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Analysis of Students' Higher Order Thinking Skills (HOTS) in Natural Science Subjects Class V Elementary School

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Abstract

Higher order thinking skills include critical thinking, creative thinking, problem solving, and decision making. Therefore, the difficulty that is often felt by students in developing higher order thinking skills is the difficulty in solving problems and making decisions. This research was conducted to determine the students' higher order thinking ability in the subjects of Natural Sciences (IPA) in elementary schools. The method used in this research is descriptive with a qualitative approach, namely to describe qualitative higher-order thinking skills. Data collection techniques using analysis of observations, interviews, and documentation of the results of the evaluation of science questions. The data that has been collected is then analyzed using a qualitative descriptive method. The results showed that students' high-order thinking skills in science subjects at SD Negeri 76 Palembang were included in the low category, from the evaluation results obtained an index of the percentage of students in three categories, namely, the good category was 10% with a frequency of 2 students , the less category was 20%. with a frequency of 4 students and a very poor category of 70% with a frequency of 70% of the overall HOTS indicators. So it can be concluded that students' higher-order thinking skills are still in the low category, so it needs to be further developed by strengthening students' understanding of higher-order thinking skills at levels C4 and C5. the good category was 10% with a frequency of 2 students, the less category was 20%. with a frequency of 4 students and a very poor category of 70% with a frequency of 70% of the overall HOTS indicators. So it can be concluded that students' higher-order thinking skills are still in the low category, so it needs to be further developed by strengthening students' understanding of higher-order thinking skills at levels C4 and C5. the good category was 10% with a frequency of 2 students, the less category was 20%. with a frequency of 4 students and a very poor category of 70% with a frequency of 70% of the overall HOTS indicators. So it can be concluded that students' higher-order thinking skills are still in the low category, so it needs to be further developed by strengthening students' understanding of higher-order thinking skills at levels C4 and C5.

Keywords:Higher Order Thinking Skills (HOTS); Science; Elementary School

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Keywords: Higher Order Thinking Ability (HOTS); IPA; Primary school

PRELIMINARY

The introduction is written in capital letters, 1 space apart and in bold. The introduction should contain the background of the problem; hypothesis (if any), research objectives and methods, introduction refers to several literatures that form the basis of theory or research reasons.

The implementation of the 2013 curriculum aims to improve the quality of education in order to be able to be competitive in facing challenges in the industrial era 4.0, resulting in a glorious 2045 golden generation in terms of knowledge, attitudes, and skills. The implementation of the 2013 curriculum is carried out in order to respond to the demands of an increasingly competitive era (Apandi, 2018, p. 40). This means that the 2013 curriculum is aspired to be able to give birth to intelligent future generations with intellectual abilities or thinking skills such as memory skills and problem solving abilities.

Ernawati (2017, pp. 189-201) states that the experience of solving complex problems requires Higher Order Thinking Skills (HOTS). Permendikbud No. 81 of 2013 concerning the implementation of the 2013 curriculum, explains that future competency needs require the ability to think critically, communicatively, and creatively. This is in accordance with the characteristics of the skills of 21st century society, where the learning process must be able to develop students' higher-order thinking skills in competing.

Natural Sciences (IPA) in the 2013 curriculum is one of the subjects that has an important role in developing all aspects of students' abilities in the learning process. According to Susanto (2013, p. 167), science is an effort made by humans to understand the universe which is carried out through the observation stage, using a procedure, and explained using reasoning.

The scope of science subject matter in elementary schools includes: Body and the Five Senses, Plants and Animals, Nature and Forms of Surrounding Objects, the Universe and Its Appearance, External Forms of Animals and Plants, Life Cycle of Living Creatures, Reproduction of Plants, Forms of Objects, Force and Motion, Forms and Sources of Energy, Alternatives, Appearance of the Earth and Its Changes, Environment, Universe and Natural Resources, Climate and Weather, Skeletons and Organs of Human and Animal Bodies, Food, Food Chain, and Ecosystem Balance, Reproduction of Living Things , Adaptation of Living Beings to the Environment, Health and Human Respiratory System, Changes and Properties of Matter, Conduction of Heat, Electricity and Magnetism, Solar System, Mixtures and Solutions.

Based on the results of an evaluation conducted by world organizations in education that assesses the development of education in the world, PISA (Program for International Student Assessment) by the OECD (Organization for Economic Co-operation and Development) examines students' thinking skills, which are followed by several countries including Indonesia. . Based on data from PISA 2012, Indonesia was ranked 64th out of 65 participating countries with an average acquisition value of the children's scientific literacy component of 382 (OECD, 2014, p. 5). Furthermore, Ramadhan (2018, pp. 86-90) explained that the evaluations carried out by TIMSS (Trends in International Mathematics and Science Study) and PIRLS (Progress in International Reading Literacy Study) in 2015 showed the same thing, Indonesia was in the ranked 45th out of 56 TIMSS participating countries.

Based on the results of initial observations in class V SD Negeri 76 Palembang, it can be seen that HOTS-based learning in science subjects has been implemented. However, this online learning indirectly affects students' learning absorption which has an impact on students' higher-order thinking skills, because the learning process carried out is not in accordance with the characteristics of HOTS-based learning. To implement HOTS-based learning, teachers need to pay attention to the learning process and evaluation questions. In terms of evaluation questions, HOTS learning requires teachers to apply assessments that are able to measure the extent to which students' higher-order thinking skills are so that students can improve their cognitive abilities in solving problems. If students' higher order thinking skills are known,

There are previous studies that support the above problems, such as the relevant research conducted by Oktyas Wahyu Kurniawati (2020). The results showed that the students' higher-order thinking skills in the natural science material for the fifth grade ecosystem theme in elementary schools were included in the low category. The low ability to think in higher order is influenced by understanding the concept of ecosystem material leading to students who experience not understanding the concept of ecosystem. Furthermore, research conducted by Arrofa Acesta (2020). The results showed that the daily science evaluation questions showed that the questions that stimulated higher-order thinking skills and lower-order thinking skills from the research data could conclude that science questions for developing HOTS were still low. Furthermore, research conducted by Gilang Ramadhan (2018). The results showed that the profile of high-level thinking skills of high school students in Cilacap Regency on material concepts and quantum phenomena was included in the low category. Based on the background of the problems listed above, the researchers tried to conduct a research with the title Analysis of Students' Higher Order Thinking Skills (HOTS) in Science Subject Class V at SD Negeri 76 Palembang.

The research method used in this research is descriptive qualitative. Qualitative descriptive research is research that is used to describe a situation scientifically (Masyhud, 2016, p. 104). The purpose of this study was to describe the higher order thinking skills of students in the fifth grade science subjects in elementary schools.

RESEARCH METHODS

This research was conducted at SD Negeri 76 Palembang, this study aims to determine the level of thinking ability of students in science subjects for single substance and mixed substances in fifth grade students of SD Negeri 76 Palembang. This research was conducted on April 28 to May 3, 2021 by making observations on April 28-29 2021, interviews on May 3, 2021 and tests on April 30, 2021.

The type of research used is descriptive qualitative research, in this study what is described using words is the high-order thinking ability of students in science subjects in grade V elementary school for single and mixed substances. The object of this research was selected based on a purposive sampling technique that is, based on certain considerations.

Lincoln and Guba (Jailani, 2020:20-23) state that the importance of providing reliable research guarantees has credible attributes. Credible means that the researcher is trusted to have collected data in the field. Therefore, so that the data in this study can be accounted for as scientific research, it is necessary to test the validity of the data: test the credibility of the data or the trustworthiness of qualitative research data consisting of extending observations, increasing persistence, triangulation, negative case analysis, using references and member checks. In this study, the triangulation used by the researcher is source triangulation and technique triangulation

Data collection methods used are observation, interviews, and documentation (evaluation results). Data analysis techniques in this study are: data reduction, data presentation, and drawing conclusions. Data analysis techniques in this study can be measured based on the results of student evaluations of higher order thinking skills

obtained by students. Furthermore, students are divided into 3 categories, namely high, medium, and low. The division is obtained based on the value obtained from the results of the high-level thinking ability test of students in science subjects. The formula used to calculate the percentage in certain categories can be seen below:

P = $\frac{F}{N}$ x 100% (Arikunto, 2014:60)

Information:
P = Percentage sought
F = Frequency
N = Number of students

RESULTS AND DISCUSSION

This study discusses the results of the analysis of the higher order thinking skills of students in science subjects, the data taken in the form of qualitative data. This research was conducted at SD Negeri 76 Palembang, which is located on Jalan KHA. Wahid Hasyim 5 Ulu Darat Lrg. Canal 1 Palembang, South Sumatra. The data in this study were obtained from the results of observations, interviews with classroom teachers and students, and documentation data (evaluation results) conducted by grade VA students at SD Negeri 76 Palembang. After the researchers collected data, then the data obtained would be analyzed to determine the level of students' high-order thinking skills in the natural science subjects of single and mixed substances in fifth grade students of SD Negeri 76 Palembang.

From the recapitulation data of the evaluation results, it can be seen that the average value of students' higher-order thinking skills is 7.5 or is included in the low category with a maximum average value of 20. Students are divided into 3 categories, namely high, medium, and low. The division is obtained based on the value obtained from the results of the high-level thinking ability test of students in science subjects

Table 1
High Level Thinking Ability of Students

| Evaluation result	Category	Total students	Percentage
80-100	Very good	-	-
66-79	Well	2	10%
56-65	Enough	-	-
46-55	Not enough	4	20%
< 45	Very less	14	70%

(Source: Data processed by researchers, 2021)

Based on the table above, it can be seen that the level of high-order thinking skills of students in the good category is 10% with a frequency of 2 students, the less category is 20% with a frequency of 4 students and in the very poor category is 70% with a frequency of 14 students. .

For more details, the results of the answers of class VA students can be seen based on the graph as follows:

Graph 1
HOTS Ability of Science Subject Students
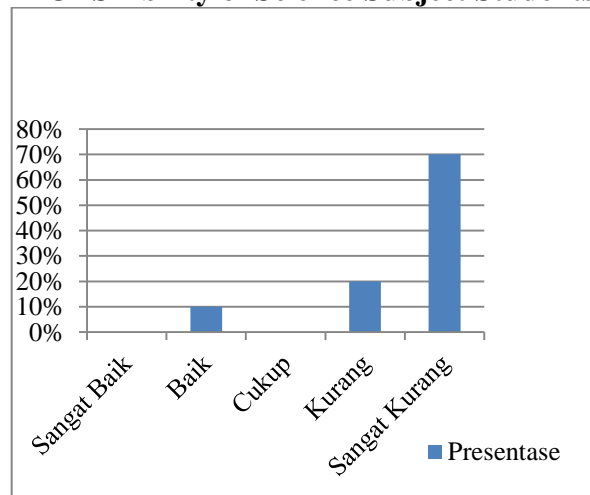
Based on the results of the evaluation, the level of students' higher order thinking skills in science subjects can be recapitulated based on the following indicators:

Table 2
Recapitulation of Evaluation Results of Students' HOTS Ability Analysis in Science Subjects Based on Indicators

No	Indicators of Evaluation Questions	No Question	Score	Maximum Score	Percentage (%)
1.	Analyze (C4)	4,6,7,9,11,14,17,18,19	73	180	40.56%
2.	Evaluate (C5)	1,2,3,5,8,10,12,13,15,	88	220	40%

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Based on table 2, it can be seen that the percentage of students in the analyzing indicator (C4) is 40.56% with a total score of 73 from a maximum score of 180, while the evaluating indicator (C5) is 40% with a total score of 88 students from the maximum score. 220, this shows that the ability to analyze and evaluate grade VA students at SD Negeri 76 Palembang is still in the low category.

Furthermore, from the results of the analysis of observational data conducted in class VA SD Negeri 76 Palembang, it can be analyzed that the process of teaching and learning activities at SD Negeri 76 Palembang is still not in accordance with the characteristics of HOTS-based learning, this causes students to not be able to develop higher-order thinking skills that already exist. they had before, while based on the results of data analysis of interviews conducted with teachers and students, it was concluded that the ineffectiveness of online learning and the strategies used by teachers in delivering the material caused students to have difficulty in receiving the material and the teacher's lack of understanding about HOTS-based learning itself.

The low level of high-level thinking skills of students is caused by the ineffectiveness of the learning methods used and the material presented by the teacher is not clear, resulting in students having difficulty in developing the higher-order thinking skills they already had. As stated by Rusman (Helmawati, 2019: 182), that in order to achieve success in learning activities, there are several components that can support, namely components of objectives, materials, teaching and learning strategies, and evaluation components. The four components must be considered by the teacher in selecting and determining what learning models will be used in learning activities. Besides that, The teacher's lack of understanding about HOTS-based learning also causes students' higher-order thinking skills to be low because teachers only focus on transferring knowledge, as emphasized by

Helmawati (2019:152), that teachers should have a comprehensive (holistic) understanding of the implementation of teaching and learning. . In this digital era, learning is not only focused on the transfer of knowledge. The point is that students are not only given a lot of material to know, but learning must also be focused on achieving quality thinking and action so that students are able to solve the problems they face in their lives so that learning becomes more meaningful. that teachers should have a comprehensive (holistic) understanding of the implementation of teaching and learning. In this digital era, learning is not only focused on the transfer of knowledge. The point is that students are not only given a lot of material to know, but learning must also be focused on achieving quality thinking and action so that students are able to solve the problems they face in their lives so that learning becomes more meaningful. that teachers should have a comprehensive (holistic) understanding of the implementation of teaching and learning. In this digital era, learning is not only focused on the transfer of knowledge. The point is that students are not only given a lot of material to know, but learning must also be focused on achieving quality thinking and action so that students are able to solve the problems they face in their lives so that learning becomes more meaningful.

CONCLUSION

Based on the observation data obtained in class VA SD Negeri 76 Palembang, it can be analyzed that the process of teaching and learning activities at SD Negeri 76 Palembang is still not in accordance with the characteristics of HOTS-based learning, this causes students to not be able to develop higher-order thinking skills that they already had. . Meanwhile, from the interview data conducted with the fifth grade teacher and VA grade students, it can be concluded that online learning is very influential on students' learning absorption which has an impact on students' higher order thinking skills because the learning carried out is not effective and meaningful. This certainly affects the students' higher order thinking skills.

The results of these observations and interviews are evidenced by the results of the documentation data on the evaluation of students' higher-order thinking skills in science subjects for class VA which are still in the low category. From the evaluation documentation obtained from the VA class teacher, the results obtained are the percentage in the low category of 70% of the frequency of 14 students, the medium category of 20% of the frequency of 4 students, and the high category of 10% of the frequency of 2 students. Furthermore, from the observation data, it was found that the low level of higher-order thinking skills of students was motivated by the ineffectiveness of the learning methods used and the material presented by the teacher was not clear, resulting in difficulties for students in developing higher-order thinking skills.

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