

The effect of the questions students have learning model assisted by interactive poster media on learning outcomes in the cognitive domain of science

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Received: 17 February 2024 | Revised: 07 May 2024 | Accepted: 09 May 2024 | Published Online: 10 May 2024

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Abstract

This research aims to describe the influence of the Questions Student Have learning model assisted by interactive poster media on learning outcomes in the cognitive science domain of fifth grade elementary school students. The type of research used is quantitative research with a quasi-experimental design, and a post-test only control group design. The population of this research was class V students at SDN 84 Singkawang, totaling 43 students using a saturated sampling technique so that the sample used was 43 students consisting of VA as the control class and VB as the experimental class. The data collection technique used in this research is a test technique in the form of a cognitive domain learning outcomes test and a non-test in the form of a student response questionnaire. The data analysis technique used is quantitative analysis in the form of independent sample t-test, effect size and descriptive percentage. The results of the research show that: (1) There are differences in students' cognitive learning outcomes in science learning in class V elementary school between classes that use the Questions Student Have learning model assisted by interactive poster media and classes that use direct learning. This is shown by the significance level between the experimental classes of $0.002 > 0.05$. (2) The Questions Student Have learning model assisted by interactive poster media has a high influence on students' cognitive learning outcomes in science learning in class V elementary school. This is shown by the Effect Size results of 0.993. (3) Positive student responses to the Questions Students Have learning model in science learning in fifth grade elementary school. This is shown from the calculations that the percentage of student responses of 80.5% is included in the very good category. So the conclusion of this research shows that there is an influence of the Questions Student Have learning model assisted by interactive poster media on learning outcomes in the cognitive science domain of fifth grade elementary school students.

Keywords: questions students have learning model; interactive poster media; cognitive domain learning outcomes of natural sciences

How to Cite: Oktorin, Y., Sumarli, & Mulyani, S. (2024). The effect of the questions students have learning model assisted by interactive poster media on learning outcomes in the cognitive domain of science. *ORBITA: Jurnal Pendidikan dan Ilmu Fisika*, 10(1), 62-70. <https://doi.org/10.31764/orbita.v10i1.22123>

INTRODUCTION

Natural science is one of the subjects in elementary school. Science is a natural subject and has a very broad relationship with human life. Science learning plays a very important role in the educational

process and technological development which is expected to be a vehicle for students to learn about themselves and the natural surroundings, as well as development and application in everyday life. According to Cahyo (2013) in principle science learning is not only the delivery of a collection of knowledge in the form of facts, concepts, principles or the delivery of abstract material, but science learning is a process of discovering knowledge, forming scientific attitudes, as well as abilities. to apply the principles of science itself in everyday life. Science learning is expected to be a vehicle for students to learn about themselves and the natural world around them, as well as prospects for further development in applying it in everyday life (Susiani, Dantes, & Tika, 2013). Science learning is said to be successful if all predetermined learning objectives can be achieved which are revealed in the science learning outcomes. Murdani and Sumarli (2019) explain that science is related to how to know nature systematically, so that science is not only mastery of a collection of knowledge in the form of facts, concepts or principles, but also a process of discovery.

The learning outcomes obtained by students cover the cognitive, affective and psychomotor domains (Rusman, 2017). Learning outcomes are a measure of the success of a learning process, because with learning outcomes, teachers can find out whether students have achieved the specified competencies (Setyowati, Sumarli, & Nurdiah, 2021) This research focuses on students' science learning outcomes in the cognitive domain. According to Anderson (Siregar, 2020), students who achieve cognitive abilities at the knowledge level are demonstrated by their ability to recall or repeat the knowledge they have received in the learning process. The importance of the cognitive domain for students in science learning is that it becomes a forum for students to study themselves and the natural surroundings, so that it can be useful in students' social life (Wulandari, Timara, Sulistri, & Sumarli, 2021)

Based on the results of pre-research conducted on April 18 2022 at SDN 84 Singkawang, it can be seen from the mid-semester assessment, especially in science subjects, that there are still many who do not reach the Minimum Completeness Criteria of 65. Of the 34 students, only 8 students who reach the Minimum Completeness Criteria. This is caused by the learning process still using conventional methods, so that students become bored in the learning process so that the teacher's explanations are poorly understood, this has an impact on students' cognitive learning outcomes. Apart from that, teachers are still unable to use learning media during the teaching and learning process in class, which causes learning to be monotonous, the class situation is passive and verbal, that is, students are only given the way and accept, and the teacher carries out teaching using verbal (verbal) alone. It is rare to find further learning activities such as discussions or making discoveries. So that less active use of learning media will have a negative impact on students and teachers, because the material provided is not understood by students. In the context of the problems that arise above, a fun learning model is needed, so that the material presented can be understood because students feel more interested in paying attention to the teacher's explanations in science learning. Conditions like this can be overcome by implementing appropriate learning models for learning, especially in science subjects, one of which is the Questions Student Have learning model.

Questions Students Have according to Silberman (2020) is an easy way to learn about students' desires and expectations. This method uses a technique to gain participation through writing rather than conversation. According to (Suprijono, 2019), the Questions Students Have learning model is an active learning model developed to train students to have the ability and skills to ask questions. With this, students submit questions by writing on blank index cards which can be done with variations of group work. In practice, the Questions Students Have learning model can be applied with oral and written activities. Student learning activities can provide additional assessments in order to foster the

development of understanding and critical thinking, as well as having a positive impact on student learning outcomes. When students write and create questions on paper and then exchange them with their friends, there are verbal and visual activities.

The advantage of the Questions Student Have learning model is that it can attract and focus students' attention, so that students can concentrate more on learning. Apart from that, it can stimulate students to train to develop their thinking and memory in learning and develop courage and express opinions. This can encourage students to think in solving a problem, investigate and assess students' mastery of learning material, arouse students' interest so that it will create a desire to learn it and also attract students' attention in learning (Wahyuningsih et al., 2013).

Improvements in the learning process to improve science learning outcomes make students interested in paying attention to the teacher's explanations and make it easy for students to understand the learning material presented. The use of varied media is an alternative for improving learning (Rahmaniati, 2015). The use of media is a part that must receive attention in every learning activity. However, in reality, this part is still often overlooked for various reasons. Reasons that often arise include: limited time to make teaching preparations, difficulty finding the right media, unavailability of funds (Falahudin, 2014). In fact, there are many types of media that can be selected, developed and utilized according to conditions, time, costs and desired learning objectives. One of the many media that is applied is interactive poster media.

The role of interactive poster media in the learning process is very large for teachers in delivering learning, with the poster media used by teachers when delivering learning, it will make it easier for teachers to explain learning material, so that students will more easily understand the material presented by the teacher, so that the goal learning can be achieved (Rahmaniati, 2015). This is supported by the opinion of Sukiman (2012) who states that posters have advantages, including being able to assist teachers in conveying learning and helping students learn, attracting attention, encouraging students to study more actively, can be installed or pasted everywhere, thus giving students the opportunity to learn. and remembering what has been learned can suggest changes in the behavior of students who see it. In this way, students will more easily understand the material presented by the teacher, so that learning objectives can be achieved.

Similar research was conducted by (Nurdiansyah, 2019) who stated that the Questions Students Have learning model was effective in improving student learning outcomes in mathematics subjects for fifth grade students at AL-Hijrah Elementary School, Makasar City. The results of research by (Tageh & Budiartini, 2017) show that the Questions Students Have (QSH) learning model assisted by snakes and ladders has a significant effect on the science learning outcomes of class IV students in Cluster II Banjar District for the 2016/2017 academic year. Based on this description, the author is interested in conducting research which aims to describe the influence of the Questions Student Have learning model assisted by interactive poster media on learning outcomes in the cognitive science domain of fifth grade elementary school students.

METHODS

This research uses a quantitative type of research with a quasi experiment. According to Sugiyono (2020), quasi experimental has a control group, but it cannot function fully to control external variables that influence the implementation of the experiment. This research was carried out at SD Negeri 84 Singkawang in the even semester of the 2022/2023 academic year. The population in this study were

43 students in classes VA and VB. The sample in this study was taken using a saturated sampling technique, namely VA, totaling 22 students, as the control class and VB class, totaling 21 students, as the experimental class. The data collection techniques used in this research are test and non-test techniques. The test used is a cognitive domain learning outcomes test in the form of an essay. This test was given to two sample classes, namely the experimental class and the control class. Tests in the experimental and control classes were carried out after the learning was carried out. The non-test technique is in the form of a student response questionnaire given to the experimental class after implementing the Questions Student Have learning model assisted by interactive poster media. The test given is in the form of questions on material changes in the form of objects representing indicators C1 to C5. The student response questionnaire used in this research was adapted from (Novanto, Anitra, & Wulandari, 2021) which has been validated with a score of 84% of very good criteria. The data analysis techniques used are mann-whitney, effect size, and descriptive percentage. This mann-whitney was used to describe differences in science learning outcomes in the cognitive domain of students who used the Questions Student Have learning model assisted by interactive poster media using direct learning. Effect Size is used to describe how much influence the Questions Students Have learning model assisted by interactive poster media has on learning outcomes in the cognitive science domain of fifth grade elementary school students. Descriptive percentages are used to describe the responses of class V students to the Questions Students Have learning model assisted by interactive poster media.

RESULTS AND DISCUSSION

Result

Differences in students' cognitive learning outcomes in science learning in fifth grade elementary school between classes that use the Questions Student Have learning model assisted by interactive poster media and classes that use direct learning

Normality test

The results of the data normality test using the Kolmogorov Smirnov test in the experimental group showed that the average value was 7.76, the standard deviation value was 1.35, the absolute value (D) was 0.183 and the probability value (α) was 0.06. Based on the hypothesis test which states that if $\alpha > 0.05$ then H_a is accepted. Because the value of $\alpha = 0.06$, H_a is accepted, meaning the data is normally distributed ($p > 0.05$). The results of the normality test calculations can be seen in Table 1.

Table 1. Experimental Group Normality Test

Mean	7.76
Standard Deviation (SD)	1.35
D	0.183
P	0.06

The results of the data normality test using the Kolmogorov Smirnov test in the control group showed that the average value was 5.87, the standard deviation value was 2.30, the absolute value (D) was 0.017 and the probability value (α) was 0.72. Based on the hypothesis test which states that if $\alpha > 0.05$ then H_a is accepted. Because the value of $\alpha = 0.06$, H_a is accepted, meaning the data is normally distributed ($p > 0.05$). The results of the normality test calculation in Table 2 are as follows:

Table 2. Control Group Normality Test

Mean	5.87
Standard Deviation (SD)	2.30
<i>D</i>	0.107
<i>P</i>	0.72

Based on the results of the normality test using the Kolmogorov Smirnov test in the experimental class and control class. The calculation results obtained in Table 1 and Table 2 show that in the experimental class the significance level is $0.06 > 0.05$, while the significance level in the control class is $0.72 > 0.05$ so it can be concluded that the two data tested are normally distributed.

Homogeneity Test

The results of the data homogeneity test analysis using the Levenes's test in the experimental and control groups showed that the homogeneity test calculation results showed that the *F* value was 5.782 and the probability value (α) was 0.021. Based on the hypothesis test which states that if $\alpha > 0.05$ then H_a is accepted. Because the value of $\alpha = 0.021$, H_a is rejected, meaning the data is not homogeneous ($p < 0.05$). The results of the homogeneity test calculation can be seen in Table 3.

Table 3. Homogeneity Test

<i>F</i>	5.782
<i>P</i>	0.021

Hypothesis test

The results of data analysis using the Mann-Whitney test for the experimental and control groups showed that the mean rank for the experimental group was 27.38 and the mean rank for the control group was 16.38. Then the *U* value is 118.000 and the *Z* value is -2.767 with a significance level of 0.006 ($p < 0.05$). The calculation results of the Mann-Whitney test and hypothesis testing using SPSS version 26 can be seen in Table 4.

Table 4. Mann-Whitney Test

Variable	Group	Mean Rank	<i>U</i>	<i>Z</i>	<i>P</i>
Learning outcomes in the cognitive domain	Experiment	27.38	118.000	-2.767	0.006
	Control	16.38			

Based on the calculation results of the hypothesis test, it shows that the significance level is $0.006 < 0.05$, so H_a is accepted. It can be concluded that there are differences in students' cognitive learning outcomes in science learning in class V elementary school between classes that use the Questions Student Have learning model assisted by interactive poster media and classes that use direct learning.

The magnitude of the influence of the Questions Students Have learning model assisted by interactive poster media on students' cognitive learning outcomes in science learning in class V elementary school.

The results of data analysis using Cohen test show that the Effect Size value obtained is 0.18. The test calculation results can be seen Mann-Whitney Effect Size Test. These results are presented in Table 5.

Tabel 5. Mann-Whitney Effect Size Test

Z	-2.767
Z ²	7.66
n	43
Effect Size	0.18

Based on the results of Cohen test calculations, it shows that the Effect Size value is 0.18. It can be concluded that the Questions Student Have learning model assisted by interactive poster media on students' cognitive domain learning outcomes in science learning in class V elementary school has a very high influence on students' cognitive domain learning outcomes.

Student responses to the Questions Students Have learning model assisted by interactive poster media in science learning in fifth grade elementary school

The results of data analysis using a descriptive percentage test show that the percentage value obtained is 80.5% in the very good category. These results are presented in Table 6 below:

Table 6. Percentage Descriptive Test

Variable	Mean	Percentage	Category
Questions students have learning model	8.05	80.5	Very good

The student response questionnaire used in this research was to determine student responses to the Questions Students Have learning model in science learning in fifth grade elementary school. The student response questionnaire consists of 4 indicators, namely relevance, attention, satisfaction and self-confidence. The scale used is in the form of positive and negative statements totaling 16 statements. The calculation results in Table 6 show that the average student response obtained was 8.05 and the percentage of student responses was 80.5%, which was included in the very good category. Positive student responses to the Questions Students Have learning model in science learning in fifth grade elementary school.

Discussion

The first aim of this research is to describe the differences in students' cognitive learning outcomes in science learning in fifth grade elementary school using the Questions Student Have learning model assisted by interactive poster media and classes that use direct learning. The results of the research show that there is a significant difference between students' cognitive learning outcomes in science learning in class V elementary school using the Questions Student Have learning model assisted by interactive poster media and classes that use direct learning. These results indicate that the Questions

Students Have learning model assisted by interactive poster media has a significant effect on improving student learning outcomes. These results indicate that the Questions Students Have learning model assisted by interactive poster media has a significant effect on improving student learning outcomes. These results were obtained because the Questions Students Have learning model with the help of interactive poster media could be used effectively by researchers. Students are given the opportunity to ask questions about material they do not understand and then answer them together by the students. This certainly provides students with an impressive learning experience so they can understand the lesson well.

These results are in line with the results of research conducted by Oktaviana et al (2022). It can be concluded that there is an influence of the Question Student Have learning strategy with the wheel of fortune technique on students' cognitive learning outcomes. The results of Elvina's (2020) research show that the application of the Student Have Question Type Active Learning strategy can improve students' ability to ask questions in science subjects on animal life cycles at SD IT Miftahul Jannah Medan. The research results of (Tageh & Budiartini (2017) show that the Questions Students Have (QSH) learning model assisted by snakes and ladders has a significant effect on the science learning outcomes of class IV students in Cluster II Banjar District for the 2016/2017 academic year. The research results of Harahap & Nugraheni (2021) show that the development of the Questions Student Have learning model can encourage students to maximize their potential and be actively involved in the learning process and the subject matter is easy to understand.

The second aim of this research is to describe how much influence the Questions Students Have learning model assisted by interactive poster media has on students' cognitive learning outcomes in science learning in class V elementary school. The research results show that the magnitude of the influence of the model is 0.18 and is in the very high category. The high influence provided by the Questions Student Have learning model as a unified poster media is due to the process carried out in accordance with the stages in the model, thus making learning interesting and easy for students to understand.

Several previous studies regarding the magnitude of the influence of the Questions Student Have learning model on learning outcomes varied greatly, such as research conducted by Salami et al (2016) which found that the resulting effect size was 0.44 in the medium category. Apart from that, the research results of Putri & Harun (2015) found that the effect size obtained was 0.74 in the medium category.

The third objective of this research is to describe students' responses to the Questions Students Have learning model in science learning in fifth grade elementary school. The research results showed that the student response to this model was 80.5% in the very good category. Then the overall level of student response is in the high category, this shows that students have a positive response to the Questions Student Have learning model in science learning in class V elementary school. The positive response given by students to the Questions Student Have learning model assisted by poster media was due to the delivery carried out by the researcher in an interesting way so that students felt comfortable during the learning process.

In line with research conducted by Mazidah (2016), it shows that there is a student response when implementing the Learning Cycle 5E learning model with the Question Student Have strategy on temperature material and the changes have very good criteria with a percentage of 90%. The results of research conducted by Putra et al., (2017) showed that the results of the Question Student Have learning method questionnaire analysis showed that 54% of the responses were very positive, 28% of the responses were positive and no students had quite positive responses. Research conducted by Sulisty

(2015) showed that students' responses to learning as a whole were positive and included in the good response criteria with an average percentage of student responses of 81.40% in the very good category.

CONCLUSIONS

Based on the results of the research and discussion, it can be concluded that: (1) There are differences in students' cognitive learning outcomes in science learning in class V elementary school between classes that use the Questions Student Have learning model assisted by interactive poster media and classes that use direct learning. This is shown by the results of the significance level, namely $0.002 < 0.05$; (2) The Questions Student Have learning model assisted by interactive poster media has a high influence on students' cognitive learning outcomes in science learning in class V elementary school. This is shown by the results of Effect Size = 0.993; (3) Positive student responses to the Questions Students Have learning model in science learning in fifth grade elementary school. This is shown from the calculations that the percentage of student responses of 80.5% is included in the very good category. Thus, the Questions Student Have learning model assisted by interactive poster media has an influence on learning outcomes in the cognitive science domain of fifth grade elementary school students.

The application of the Questions Student Have learning model assisted by interactive poster media can be used as an alternative that can be applied in the science learning process. So it can improve students' cognitive learning outcomes. It is hoped that the results of this research will be able to provide useful contributions to readers.

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