



Improving the Reading Ability of Elementary School Students in Recognizing the Nutritional Content of Carrots Through the Use of Mind Map

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ABSTRACTS

Reading ability is a skill to gain knowledge and insight that will increase intelligence. At the elementary school level, it is still quite difficult to foster interest in reading, so that learning media is needed that can support teaching and learning activities. Thus, the purpose of this study was to determine the level of reading ability and understanding of elementary school students about the introduction of nutrients in carrots and the effect of using mind mapping on the learning process. The research method used is quantitative with data collection techniques through pre-test and post-test activities. The sample in this study amounted to 10 fifth-grade elementary school students. Based on the results of the pre-test and post-test activities on the introduction of the nutritional content of carrots using mind mapping, it showed a significant increase in students' reading and understanding abilities with an average increase of 74%. This shows that mind mapping can make the learning process fun and make students pay more attention. Based on the results of this study, it can be concluded that the use of mind mapping can help elementary students in improving their reading skills and understanding the relevant nutritional content of carrots.

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1. INTRODUCTION

The reading ability is an important aspect to supports the progress of the nation and determines the success of learning. Reading activities to improve children's knowledge and understanding is an effort that must be done continuously (Boliti, 2009). Lack of reading ability in children will affect children's psychology, such as low self-esteem, lack of confidence, and low motivation to learn (Ariyati, 2014). In elementary school students, improving reading skills is related to the ability to understand important things and capture the meaning of what they read (Tahmidaten & Krismanto, 2020). Along with growth, children will be at the stage of cognitive development where children begin to have diverse knowledge and skills (Trianingsih, 2016).

In cognitive development related to improving reading ability and knowledge, parents and teachers can provide education related to nutritional content, for example nutrition education in carrots. Providing education related to nutrition will be useful in increasing knowledge, forming positive attitudes towards nutritious food, and forming good eating habits (Herman *et al.*, 2020). Carrots are vegetables that are rarely liked by children because they are not too sweet and have a hard texture. The introduction of carrots needs to be done as early as possible to prevent children from becoming picky eaters. In the introduction of carrots, parents and teachers need appropriate learning media to improve children's reading skills and knowledge about carrots. One of the learning models that can be used is to use mind mapping. Mind mapping is an interesting learning media because it contains images, symbols, colors, and writing so that in its delivery children will feel comfortable and pay attention (Rahmatika *et al.*, 2019).

In the research conducted by Iis (2018) concluded that mind mapping is a way of placing information into the brain this is because the shape of a mind map resembles a map of a city street that has many branches (Iis, 2018). This is in accordance with the opinion of Firdaus (2010) who in his research stated that mind mapping is a diagram used to present words, ideas, and other things related to a word that contains the main idea (Firdaus, 2010). In reading activities, children tend to feel bored and lazy to understand the contents of the reading delivered by the teacher and prefer to play alone or chat with friends. Learning that uses mind mapping in teaching and learning activities will run well because mind mapping can activate and balance the two functions of the brain (Nugraha *et al.*, 2016). This is in accordance with the opinion of Karim (2016) which states that the use of mind maps can help the child's brain in re-understanding the ideas conveyed thoroughly in a material or learning topic (Karim, 2016). In addition, the use of pictures, colors, lines, and words related to learning materials can foster student interest in reading, increase creativity, and make students interested in being directly involved in the learning process (Indriyani *et al.*, 2018). Therefore, the use of mind maps can overcome problems related to reading and understanding the topics taught. This was also agreed by other researchers who explained that mind mapping can be used in children's cognitive development towards understanding and reading the material presented by the teacher (Rahmatika *et al.*, 2019).

In the statement of the problem, the purpose of this study is to determine the level of reading ability of elementary school students in their understanding of the nutritional content in carrots through the use of mind mapping. With a quantitative method, this research was directed to fifth-grade elementary school students. In the research process, the instruments used were pre-test and post-test which contained ten questions regarding the nutritional content of carrots. The results of the pre-test and post-test activities were used as a

comparison before and after the use of mind mapping in helping students improve their reading and understanding skills related to the nutritional content of carrots.

2. THEORETICAL FRAMEWORK

2.1. Mind mapping

Mind mapping is a technique popularized by Tony Buzan in 1970. Mind mapping is a thinking alternative that uses the whole brain to linear thinking with visual images and graphic infrastructure to form an impression. The use of mind maps is a creative way of making notes as shown in **Figure 1**. This is because in a mind map there are lines, symbols, words, and pictures, based on a simple set of rules, fundamental, natural, and familiar to the brain (Anggraini *et al.*, 2016).

In mind mapping, the shapes and topics in the mind map will vary depending on the way the maker thinks. However, in making a mind map some conditions must be done so that the mind map can be called "good", namely, it must contain images, use various colors, there is a connector/link between the main idea and the subject to be explained, and only contains a few words from the topic which will be explained only (Firdaus, 2010).

2.2. Carrot

Carrot (*Daucus Carota L.*) is a type of tuber that grows upright with a height of 30-100 cm depending on the variety. **Figure 2** explains the structure of the carrot which consists of leaves, stalks, and roots (carrot tubers). Carrot is rich in beta carotene which is good for eye health, especially to prevent blindness. The content of beta carotene in carrots is in the range of 60-120 mg/100 g (Ardyanti *et al.*, 2020). In addition to this content, carrots also contain vitamin C, vitamin K, fiber, protein, carbohydrates, and fat (Masriani, 2019). **Table 1** shows the nutritional value of 100g of carrot according to the USDA (United States Department of Agriculture).

In the body, Beta carotene in carrots can act as antioxidants that are efficacious to improve body health and inhibit aging. In addition, beta carotene which is converted into vitamin A can help vision, prevent night blindness, accelerate wound healing, repair skin, and eliminate toxins in the body (Triastuti *et al.*, 2017). Carrot has various types, namely the Emperor type which has an elliptical shape and a pointed tip like a cone, the Chantenay type which has a round shape and a blunt tip, and the Nantes type which has a combination of the two previous types which are round and short or round and slightly long (Ghozaly & Safitri, 2016). In life, Carrot can be processed into various kinds of processed products or healthy food ingredients depending on the processing technique carried out, one example is juice, healthy noodles, nuggets, carrot flour, instant carrot juice, carrot fermented drinks, carrot crackers, churros, and many others (Pramudya *et al.*, 2021).

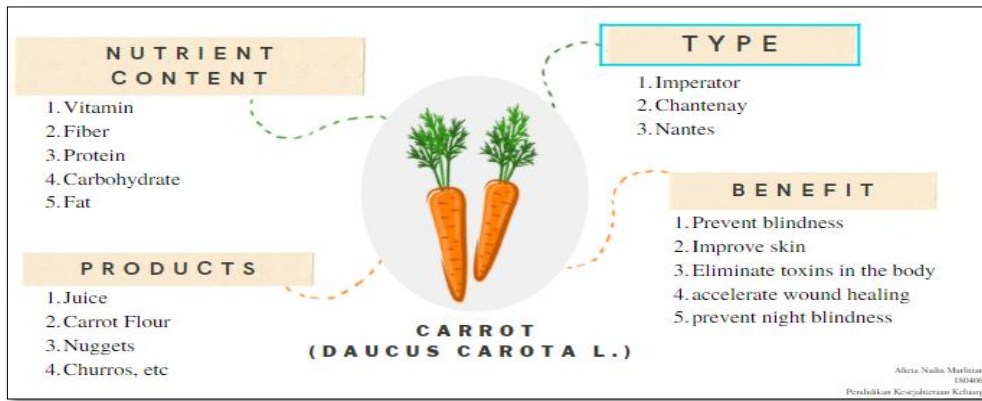


Figure 1. Mind mapping.

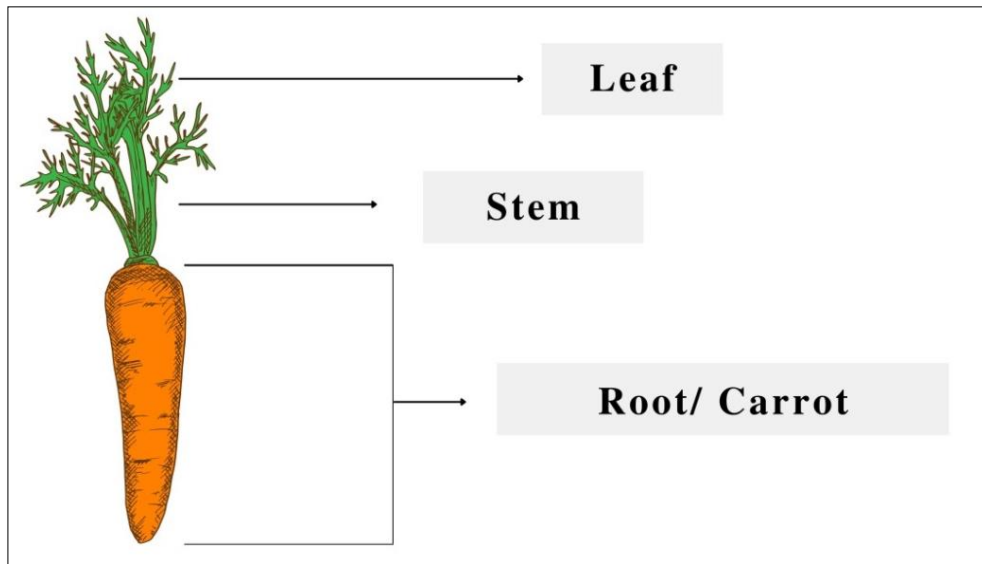


Figure 2. Structure carrot.

Table 1. Nutritional content per 100g carrot.

Nutrient Content	Volume	
Edible part	95	%
Water	90.1	g
Protein	0.81	g
Fat	0.24	g
Carbohydrate	9.58	g
Dietary fiber	2.8	g
Energy	3.1	g
Vitamin A	16,706	IU
Vitamin K	15	g
Vitamin C	2.2	mg
Na	66	mg
K	210	mg
Fe	0.43	mg
P	31	mg
Niacin	0.465	mg
Zn	0.28	mg

3. METHOD

This study uses quantitative methods accompanied by library research activities from previous studies. This type of research includes a pre-experiment using a one-group pre-test post-test design (Lasari & Iqbal, 2020). **Figure 3** illustrates the research flow. This study focuses on the introduction of nutritional content in carrots given through the use of mind mapping. The subjects to be studied were ten fifth-grade elementary school students from one of the elementary schools in Sukabumi. The level of students' reading ability and comprehension was evaluated through ten questions with yes and no answers. The analysis score for answering yes is 10 and no is 0 for a total score of 100 (if students answer all questions yes, the maximum score is 100). Gain-normalization analysis was conducted to determine the increase in students' reading ability in the pre-test and post-test activities with the following formula:

$$N - gain = \frac{\text{posttest score} - \text{pretest score}}{\text{max. score} - \text{pretest score}}$$

Table 2 describes questions about the introduction of nutritional content in carrots. **Table 3** describes the criteria for assessing students' reading ability and understanding in identifying the nutritional content of carrots through the use of mind maps.

4. RESULTS AND DISCUSSION

4.1. Demographics

The subjects in this study were fifth-grade elementary school students with a population of 29 students. The samples taken in this study amounted to ten samples. In this study, the majority of respondents were in the city of Sukabumi with various places of the residence adjacent to the school. The demographic data of the respondents in this study included the gender and age of the respondents. The age distribution of respondents is in the age range of 9-11 years, while the distribution of data on the gender of respondents with a percentage of 45% of respondents is male and 55% of respondents is female.

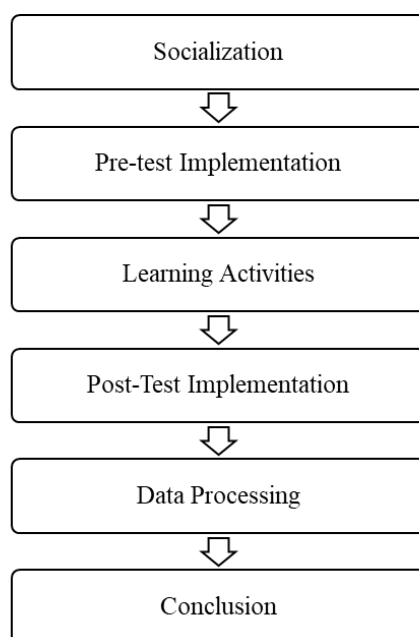


Figure 3. Method framework.

Table 2. Questions regarding the introduction of nutritional content in carrots.

No	Question	Answer	
		Yes	No
1.	Do you know carrots?		
2.	Do you know the scientific name of the carrot?		
3.	Did you know that carrots are tubers?		
4.	Did you know that carrots grow in the ground?		
5.	Do you know the structure of the carrot?		
6.	Do you know the nutritional content in carrots?		
7.	Do you know the greatest nutritional content of carrots?		
8.	Do you know the benefits of eating carrots?		
9.	Do you know the varieties of carrots?		
10.	Do you know any food/drink made from carrots?		

Table 3. Criteria for assessment of reading and understanding ability.

N-gain	Criteria
$n\text{-gain} < 0,30$	Low
$0,70 > n\text{-gain} \geq 0,30$	Average
$n\text{-gain} \geq 0,70$	high

4.2. Pre-test and post-test result

Table 4 describes the pre-test and post-test scores with n-gain and the criteria for students' understanding of learning using mind mapping. This research was conducted by giving ten short multiple-choice questions to elementary school students to confirm their reading ability and understanding of the introduction of nutritional content in carrots. The results of the pre-test and post-test will be compared as a result of the teaching process before and after the provision of material related to the nutritional content of carrots with the help of a mind map. **Figure 4** describes the comparison between the pre-test and post-test scores which shows that learning activities using mind mapping can help students improve their reading and understanding skills related to the nutritional content of carrots.

4.3. Result discussion

Based on the results of the study, it can be concluded that mind maps have a positive effect on the ability to read and understand fifth-grade elementary school students to introduce the nutritional content of carrots in the learning process. Based on the results of the pre-test activity, it can be concluded that many students do not understand the nutritional content of carrots. This can be seen from the average pre-test score of 51, which indicates that students do not understand the nutritional content of carrots. However, after being given lectures using mind mapping related to the nutritional content of carrots, students experienced a significant increase, as evidenced by the value of post-test activities with an average value of 84. Based on the normalized n-gain analysis, it was seen that 4 students were in the high category while 6 other students are in the moderate criteria with an average n-gain of 0.74 or 74%, which means that students' reading and understanding abilities are in the high category. From the data above, it can be concluded that learning activities using mind mapping media are considered quite effective because they can affect reading skills and increase students' understanding of the material being taught. This is in line with previous research which explains that the use of mind maps can have a positive impact on the understanding and reading ability of elementary school students (Rostikawati, 2017).

5. CONCLUSION

The ability to read in children can be influenced by the learning media used during the teaching and learning process. Based on the results of research that has been carried out, information is obtained that mind mapping can improve children's reading and understanding skills with a significant increase in the introduction of nutritional content in carrots. This can be seen from the average subject is in the high criteria with a value of 74%. This explains that the use of mind mapping in the learning process can make students pay more attention and improve their ability to understand lessons.

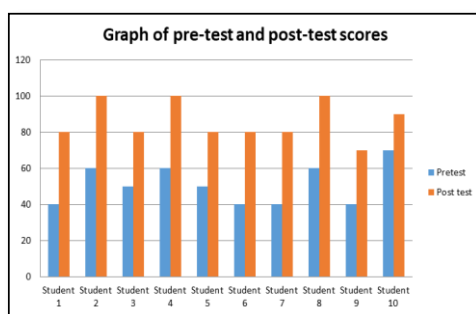


Figure 4. Graph of pre-test and post-test scores.

Table 4. Result pre-test and post-test.

Student's Name	Pretest	Post-test	N-Gain	Criteria
Student 1	40	80	0.67	High
Student 2	60	100	1.00	High
Student 3	50	80	0.60	Average
Student 4	60	100	1.00	High
Student 5	50	80	0.60	Average
Student 6	40	80	0.67	Average
Student 7	40	80	0.67	Average
Student 8	60	100	1.00	High
Student 9	40	70	0.50	Average
Student 10	70	90	0.67	Average
Average	51	84	0.74	High

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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