' creative thinking, one of which is through

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the teaching materials used in the implementation of learning activities.

Teaching materials are various materials in printed and non-printed forms, also various forms of tools and materials used by teachers to facilitate learning activities (Ina Mustafa & Efendi, 2016). Schools use the teaching materials that exist and nowadays are teaching materials from the Government. These teaching materials become a reference in implementing learning activities using the current curriculum, namely the 2013 curriculum. The Regulation of The Ministry of Education and Culture of Republic of Indonesia Number 11 of 2005 also states that textbooks are used as a mandatory reference by teachers and students during learning activities. Based on the teacher's perception analysis results, it was known that the available teaching materials in the form of books had been displayed well and attractively. However, the scope of the available materials has not been implemented optimally. The interview results were strengthened by 83%, with most of the teachers agreeing to the lack of material covered in the available student books. It is in line with research conducted by Dhinata (in Rosilia et al., 2020) that overall the books used during the implementation of learning activities by students and teachers can be said to be according to the current 2013 Curriculum still need some improvements.

The Role of Science Learning Media in Developing Creative Thinking Elementary School Students

Media during learning activities can be a component that can influence the achievement of the expected learning objectives. The learning media has an essential role in achieving success in the learning process (Fahmi, 2017). The use of media in the implementation of learning activities can make students more motivated to learn. Following the statement expressed by I. Nugraheni et al., (2019), motivated individuals or students focus on the importance of effort and perseverance in learning. The availability of media will also enable students to participate more actively in the implementation of learning activities. The questionnaire results showed that all teachers and students have already had supporting books as their learning media, and 83% with most teachers agreeing to the supporting books that have not been used optimally in learning activities. Therefore, it was crucial to develop these learning media. Students would be much more active than students who have never used learning media to implement learning activities (I. Nugraheni et al., 2019).

In addition, in the use of books as a medium in the implementation of learning activities, it is known that more than half of the teachers agree on the need for mentors in learning for students. In addition to this, it is essential to know that most of these students in learning activities are still dependent on their supervisors and have not learned independently, which can be presented by 75%. It is in line with Amirudin & Widiati, (2017) that implementing learning activities in the classroom can be carried out well and successfully achieve the expected learning objectives to manage the book as the learning media. One of the uses of learning media is in science learning.

Based on the analysis of interview results, the available science learning media were not too related to the environment around students, with presentations that were still in general. It was one of the obstacles in implementing these learning activities that had not been implemented optimally. By carrying out science, learning has some benefits, including studying the environment and nature around. The learning process was carried out well because of the interaction between humans and their environment (Akrim, 2018). Science is also science related to nature and the events that occur in it (Sujana, 2016) developed by experts based on scientific processes. In essence, science is a process, scientific attitude, and product. Moreover, science learning media displayed needs more attractive and varied displays. Based on the questionnaire result, it showed that a percentage of 83%, teachers agreed that students needed other learning media, and 75 % of teachers agreed that digital learning media developed could ease science learning in developing students' creative thinking. It is in line with Gynther (2016), which is digital-based learning with various interactive visualizations and simulations can affect quality improvement in learning, both in students' motivation and creative thinking. Then, technology can be classified as an inseparable part of life and has a positive effect on education, also creates opportunities such as science learning nowadays (Akgunduz & Akinoglu, 2016). The development of science learning media can carry out by paying attention to students' characteristics and their surrounding environments.

The Elementary School students' characteristics have included the concrete operational stage with the students who already have logical thinking skills, but it is only for concretes things (Budiningsih, 2015; Jamaris, 2015) and cannot develop abstract things (Sagala, 2014). The learning media can adapt to the characteristics of media users, namely students, where media has a role, and students possibly can get benefits from media (I. Nugraheni et al., 2019).

CONCLUSION

Based on the research results that have been conducted, it concluded that (1) Students' creative thinking can be developed using science learning media when learning activities occur. Hence, it has not been implemented optimally. (2) Science learning media can develop according to student characteristics, and material scopes can be related to the surrounding environment to develop students' creative thinking. (3) Science learning media used can be developed in a digital form to develop students' creative thinking. The research results will be used in the following research, namely developing a science learning media according to students' characteristics and material scopes related to students' environments, and it can be digitally displayed and is used in learning activities.

The alternative media in science learning can be a companion book with a more attractive and varied appearance. Learning media can be used as an alternative solution to develop students' creative thinking by teachers. A learning and other science learning media are suitable to characteristics and needs as a

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companion, and it will not eliminate the function of a book as science learning media as previously used. This science learning media will support to develop students' creative thinking and strengthen student understanding of the teaching material of a book as the existing science learning media.

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