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## Analysis of the Making Questions Ability of Respiratory and Its Function on Elementary School Students in Bandar Lampung City

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### Abstract

One of the scientific approach activities is asking questions but not every student is actively asking questions which can trigger curiosity about learning. This study aims to measure the making questions ability of fifth-grade elementary school students in the city of Bandar Lampung on the subject matter of respiratory organs and functions in animals and humans. This descriptive survey research used a multistage cluster sampling area combined with the stratification. The design of this research is cross-sectional. The type of data in this study is quantitative data obtained by measuring the ability of students in making questions and the results will be interpreted in the form of a percentage which is then categorized based on the category of students' ability in making questions. The making questions ability of students in this study can be measured according to the indicators of assessing the quality of the questions. The results of the calculation of the data that have been obtained show that the ability of grade V elementary school students in making questions is in high category with a final percentage of 70.97%. The results of quality of student questions based on 4 indicators obtained the percentage from the highest to the lowest, which is 24.6% on the focus indicator, 17.1% on the grammar indicator, 15.6% on the relevance indicator, and 13.6% on the cognitive level indicator. The cognitive level is influenced by age and level of education, grammar is influenced by the limited vocabulary factor that is owned. It can be concluded that the difficult to arrange questions with good and correct vocabulary relevance with influenced of students' inability to think more critically and deeply so it is difficult for them to make questions that are relevant to everyday life or other fields of science and the focus is influenced by interesting learning media and interactive learning methods.

**Keywords:** making questions ability; quality of questions; respiratory material

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## INTRODUCTION

The 21<sup>st</sup> century has entered the era of globalization and has experienced the development of advanced and sophisticated science and technology. This means that human resources are required to have the ability as well as the skills to think critically, problems solving, collaborate, and adapt. This demand requires a solution that can help or at least initiate the emergence of these abilities and skills. Education is one of the government's efforts to anticipate this condition.

The abilities of students can be seen on results of the PISA (Program for International Student Assessment) and TIMSS (Trends in International Mathematics and Sciences Study) study in 2018, show that the science ability score obtained by students in Indonesia is 396 and is ranked 70<sup>th</sup>. Besides, the TIMSS survey results in 2015 show that the science ability score obtained by students in Indonesia is 397 and is ranked 45<sup>th</sup> out of 48 countries (Hadi et al., 2018).

The reasons for Indonesia getting low PISA scores include (1) the limited ability of students to express thoughts in writing, (2) students reading accuracy is still low, students are not used to connecting information in the text to be able to answer questions, (3) students' weak mastery of the basic concepts of science and their relation to everyday life (Pertiwi, Atanti, & Ismawati, 2018).

The basic concepts of science can be learned through a scientific approach. The scientific approach is learning that is centered on students which includes observing, asking, trying, associating, communicating (Kemendikbud, 2013). One of material at the elementary level is respiratory organs and their functions in animals and humans, can be learned using this approach. This material is easy related to everyday life and experienced by students at the elementary level.

One of the important activities of the scientific approach is questioning, associating, and communicating. Questions arise when a student has curiosity, from this curiosity then students will try to find answers to questions by collecting various sources of information, and then conclude answers to problems found by them in everyday life. All these things can be realized when teachers apply the scientific approach. Therefore, it is important to conduct a study to obtain information of elementary students' abilities in communicating their thoughts in the form of questions.

The level of the intellectual development of individuals aged 6-12 years is at a concrete operational stage. Children at this age can think systematically to achieve concrete solutions to problems (Ibda, 2015). Besides, children can think logically, understand conversational concepts, organize objects into classifications, and be able to remember, understand and solve concrete problems. At the age of 9-11 years is the age of elementary school (Nadratushalihah, 2012). In this period the child achieves high objectivity. This period can also be called the period where the child begins to investigate, trial and experiment which is stimulated by strong urges and curiosity.

Elementary school students' interest in solving a concrete problem will certainly cause curiosity to arise in them, this curiosity can be manifested in the form of questions, but it turns out that Indonesian students are still shy about expressing their curiosity. This is in line with some of the results of research conducted by previous research by (Widodo, Sumiati, & Setiawati, 2006) which was carried out with 3 cycles of students had been given more concrete directions to ask questions, the results showed that students who ask questions verbally are few and if they are not given a special opportunity to ask, students do not ask questions, therefore in their lessons they are allowed to write their questions. After being allowed specifically to write down the questions it turned out that they could come up with a lot of questions. This result is similar with previous studies that students rarely want to ask orally in class, but if allowed to write down their questions, they can come up with many questions (Chin & Chia, 2004). Further research was carried out in Bulak district, during the learning process there are still many students who find difficult to ask or answer because they are embarrassed and afraid to answer (Prayitno, Sulistyawati, & Wardani, 2016).

Based on the 21<sup>st</sup> ability, PISA and TIMSS result, questioning as important activity in scientific approach, and there is no similar research about making question ability in elementary level in Lampung, this study is important to carried out. This study analyses making questions ability on ten State Elementary School students in Bandar Lampung in the learning material of Respiratory Organs and their Functions in Animals and Humans. This research describe making question ability based on the factor and cognitive level.

## METHOD

This research was conducted in the odd semester of the 2020/2021 school year in Public Elementary Schools in Bandar Lampung City. The population in this study were Public Elementary Schools in Bandar Lampung City, while the sample of this study were 10 State Elementary Schools which were grouped based on accreditation and spread over 5 sub-districts in the city of Bandar Lampung.

The sample was determined based on the cluster sampling area multistage combined with stratification techniques to obtain 10 samples of State Elementary Schools in the city of Bandar Lampung. The samples are located on Tanjung Senang, Labuhan Dalam, Way Dadi, Harapan Jaya, Beringin Raya, Kemiling Permai, Pahoman, Kupang Raya, Gulak Galik.

The design used in this study was a cross-sectional descriptive survey. The type of data used in this research is quantitative data. The quantitative data in this research is the score of the students' questions. The question score is then named question quality or ability to make questions.

The question quality assessment instrument in this study refers to the question quality rubric (Pramudiyanti, et al, 2019). The indicators for assessing the quality of the question are: (1) cognitive level as listed in Bloom's taxonomy (levels C1 to C6), then (2) standard grammar that should be used to make questions, then (3) students focus on the concept being studied, and (4) question relevance made against the concept of lessons that are being studied by students. Each indicator has a minimum value of 1 and a maximum of 2. The score obtained is converted by dividing by the maximum number, which is 8 then multiplied by 100. The number obtained is adjusted to the quality category of the question. Another instrument is the observation sheet for the implementation of learning in the form of an observation sheet.

The data were analyzed using the percentage descriptive analysis referred to quantitative data into percentages to be interpreted based on high, medium, low, and very low categories. The procedure of this research is briefly explained that learning is carried out online using the whatsapp platform. After learning is complete students are asked to write one question on paper and send it via whatsapp. Besides, observation of the implementation of learning is carried out by observing learning

activities. The activities observed were: a) application of learning methods; b) learning media; c) providing motivation; d) attract focus attention; e) giving a positive response; f) giving assignments; g) delivery of learning reflections. This activity is carried out on the subject matter of Respiratory Organs and Their Functions in Animals and Humans.

## RESULTS AND DISCUSSION

Based on the results of observations learning process, three aspects are categorized as high, which are the application of interactive learning methods, assignments, and the use of interesting learning media with a percentage of 100%. Some aspects are low category with a percentage of 50%, which are aspects of providing motivation and focusing the attention of students. The percentage distribution every school related to online learning on the subject matter of respiratory organs and their functions in animals and humans in all schools has a percentage value of 68.75% which is categorized as medium.

Nine schools use whatsapp learning application and one school uses zoom meeting and google form. The instructional media presented by the teacher to students using books in which there are pictures and videos about the respiratory system on youtube. The form of assignments given by the teacher to students is objective questions or essays in printed books, or questions made by the teacher on google form, besides that the teacher also provides questions from learning videos given by the teachers.

All schools have not provided the opportunity to ask students questions, motivation, focus student attention, give positive responses to students who ask questions, and convey reflections on the learning that has taken place. The results of making questions ability are presented in Table 1. The question quality of students is categorized as high, with the highest quality score being 76.25 at SDN 2 Labuhan Dalam. This shows that the cognitive level of students is quite good because the ability to ask students is influenced by their cognitive level, if it is dominated by the C1 level, the category is moderate with quality and quantity in the low category (Zuraida, Syamsu, & Tanjung, 2019).

Teachers choose to use the WhatsApp application to interact with students because this application has advantages including being able to create groups members, this helps teachers to be able to add all their students into class groups,

another advantage is that they can send files, pictures, voice messages, videos, GPS, web posts or links, emojis and so on. A useful feature for teachers and students during the online learning process, another advantage that this application has is that in WhatsApp text messages, bold, italic, and underline features can also be used which are very useful, for example, for affirming words and affirming certain terms (Amal, 2019). The use of Whatsapp in learning should be equipped with material, not just giving assignments, because it can increase student interest and achievement (Ratnasari, Ponoarjo., & Utami, 2020). Therefore, to comply student needs, learning can also be carried out face-to-face as well as using Zoom.

Zoom application can help the implementation of online learning because it can facilitate video-based online learning that supports two-way interaction between teachers and students that is easy to use, effective, and video and audio quality can be maintained even though the internet connection is unstable, the security of recordings made on when the meeting takes place, it will be more awake (Brahma, 2020).

Choosing the right online learning support application will create a good learning atmosphere that will foster interest and curiosity of students so they will be able to make good quality questions, which of course these questions will focus on the material being taught.

The second factor that influences the high percentage acquisition on the "focus" indicator is

the subject matter of the respiratory organs is the use of interesting learning media by teachers for students. These factors are in the "high" category with a percentage of 100%. Asking is a verbal expression that asks for a response from someone that can be in the form of knowledge to things that are the result of consideration so that students become the focus for responding to learning (Rahmawaty & Arsyad, 2020).

Based on the results of observations made with class V science teachers, learning media in the form of books in which there are pictures and videos about the respiratory system on youtube are suitable for use when teaching elementary school students because they are a visual because can help visualize things that are abstract into things that are concrete. In practice, the use of visual media is mostly used by students aged 7-13 years. Students who are still at the elementary school level are not able to think abstractly so that the material being taught needs to be visualized in a real form. In this way, it can help children in the process of internalizing various knowledge taught by the teacher in the learning process (Suda, 2013), for example, during learning, the teacher displays a picture that shows the parts of organs in the respiratory system of animals or humans. This material can be taught using a guided inquiry model that can facilitate effective communication, including questioning skills (Amiasih, Santosa, & Dwiastuti, 2017). Thus, the selection of the right learning media and model is needed.

**Table 1. Distribution of the quality of student questions in several State Elementary Schools (SD) in Bandar Lampung City**

No	Name of Schools	Indicator				Total Score	%	Quality of Questions
		A	B	C	D			
1	SDN 1 Tanjung Senang BDL	10	11	20	10	51	63.75%	High
2	SDN 2 Labuhan Dalam BDL	14	16	18	13	61	76.25%	
3	SDN 1 Way Dadi BDL	13	16	22	13	64	72.72%	
4	SDN 1 Harapan Jaya BDL	17	21	33	21	92	67.64%	
5	SDN 1 Beringin Raya BDL	19	21	34	19	93	68.38%	
6	SDN 2 Kemiling Permai BDL	11	16	20	11	58	72.50%	
7	SDN 1 Pahoman BDL	10	12	20	18	60	75%	
8	SDN 2 Pahoman BDL	10	14	20	14	58	72.50%	
9	SDN 1 Kupang Raya BDL	11	14	20	14	59	72.50%	
10	SDN 1 Gulak Galik BDL	11	17	20	10	58	72.50%	
<b>Sum</b>		<b>126</b>	<b>158</b>	<b>227</b>	<b>143</b>	<b>654</b>		
<b>Percentage of Each Indicator</b>		<b>54.78 %</b>	<b>68.69 %</b>	<b>98.69 %</b>	<b>62.17 %</b>			
<b>Percentage of Ability to Make Questions</b>		<b>70.97%</b>						
<b>Category Creating Questions</b>		<b>High</b>						

Note: A = Cognitive level (C1-C6) based on Bloom's revised taxonomy B = grammar; C = Focus; D = Relevance.

The quality of the questions based on the indicators obtained several percentage differences (Table 2). This difference is thought to be influenced by several factors, for example,

the cognitive level indicator has a lower percentage than the focus indicator. The low percentage obtained on the indicators of the cognitive level is influenced by age levels, children certainly have different abilities both in the ability to reason, think logically, remember, memorize, understanding and analyze. Children's cognitive abilities will increase every time (Bujuri, 2018). This cognitive ability can occur because it is influenced by several factors, such as brain volume, food, education, experience, and the environment but, in the context of cognitive development of a process, the most influential factors are experience and environmental factors. As stated by Piaget, active humans continuously make adjustment in the process of their interactions with the environment (Bujuri, 2018).

Another indicator that gets a lower percentage is focus. Children who are still in elementary school only have limited vocabulary, namely vocabulary that is often used in daily activities (daily activity) and are likely to be heard by them often. They have not been able to use high scientific vocabulary or those that are rarely used in daily activities, so it is difficult for them to compile the vocabulary according to good and correct Indonesian grammar rules (Bujuri, 2018).

The relevance indicator also has a low percentage compared to the focus indicator. The low percentage obtained is because students sometimes tend to be fixated on the material taught by the teacher only so that many of them are less able to think more critically and deeply to better understand the material being taught. The impact causes them to be less able to make

questions that relate knowledge from the material being studied with everyday life or with other fields of science. Other factors that influence questioning skills are interest, curiosity, teacher, and learning environment. A learning environment that is not monotonous can motivate students to ask and answer questions, and respect the opinions of others (Noprah, 2017).

Based on the data on Table 2, indicator A (cognitive level based on revised Bloom's taxonomy) more students get a score of 1, this means that more questions made by students are at the cognitive level C1-C3, then on indicator B (grammar), more students got a score of 1 as well, this means that there are still many students who write questions using poor grammar. Furthermore, for indicator C (focus) more students got a score of 2 so this means that the questions made by students have focused on the depth of the subject matter of the respiratory organs and their functions in animals and humans and the last indicator is indicator D (relevance), at This indicator is more students who get a score of 1. This means that more questions made by students are less relevant because of the inability of students to think more critically to make questions that are related to the material being studied with other fields of science and with daily life. Thus, question and answer activities can generate student curiosity, interest, and attention on a topic being discussed, and also can diagnose learning difficulties during the learning process (Sukriyatun, 2016).

**Table 2. Percentage Per Indicator for Assessing the Quality of Student Questions**

No	Name of Schools	% Each Indicators							
		A		B		C		D	
		1	2	1	2	1	2	1	2
1	SDN 1 Tanjung Senang BDL	100	0	90	10	0	100	100	0
2	SDN 2 Labuhan Dalam BDL	60	40	40	60	20	80	70	30
3	SDN 1 Way Dadi BDL	81.81	9.09	54.54	45.45	0	100	81.81	9.09
4	SDN 1 Harapan Jaya BDL	100	0	76.47	23.52	5.88	94.11	76.47	23.52
5	SDN 1 Beringin Raya BDL	90	10	60	40	0	100	60	40
6	SDN 2 Kemiling Permai BDL	90	10	30	70	0	100	100	0
7	SDN 1 Pahoman BDL	88.23	11.76	76.47	23.52	0	100	88.23	11.76
8	SDN 2 Pahoman BDL	90	10	40	60	0	100	90	10
9	SDN 1 Kupang Raya BDL	100	0	80	20	0	100	20	80
10	SDN 1 Gulak Galik BDL	100	0	60	40	0	100	60	40

Note: A = Cognitive level based on Bloom's revised taxonomy; B = grammar; C = Focus; D = Relevance

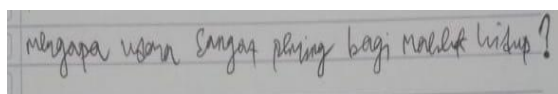
Based on the assessment of the quality of the questions seen from the indicators of the cognitive level, the sample questions in Figure 1 are included in questions that are classified as

high-level cognitive questions at the C4 level. The cognitive level is the level of the thinking process in each starting from the lowest level to the highest level. These questions are classified into

C4 level questions because they require elementary students to think about analyzing, to answer this question elementary students need to break down information into several parts to find assumptions, distinguish opinions and facts and find causal relationships. This question requires understanding the meaning of breathing, what are the uses of breathing, and what if not breathing so that breathing is important for the survival of a living being.

The sample questions in Figure 1 include questions with a good grammar. Grammar is the rules that govern the use of a good and correct language structure to be used as a benchmark in using language. This grammar is important to use so the questions made can be conveyed clearly. This question has good grammar because this question starts with a capital letter, there is a question word "Why" and there is a question mark at the end of the question.

The questions in Figure 1 include the relevant questions. Relevant is the relationship between one thing and another, namely questions related to everyday life or questions related to other fields of science. This question is relevant because it links knowledge between the subject matter being studied with everyday life, which is asking the importance of air for living things. The questions in Figure 1 also include questions that focus on the material being taught because these questions ask things that are by the material being taught, namely respiratory organs in animals and humans. Even though the skill of making questions can be further optimized by understanding the arrangement of the order of questions and systematically making questions based on higher order thinking skills (Indriyani, 2019).

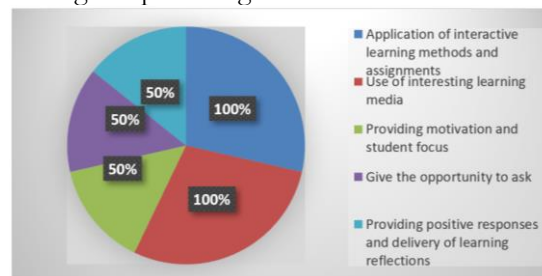


**Figure 1. Example of a Question that is Assessed from the Quality of the Question: "Why is air is so important for living things?"**

The implementation of online learning on the subject matter of respiratory organs and their functions in animals and humans may affect the quality of the questions made by students. The relationship between the two is illustrated in the following diagram on Figure 2.

Most of the online lessons on the subject matter of respiratory organs and their functions in animals and humans are in medium category

(Figure 2) which means that teachers need to further improve the quality of learning. implementation of learning that takes place can be expected to affect the quality of student questions. As many as 3 out of 4 indicators of the quality of student questions, namely indicators of cognitive level, grammar, and relevance, obtained a lower percentage. Only the focus indicator gets the highest percentage.



**Figure 2. Diagram observation result of online learning on the subject matter of Respiratory Organs and Their Functions in Animals and Humans with the quality value of student questions.**

The focus indicator has the highest percentage at 24.6%. This means that most of the questions written by students have focused on the depth of respiratory material and its function in animals and humans. This can be influenced by several factors, such as the application of interactive learning methods by the teacher, the use of interesting learning media, and assignments that are given.

The first factor that affects the high percentage of the focus indicator is the application of interactive learning methods by the teacher. This factor is high category with a percentage of 100%. This is following the results of observations with fifth grade science teachers related to the learning process carried out online on the subject matter of respiratory organs and their functions in animals and humans. Even though learning is done online, teachers find ways to still be able to interact with students, such as by using the WhatsApp application to create class groups.

The second factor can increase students' understanding of the topic is learning process. It will spur interest and curiosity in him to ask questions of good quality which of course these questions will focus on the material being taught. Science learning with practicum activities can be a solution to increase interaction between teachers and students as part of direct questioning skills so as to improve students' critical thinking skills (Norhasanah, 2018). In online learning, students should be given the

opportunity to ask and answer questions in discussions, teachers must also provide fast and accurate responses so that students get direct feedback (Susilowati, 2020).

The third factor that influences the high percentage acquisition of the focus indicator is the subject matter of the respiratory organs and their function in animals and humans is the assignment of tasks. Giving tasks to students will certainly have a positive impact on them, especially if the assignment relates to the knowledge that has been learned and is also very important. They are interested in it, it will make them more excited and this knowledge will be remembered longer by them, besides that students have opportunity to develop, have the courage to take the initiative, and be responsible to themselves (Winarno, 1986).

Giving assignments to students will make them understand more about the topic being studied, make students more enthusiastic, active, responsible for themselves and dare to take the initiative so that students will be more trained to be actively involved when learning takes place. By making quality questions which of course these questions will focus on the material being taught.

Also, there are other aspects, which are providing motivation, the aspect of allowing asking questions, the aspect of focusing student attention, giving positive responses and delivering learning reflections, getting a percentage of 50% which is categorized as low because the teachers do not provide motivation, does not provide opportunities for students to ask questions, not trying to focus the attention of students by asking them to pay attention to friends who are asking and not giving positive responses to students who have asked.

Assignments has an impact on the activeness of students in asking questions. There are only few students who actively participate in making questions related to material about the respiratory system, but this does not affect the quality of questions made by students because it only affects the number of questions from participants. Students and teachers have implemented online learning methods that are facilitated by several applications and have also used appropriate learning media which of course has a positive impact that arouses interest and curiosity in them.

## CONCLUSION

Based on the descriptions it can be concluded that the average making questions

ability of grade fifth grade elementary school students in Bandar Lampung on the subject matter of respiratory has high quality. It is necessary to follow up on the implementation of learning in the aspects of focusing attention, providing motivation, and providing the opportunity to ask questions to further investigate the impact on the quality of indicator questions.

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