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Implementation of Digital Media in Improving Higher Order Thinking Skills (Hots) in IPAS Subjects

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Abstract

The purpose of this study is to improve students' understanding in HOTS-based science learning on the material "Hearing Because of Sound". The type of research used in this study is Case Study and Field Observation. The development used in this study is the Classroom Action Research Model (CAR). Data collection techniques used in this study are interviews and tests. The data analysis techniques used are quantitative and qualitative data analysis techniques. The results of the study show that students have shown an increase in understanding of the material "Hearing Because of Sound" in the science subject. This can be seen based on the results of the pretest that has been carried out obtaining a "quite good" category with an average score of 78.1 which has increased through the results of the posttest that has been carried out which obtained "good" results with an average score of 81.5 out of a maximum score of 100 with a KKM of 75. This shows that HOTS-based science learning using digital media with the material "Hearing Because of Sound" can be applied because it has a positive influence on students' understanding and learning outcomes.

Keywords: *Science Learning, Hearing Because of Sound, HOTS.*

Introduction

According to Piaget, elementary school children have characteristics that can think logically, objectify, investigate, try, and experiment. Therefore, to grow HOTS skills can be started in grade IV of elementary school. Where with these characteristics, it will have a significant long-term impact on student development. High-level thinking skills honed from an early age will equip them with strong provisions to face academic and life challenges in the future.

Education is the process of changing attitudes in humans through process and teaching. According to Honre, education is a conscious and planned effort that is carried out continuously to create students who can develop their potential in the spiritual, personality, cognitive and skills needed through learning activities. The Indonesian government has made systematic changes with the aim of creating a golden generation with a global mindset. So that it can compete with other countries. Efforts to change systematics in education have not been able to maximize and are unable to develop students' HOTS thinking skills. The industrial revolution 4.0 government is required to prepare students who are capable of skills to analyze, evaluate and create in the face of various problems. Students are directed to have HOTS (Higher Order Thinking Skills) skills (Tasrif 2022).

HOTS is a high-level thinking skill in solving problems that requires a person to be able to think critically both in analysis, evaluation and creation of information and data obtained. According to Saputra, the goal of HOTS is to improve students' thinking skills at a higher level in receiving various information, solving problems through their knowledge, and making decisions in complex conditions. This shows that HOTS skills are important to be stimulated from an early age so that children can face various complex problems with creative strategies. Learning that is varied, comprehensive and contains complete material will certainly make it easier for children in understanding the teaching material and can facilitate students in developing HOTS thinking skills. However, in reality, in the learning process, there are still many limitations in the use of HOTS-based teaching materials. Learning activities that are facilitated with comprehensive and complete teaching materials can make it easier for students to learn teaching materials. In creating this learning, of course, it must be accompanied by the quality of teaching materials that can stimulate HOTS. HOTS-based teaching materials have the potential to improve the quality of education. However, the reality is that in implementing effective learning strategies in schools, it is still limited to teaching materials (Ratu 2018).

The following are some of the results of research conducted by several researchers: The research was written by "Fadliyah, I. Ketut Widiada and Muhammad Syazali" with the title "Identification of Difficulties of Elementary School Students in Solving HOTS-Based Problems in Science Subjects". Mataram University, Indonesia has similarities with the author's research. Where in this study it is explained that at SDN 12 Ampenan School, especially in grade V. There are still difficulties in solving HOTS-based questions in the content of science in class V. Such as difficulties in understanding the command of the questions, understanding the meaning of pictures, understanding the choice of answers, knowing the meaning of words, difficulties in determining answer choices and difficulty concentrating in doing problems. This research was conducted using a qualitative descriptive approach. Data collection techniques using tests and interviews (I. K. Fadliyah 2023)The difference with the author's research is that at SDN 12 Ampenan, for data analysis techniques use a qualitative descriptive approach.

Data analysis consists of data collection, data reduction, data presentation, and conclusion drawn. This study aims to describe the difficulties of students in solving HOTS problems in the content of science class V at SDN 12 Ampenan. Meanwhile, in the research, the author uses quantitative and qualitative analysis. For the data analysis, it is the same, only

here the author does not use data reduction. This study aims to describe the difficulties of students in solving Higher Order Thinking Skills (HOTS) questions by using digital media to improve thinking skills in science subjects.

Then in the research written by Homi Apriani, Lalu Hamdian Affandi and Dyah Indraswati. With the title "Analysis of students' difficulties in solving HOTS (Higher Order Thinking Skills) questions". On the content of social studies class V at SDN 1 Gapuk" from PGSD FKIP University of Mataram. It has similarities with the author's research where in this study it is explained that in the school of SDN 1 Gapuk. Still difficulties experienced by students in solve the HOTS questions. Among them are students who have difficulty understanding problems, analyzing problems, considering and difficulty concentrating. This research was conducted using a Qualitative Descriptive approach. Data collection techniques, using documentation and interviews. To overcome these problems, students are required to study hard. In overcoming students' difficulties in concentration when working on problems by giving a break when they finish studying by working on the problem. (Homi Apriani 2024). Meanwhile, the difference with the author's research is that the data analysis used at SDN 1 Gapuk is data analysis from Miles and Huberman which consists of data collection, data reduction, data presentation and conclusion drawn. Meanwhile, in this study, the author uses quantitative and qualitative data analysis techniques. As well as data collection techniques through interviews, observations and tests.

The research was written by "Kastri Fani, Fauziana, and Rahmiaty" with the title "Analysis of students' ability to solve HOTS problems in science lessons in class V science lesson MIN 25 Aceh". IAIN Lhokseumawe University, has similarities with the author's research. Where in this study it is explained that at MIN 25 North Aceh School, especially in class V with a total of 28 students. Among them, there were 14 students with low abilities who were only able to solve HOTS problems on the C4 indicator (analyze), then as many as 8 students who were moderately capable on the C4 (analyze) and C5 (evaluating) indicators. And as many as 6 students with high abilities have been able to solve HOTS questions on indicators C4 (analyzing), C5 (evaluating) and C6 (creating). The difficulties experienced by students in solving HOTS questions are students working on the questions in a hurry, students, low levels of concentration and knowledge of students in solving HOTS questions, as well as lack of parental motivation and unsupportive economic conditions. Efforts to overcome students' difficulties are by providing remedial teaching, material repetition activities (enrichment), and motivation that can encourage students to be more active in learning, able to solve problems well, and students gain knowledge in accordance with the expected competencies and basic competencies (Kastri Fani 2021). Meanwhile, the difference with the author's research is that MIN 25 School is still limited in providing HOTS type science questions to students and is more likely to provide LOTS and MOTS type questions. Efforts are made to overcome the difficulties of these students by providing remidials, enrichment and motivation. The research method used is a descriptive qualitative method. For the research instrument, it uses observation, interview, and documentation guidelines.

The data analysis technique uses data reduction and conclusion drawn. Meanwhile, the problem that occurred in the author's research was that the teacher had given LOTS, MOTS and HOTS questions but students still had difficulty doing them. Even though they have often conducted experiments in direct science practice. But students still find it difficult to do it. So here the author uses digital media to improve the ability to think Higher Order Thinking Skills (HOTS) in the subject of Social Studies. The research method, the author uses qualitative and quantitative methods. For the research instrument, interviews, observations, and tests were used.

From the above studies, there are similarities with this study, namely both researching the implementation of HOTS-based questions in science subjects in class V SD/MI. Where there are some students in high grades who still have difficulty in solving HOTS-based questions in the content of science in class V. Such as still having difficulty in understanding the meaning of pictures, difficulty in understanding the choice of answers, difficulty in knowing the meaning of words, difficulty in determining answer choices and difficulty concentrating in doing problems. This research was conducted using a qualitative descriptive approach. The data collection technique uses tests and interviews. The test instruments given were 10 multiple-choice questions and 3 questions about the description of the content of IPAS based on LOTS, MOTS, and HOTS. The data analysis used in this study consists of data collection, data presentation, and drawing conclusions. The test instruments given were 6 questions consisting of multiple choices of IPAS load descriptions based on HOTS.

The author chose the research with the title "Implementation of Digital Media in Improving Higher Order Thinking Skills (HOTS) in Science Subjects". Because according to the researcher, many concepts in science lessons are abstract and difficult to visualize directly. Digital media allows for engaging and informative visual presentations. Such as videos, animations, simulations, educational games and graphics that can improve students' understanding of IPAS materials.

The author chose this school because it has more complete and well-documented data. Such as student data, teachers and learning outcomes. Of course, the existence of this data is very important for data analysis. And also this school is more open to collaborating with researchers. Especially if the research can provide direct benefits to the school and students.

This study aims to reveal the extent to which the use of digital media in animation-based learning can improve the ability of grade V students at SD Negeri 1 Butuh, Purworejo in analyzing data from IPAS experiments. In addition, the researcher will also identify any obstacles.

Methods

This research is a classroom action research conducted to gain an understanding related to a learning problem in the classroom by carrying out various structured actions, as well as analyzing the effects caused by the treatment carried out. Data collection was obtained through interviews with homeroom teachers and students as well as tests conducted by students. This interview was conducted to find out more about the extent of students' understanding of the material, so that researchers can use appropriate methods to improve students' understanding. This understanding is then tested using tests that are done independently by students.

This research was conducted at SDN 1 Butuh, Purworejo class V with a total of 13 students. Where in the class was given a test instrument of 6 HOTS questions on the content of IPAS. The data collection technique uses interviews and tests to measure students' ability and understanding in solving HOTS questions. In addition to using HOTS-based questions, the researcher also presented learning videos and singing songs about the parts of the ear using the tune of the song "If You Like Hati" and paired the names of the parts of the ears to the pictures that had been provided to make it easier for students to remember and test their abilities.

The data analysis techniques used in this study are quantitative and qualitative data analysis techniques. Where the quantitative analysis in this study was obtained through the analysis of students' pretest and posttest scores to see whether there was an increase in the results obtained before and after using digital media, as well as calculating the percentage of

students who were wrong on each test question to analyze the pattern of errors. Meanwhile, qualitative analysis is used to obtain more accurate data through interviews with students to find out the reasons for their difficulties in doing test questions.

Result

This research activity was carried out on September 20, 2024 at SD Negeri 1 Need, precisely in grade V. Through interviews with homeroom teachers, information was obtained that some grade V students had difficulty in understanding hearing material because of sound, especially in mentioning parts, functions, and also disorders in the ears. This is in accordance with the results of the pretest that students take independently through questions. Based on the data on pretest scores, it is known that there are 7 students who meet the KKM and 6 students who do not meet the KKM with the lowest score of 68 and the highest score of 92 with the KKM of 75. The average is 78.1. The results of the student test are presented in table 1.

No	Name	Number Question													Value
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	A	1	1	1	1	1	1	1	1	1	0	5	4	5	92
2	B	1	1	1	1	1	0	1	1	1	1	4	4	3	87
3	C	1	1	1	1	0	1	1	1	1	0	4	3	3	72
4	D	1	1	1	1	1	1	1	1	1	0	4	4	4	84
5	E	1	1	1	1	0	0	1	1	1	1	3	3	3	68
6	F	1	1	1	1	0	1	1	1	1	0	4	3	3	72
7	G	1	1	1	1	1	1	1	1	1	0	4	4	4	84
8	H	1	1	1	1	0	0	1	1	1	1	3	3	3	68
9	I	1	1	1	1	1	1	0	1	1	1	4	4	3	80
10	J	1	1	1	1	0	0	1	1	1	1	3	3	3	68
11	K	1	1	1	1	1	1	0	1	1	0	4	3	3	72
12	L	1	1	1	1	1	0	1	1	1	1	5	4	3	84
13	M	1	1	1	1	1	1	1	1	1	0	5	4	3	84
Evarage															**78,1**

Description: (1) Correct Answer, (0) Wrong Answer, no.11, 12, and 13 maximum score 5. So that the determination of the value is obtained from the formula:

$$\frac{Jumlah\ perolehan\ SKOR}{Jumlah\ Skor\ Maksimal\ (25)} \text{ x } 100.$$

Based on the table, there are 7 students who meet the KKM and 6 students who do not meet the KKM with the lowest score of 68 and the highest score of 92. A total of 5 students answered wrong on number 5, 5 students answered wrong on number 6, 2 students answered wrong on number 7, and 7 students answered wrong on number 10. In numbers 11, 12, and 13, the maximum score is 5 if the student's answer is correct and correct, and will be reduced if the answer is not correct. The results in the table show that some students have difficulty distinguishing the names and functions of the ears as well as ear disorders.

In number 5, students had difficulty in understanding the picture, they felt confused about the function of the ear part indicated by the arrow in the picture. In number 6, students find it difficult to determine the process of hearing sounds in the eardrum. In number 7,

students felt confused in choosing diseases in the ear until they finally answered the wrong answer. Then in number 10 where 7 students answered wrong, a picture of the ear was presented starting from the outer ear, middle to the inner. And asked about the function of one of these parts. Students feel confused about their function, so they answer it originally. The question asks about the function of the cochlea, which is to receive and transmit sound to the auditory nerve. However, some students answered the body balance regulator.

In essay questions number 11, 12, and 13, students were asked to explain things related to ear material, ranging from how to maintain ear health, explaining the function of the ear, to analyzing ways that can be used to prevent ear disorders. On average, students answered inappropriately so that the results obtained were not optimal. There are some students who answer questions originally because they are afraid that their friends have collected the results of their work.

Students revealed that they had difficulty in choosing the right answer, because they thought that the answer was correct. This is also supported by the opinion of the homeroom teacher of SD Negeri 1 Butuh, that most students sometimes have difficulty in determining parts and functions as well as disturbances in the ears, so it requires repetition every day. In addition, the student's low memory also affects him when answering questions.

In addition to confusion in choosing the right answer, students also have difficulty in concentration, because they see that many of their friends have collected their work, so they do not focus while working on the questions. Another obstacle is the pictures on the worksheet and the pictures on the learning media that are slightly different. Although it looks trivial, this has a great effect on students' understanding. Such as affecting students' memory in remembering the details of the ear structure from the outside to the inside. Pictures function as visual aids that help students in understanding a concept of knowledge. When there is a difference between the worksheet and the learning media, this can cause confusion for students about the part that is intended. In addition, when the image is inconsistent, it can cause students to misinterpret information, which can later lead to a wrong understanding of the function and part of the ear.

Discussion

Based on the results of the pretest, students had difficulty in determining the correct answer because they were deceived by other options and thought it was correct. One of the factors that affect students' learning difficulties is the intellectual/intelligence factor. Students' ability to determine the correct answer requires a deep thinking process that is closely related to their intellectual abilities. This is one aspect of high-level thinking skills as *a transfer of knowledge* related to students' cognitive (Fadliyah 2023). This process is related to the ability to think, understand, determine and reason.

After learning using digital media, in the form of learning videos broadcast through LCD projectors, it can be seen that grade V students of SD Negeri 1 Butuh have experienced an improvement in their learning outcomes. This can be seen based on the data of postes scores that have been carried out by students. Based on the postage score data, it is known that there are 11 students who meet the KKM and 2 students who do not meet the KKM with the lowest score of 72 and the highest score of 96 with the KKM of 75. The average is 81.5. The results of the student test are presented in table 2.

No	Nama	Nomor soal													Nilai
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	A	1	1	1	1	1	1	1	1	1	1	5	4	5	96
2	B	1	1	1	1	1	1	1	1	1	1	5	4	4	92
3	C	1	1	1	1	1	1	1	1	1	0	4	3	3	76
4	D	1	1	1	1	1	1	1	1	1	1	4	4	4	88
5	E	1	1	1	1	1	0	1	1	1	1	4	3	3	76
6	F	1	1	1	1	0	1	1	1	1	1	4	3	3	76
7	G	1	1	1	1	1	1	1	1	1	0	4	4	4	84
8	H	1	1	1	1	1	0	1	1	1	1	3	3	3	72
9	I	1	1	1	1	1	1	0	1	1	1	4	4	3	80
10	J	1	1	1	1	0	1	1	1	1	0	4	3	3	72
11	K	1	1	1	1	1	1	1	1	1	1	4	3	3	80
12	L	1	1	1	1	1	0	1	1	1	1	5	4	3	84
13	M	1	1	1	1	1	1	1	1	1	0	5	4	3	84
Rata-rata															**81,5**

Description: (1) Correct Answer, (0) Wrong Answer, no.11, 12, and 13 maximum score 5. So that the determination of the value is obtained from the formula:

$$\frac{Jumlah\ perolehan\ SKOR}{Jumlah\ Skor\ Maksimal\ (25)} \text{ x } 100.$$

Based on the table, there are 11 students who meet the KKM and 2 students who do not meet the KKM with the lowest score of 72 and the highest score of 96. A total of 4 students had posted results that did not change from the results of the pretest. Meanwhile, 9 other students experienced an increase in the results of their achievements. And there are 2 students who have increased their grades but are still below the KKM.

Based on tables 1 and 2, it can be seen that there is a decrease in the rate of student errors in answering. In number 5 the pretest results show 5 students answered wrong and in the post results show 2 students answered wrong. At number 6 the pretest results showed 5 students answered wrong and the postes results showed 3 students answered wrong. At number 7 the pretest results show 2 students answered wrong and the postes results show 1 student answered wrong. At number 10 the pretest results showed 7 students answered wrong and the postes results showed 4 students answered wrong.

This shows that students are easier to remember and understand listening material because of the sound through digital media that has been done. Through the learning videos that have been aired, one of which is in the form of singing parts of the ear and its functions, students are easier to memorize so that they sharpen their memory more.

Conclusion

This research was conducted at SD Negeri 1 Butuh to help grade V students understand hearing material due to sound, especially related to parts, functions, and disorders in the ear. The results of the pretest showed that only 7 out of 13 students achieved the Minimum Completeness Criteria (KKM) with an average score of 78.1. Many students have difficulty answering questions, especially those related to images and the function of the ears, which makes them confused. To overcome this problem, researchers applied digital learning media in the form of interesting videos. After the use of video, the results of the posters showed a significant increase, where 11 out of 13 students now met the KKM with an average score increasing to 81.5. The decrease in the error rate in answering questions is also evident, which shows that students understand and remember the material more easily after watching the learning video. This emphasizes the importance of using interactive and engaging learning media to improve students' understanding, as well as reduce the confusion they faced before. Thus, this study shows that innovations in digital-based learning media can have a positive impact on student learning outcomes, especially in improving higher order thinking skills (hots) in science subjects.

References

Fadliyah, I. Ketut Widiada, Muhammad Syazali. "Identifikasi Kesulitan Siswa Sekolah Dasar Dalam MenyelesaikanSoal Berbasis HOTS Pada Mata Pelajaran IPA." *Jurnal Educatio*, 2023: 1937.

Fadliyah, I. Ketut Widiada, Muhammad Syazali. "Identifikasi Kesulitan Siswa Sekolah Dasar Dalam MenyelesaikanSoal Berbasis HOTS Pada Mata Pelajaran IPA." *Jurnal Educatio*, 2023: 1931-1938.

Homi Apriani, Lalu Hamdin Afandi, Dyah Indraswati. "Analisis Kesulitan Siswa Dalam Menyelesaikan Soal Hots (Higher Order Thinking Skills) Pada Muatan Ips Kelas V Di Sdn 1 Gapuk." *Jurnal Ilmiah Pendidikan Dasar*, 2024: 7294-7301.

Kastri Fani, Fauziana, Rahmiaty. "Analisis Kemampuan Siswa Dalam Menyelesaikan Soal HOTS Pada Pelajaran IPA Kelas V MIN 25 Aceh." *Jurnal Genderang Asa*, 2021: 66-74.

Ratu, Ilma, Indra, Putri, Zulkardi. "Higher-Order Thinking Skill Problem On Data Reprentation In Primary School : A Case Study." *IOP PUBLISHING LTD*, 2018: 135-138.

Tasrif. "Higher Order Thinking Skills (HOTS) dalam Pembelajaran Social Studies di Sekolah Menegah Atas." *Jurnal Pembangunan Pendidikan, Vol. 10, No. 1* , 2022: 50-61.

Widiastuti, N. L. "Karakteristik dan Model layanan Pendidikan Bagi Anak Berkesulitan Belajar." *Jurnal Kajian Pendidikan Widya Accarya FKIP Universitas Dwijendra*, 2019: 168.