Improving Students' Critical Thinking Skills with The Discovery Learning Model Assisted by Realia Learning Media

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A B S T R A K

Pembelajaran IPA menekankan pada pemberian pemahaman, pengalaman dan praktik secara langsung untuk mengembangkan potensi peserta didik. Tetapi fakta di lapangan menunjukkan bahwa kondisi pembelajaran di sekolah belum berjalan dengan baik. Penelitian ini bertujuan untuk mengetahui pengaruh model Discovery Learning berbantuan media realia terhadap kemampuan berpikir kritis muatan IPA pada siswa kelas V SD. Penelitian ini desain eksperimen semu dengan rancangan desain penelitian Nonequivalent Control Group Design. Populasi dalam penelitian ini sebanyak 190 orang siswa dengan dua kelompok sampel yaitu kelompok eksperimen yang berjumlah 38 orang siswa dan kelompok kontrol yang berjumlah 37 orang siswa. Metode pengumpulan data menggunakan tes bentuk uraian. Data hasil penelitian dianalisis dengan teknik analisis statistik deskriptif dan teknik analisis statistik inferensial menggunakan uji-t. Hasil analisis hipotesis diperoleh bahwa thitung sebesar 3,407 dan ttabel sebesar 1,993 dengan taraf signifikan 5% dan dk = 73. Karena thitung 3,407 lebih besar dari ttabel 1,993, sehingga Ha diterima. Hal ini berarti terdapat perbedaan kemampuan berpikir kritis muatan IPA siswa yang dibelajarkan dengan model Discovery Learning berbantuan media realia dan kelompok siswa yang tidak dibelajarkan dengan model Discovery Learning berbantuan media realia siswa kelas V SD.

A B S T R A C T

Science learning emphasizes the provision of understanding, experience and direct practice to develop students' potential. But the facts on the ground show that the learning conditions in schools have not gone well. This study aims to determine the effect of the Discovery Learning model assisted by realia media on the critical thinking skills of science content in fifth grade elementary school students. This study was a quasi-experimental design using the Nonequivalent Control Group Design. The population in this study were 190 students with two sample groups, namely the experimental group which consisted of 38 students and the control group which consisted of 37 students. Methods of data collection using a test form of description. The research data were analyzed using descriptive statistical analysis techniques and inferential statistical analysis techniques using the t-test. The results of the analysis of the hypothesis showed that tcount was 3.407 and ttable was 1.993 with a significant level of 5% and dk = 73. Because tcount 3.407 was greater than ttable 1.993, Ha was accepted that there are differences in students' critical thinking skills in science content who are taught with the Discovery Learning model assisted by realia media and the group of students who are not taught with the Discovery Learning model assisted by realia media in fifth grade elementary school students.

1. INTRODUCTION

Science learning involves almost all existing aspects, namely: emotional, intellectual and psychomotor so that students can achieve abilities which include: cognitive, affective, and psychomotor (Novitasari & Harjono, 2019; Parmiti et al., 2021). Effective learning can be seen from the interaction between students and teachers and students with other students. Educators are a supporting factor that underlies student success because educators play a role in underlying and building student motivation to participate actively in learning (Pujawan et al., 2022; Sudirtha et al., 2022). A teacher must be able to motivate students either through methods, models, approaches or with certain strategies. A teacher also

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has a role in creating an active and fun classroom atmosphere for students so students don't feel bored in learning, because students are not only objects but also subjects in learning and not only receive knowledge in finished form but students participate. finding, thinking, and experiencing the acquisition of knowledge due to the efforts made by students, it can be concluded that the quality of learning is a teaching and learning process that occurs effectively so that it can produce the success of the goals achieved (Fajri, 2019; Prasetyo & Kristin, 2020).

Based on the results of observations of fifth grade students at SD Gugus III Sukawati, that the learning conditions observed at school had not been going well. The problems found were related to the learning process in class, based on observations, interviews with the homeroom teacher and several teachers at the school and directly observing the learning that took place in class V. After paying deeper attention it was found that in the implementation of learning in class the teacher tended to deliver learning that was still centered to the teacher while students are only listeners, so learning tends to look very boring. It was also found that students tended to be passive during the discussion, most students could not re-explain the concepts they had learned, this was due to the lack of knowledge of students in finding the main idea of the problem given then the most common thing that happened when the teacher explained the learning material in class students even enjoy playing and joking with friends around them so they don't focus on participating in learning and also the material conveyed cannot be well received by students because the delivery of material tends to be monotonous. This proves that there are several problems that occur where the main problems encountered are low critical thinking ability, low student understanding of the material that has been presented, learning is boring because it uses models that tend to be monotonous and students who are very less active in the learning process.

Efforts are needed to overcome the problems that occur, therefore it is necessary to improve students' critical thinking skills so that they can increase their understanding of critical thinking skills in science content to the fullest and an action that creates students carrying out active and fun learning activities (Abualrob, 2019; Hasyim et al., 2020). The lack of students' ability to play an active role in learning is very influential on students' curiosity and the material obtained tends to be quickly forgotten. It is realized that science learning also develops some very important things such as skills, attitudes and scientific processes in learning. So the importance of critical thinking skills in its implementation.

Based on the problems found, efforts that can be made to create optimal and active learning conditions are by applying the Discovery Learning model. The use of the Discovery Learning model is considered very suitable in learning science. The Discovery Learning Model is a learning model that requires students to find out information and also their own knowledge by conducting experiments or discovering the concepts they are studying (Hartati et al., 2020). The Discovery Learning Model is a learning model that requires students to play a leading role by developing students' critical thinking to be more active in investigating and discovering learning concepts, as a result students will more easily understand and remember the material obtained more (Marisya & Sukma, 2020). In addition, the Discovery Learning model is a student-centered learning strategy where students are asked to investigate, find their own problems that are joined in small groups that emphasize the importance of understanding ideas and structures in learning activities, with the application of this model students are required to think more critical (Setyawan & Kristanti, 2021; Yusuf, 2018).

In addition, the use of the Discovery Learning model is considered very appropriate when combined with a media to support the success of the expected achievement. The media that is considered suitable when collaborated with the Discovery Learning model is Realia media as the learning medium. Science learning basically provides direct learning experiences, namely by using and developing scientific process skills. Science in elementary schools is expected to use real media assistance that is around it so that the resulting learning will be much more meaningful and always attached to students so that it is easy for students to understand the learning so as to train students' critical thinking skills with scientific processes that utilize real media that are around. Media realia is all media that exist in the classroom and school environment that can be used directly by students as a medium for observing the environment (Novitasari & Harjono, 2019). Media realia are real media that can be used by teachers and students in the learning process in class which are used as teaching materials (Algiranto, 2022). So, from some of the experts' explanations, it can be explained that realia media are all used a real objects in the surrounding environment that can be seen and touched, realia media can be in the form of plants, animals, humans, money, rocks, water, soil. and many more.

The combination of the Discovery learning learning model with realia media has a very positive impact on the learning process, both teachers and students get a positive effect. This collaboration can clearly describe the real situation regarding the problem so that students can easily analyze it, so that it is hoped that it can improve and increase students' critical thinking skills in science content. Based on this

description, this study aims to determine the effectiveness of using the Discovery learning model assisted by realia media on critical thinking skills in science content in class V in Gugus III Sukawati.

2. METHOD

This research was conducted on fifth grade students at SD Gugus III Sukawati for the 2022/2023 academic year, which consisted of 8 elementary schools. This research is a quantitative study using a quasi-experimental design. Quasi-experimental design is a type of research design that has an experimental group as well as a control group. So the use of a quasi-experimental design is very suitable in this study because this study also has two groups, namely the experimental group and also the control group. In quasi-experimental design, there are two forms, namely time series design and nonequivalent control group design. In this study using the nonequivalent control group design which has two groups, namely the control group and also the experimental group (Sugiyono, 2012). This study was started by giving a pre-test to the two groups, there are experimental group and the control group. Giving a pre-test before giving treatment is used as the basis for determining a change. Then the experimental group was given treatment by applying the discovery learning model assisted by realia media and for the control group using conventional learning. Then a Post-test is given at the end of the activity to show how far there is due to treatment (X).

Population is a group that has certain characteristics and qualities determined by researchers then studied and conclusions drawn. The population in this study were 190 students with a sampling technique using the Cluster Random Sampling technique. Random sampling technique is a technique that can be used in taking samples from the population, where this random sampling technique provides an opportunity for all members of the population involved to be selected as samples, so that each class has the same opportunity to be selected as a sample. All students in the population are given a pre-test first, then the results of the pre-test will be subjected to a prerequisite test, namely the data normality test with the Kolmogorof-Smirnof test, and the homogeneity test with the Bartlett test. After all sample groups are declared normal and homogeneous, it can be continued with the equivalence test for all sample groups using the Anava test. Then for the sample there are two group: the experimental group which consisted of 38 students and the control group which consisted of 37 students.

In this study using the test method, the test method is a method of obtaining data formed by tasks that must be carried out by a person or group to be tested and from carrying out the test a score is obtained. The data collected from this study is data on the critical thinking skills of science content. The type of science knowledge competency test that will be used in this study is a essay question. The research method in this study is described in Table 1.

Table 1. Research Method

Variable	Method	Instrument	Data Source	Data Nature
Critical Thinking Skill of Science Content	Test	Essay Question	Student	Score

When the instrument has been collected, then the instrument will be tested and will get a result which will then be tested for content validity and item reliability. If the instrument meets the requirements then it is feasible to use because the instrument is able to measure and assess what you want to measure. Therefore, an instrument that is suitable for use needs to be tested for validity in collecting data before the instrument is tested. The validity test used in this study is the content validity test and item validity. The way to test the validity of the contents of the instrument is through expert tests (judges) or panels of experts in their fields (Koyan, 2011). While the validity of the item is a level that shows how far the item can consistently measure what should be measured. The correlation formula used to test the validity of the objective test items uses the Product Moment (Arikunto & Suharsimi, 2018). Then proceed with the reliability test carried out on only valid items using the *Alpha Cronbach* method. The test was continued with a test of the level of difficulty and the discriminating power of the items.

The data analysis methods and techniques that used in this study are descriptive statistical analysis and inferential statistical analysis. Descriptive statistics are statistics that use analytical methods to measure data. Descriptive analysis is used to determine the high and low quality of learning using the real media-assisted discovery learning model with students who are not taught using the real-media-assisted discovery learning model. Descriptive statistics are used to calculate the Mean, Median, Mode, Standard Deviation (SD), and Variance. The relationship between mean (M), median (Me), and mode (Mo) can be used to determine the slope of the frequency distribution polygon curve.

The method of inferential statistical analysis is carried out by collecting data for analysis. The analytical technique used to analyze data in research is inferential statistics. T-test to test the hypothesis.

Before conducting the t-test, there are several conditions that must be met in advance to test the hypothesis, namely the prerequisite test for data analysis in the form of normality and homogeneity. Normality test using Kolmogorov-Smirnov. To test the hypothesis in this study, researchers used t-test independent sample t-test uncorrelated formula polled variance.

3. RESULT AND DISCUSSION

Result

Based on the data analysis performed, the results of the normality test for the distribution of pre-test and post-test data on the critical thinking skill of the science content from the experimental and control groups of students can be presented in Table 2.

Table 2. Pre-Test and Post-Test Normality Test Results

Data	Sample Group	|Ft-Fs|	Table *K-S*	Conclusion
Critical Thinking Skill of Science Content	Experiment	0.142	0.218	Normally Distributed
	Control	0.129	0.221	Normally Distributed

The recapitulation of the results of the pre-test and post-test variance homogenity tests between the experimental group and the control group is presented in Table 3.

Table 3. Pre-Test and Post-Test Homogenity Test Result

Data	Sample Group	Varians	F_{count}	F_{table}	Conclusion
Critical Thinking Skill of Science Content	Eksperiment	27.39	1.34	1.73	Homogen
	Control	36.72			Homogen

H0 or known as the null hypothesis is what was tested in this study. The sound of the null hypothesis is that there is no significant difference in the ability to think critically in science content taught by the Discovery Learning learning model for fifth grade students in elementary school. The recapitulation of the t-test calculation results is presented in Table 4.

Table 4. The Result of T-test

Sampel	N	Dk	X	S^2	t_{count}	t_{table}
Experiment	38	73	86.74	27.39	3.407	1.993
Control	37		76.95	36.72		

The results of the t-test calculation, the tcount is 3.407. While the ttable value is at a significant level of 5% with dk = n1 + n2 – 2 = 73, indicating that the value of the t_{table} is 1.993. These results show that t_{count} = 3.407 is greater than t_{table} = 1.993, resulting in rejection of H0 and acceptance of Ha.

Discussion

Based on the results of the acquisition of scores in the two groups which initially had equivalent abilities, after being given treatment in the experimental class the acquisition of values for critical thinking skills experienced differences. The students' critical thinking skills in the experimental class are better and superior when compared to the students' critical thinking skills in the control class. The difference in the results of critical thinking skills in the experimental class and the control class is caused by the treatment, which is in the form of a Discovery Learning model assisted by realia media which is given only to the experimental class.

The Discovery Learning learning model is carried out by applying 6 learning stages, namely (1) stimulus (stimulation), (2) problem identification (problem statement), (3) data collection (data collecting), (4) data processing (data processing), (5) verification, (6) generalization (Andriatna et al., 2021; Dewi et al., 2017). The Discovery Learning learning model is a learning model that can develop active student learning methods by discovering for themselves, investigating by themselves, so that the results obtained by students can last a long time in memory, will not be easily forgotten by students (Aswirna & Ritonga, 2020; Hosnan, 2016). The Discovery Learning learning model is a student-centered learning strategy where students are brought to a problem or look for answers with clear procedures and structures (Hamalik, 2011). The Discovery Learning learning model is a learning model that emphasizes

the importance of understanding structures, or ideas that are important to a scientific discipline through active involvement of students in learning activities (Kadri & Rahmawati, 2015; Setiyowati & Panggayuh, 2019).

There is an average difference between the critical thinking abilities of the group of students who are taught with the Discovery Learning model assisted by realia media and the group of students who are not taught with the Discovery Learning model assisted by realia media because the Discovery Learning model invites students to associate the learning delivered with real life based on learning material which takes place with stimulation then problem identification followed by data collection, data processing, verification or also known as proof until finally drawing generalizations or drawing conclusions. then the Discovery Learning model helps students to be directly involved, understand concepts and solve problems being studied which problems that are conveyed are directly related to students' daily lives. So that the learning material conveyed by the teacher is not only remembered, but with the Discovery Learning model the teacher can instill understanding and material concepts creatively and easily understood by students. It can be seen that the discovery learning model really helps students deepen learning because it creates learning activities that can make students actively discover their own knowledge (Dewantari et al., 2022).

Learning by involving students directly, for example students using, showing or demonstrating what students have learned can make learning more effective and can be stored longer in students' minds (Nur Khofiyah et al., 2019). Success in learning is achieved through direct experience carried out with learning activities, learning is carried out more realistically because it is motivated by direct interaction by students with real examples, which involve students directly in the learning process. As well as arousing student motivation in critical thinking skills by applying the discovery learning model.

Based on this explanation, learning using the Discovery Learning model assisted by realia media in this study has the advantage that using the Discovery Learning model assisted by realia media helps students succeed in receiving learning very well and learning with the Discovery Learning model assisted by realia media makes students remember the material better. what you have learned so you don't forget it. The learning process is also more focused and student-oriented so that it strives for students to improve their critical thinking skills.

The existence of learning media where the media is used as a tool for teaching and learning processes that can be used to stimulate thoughts, feelings, attention and abilities or skills of learners (Falloon, 2020; Kristyowati & Purwanto, 2019). The use of media in teaching and learning activities, especially for the elementary school level is very important, because at this time students are still thinking concretely, and have not been able to think abstractly. The presence of the media really helps them understand certain concepts that are less able to be explained with language. The teacher's inability to explain something material can be represented by the role of the media. In addition, learning media can be useful in the teaching and learning process, namely learning media can clarify presentation, and attract students' attention, to improve learning processes and outcomes, generate learning motivation, overcome sensory, space and time limitations, and provide students with a common experience (Damitri & Adistana, 2020). Learning media can be used as a communication tool in the teaching and learning process so that the messages conveyed by the teacher are easy to understand (Antara & Dewantara, 2022; Astiti et al., 2021).

4. CONCLUSION

Based on this discussion, it can be concluded that there is a significant difference in the Critical Thinking Ability of the group of students who are taught with the Discovery Learning model assisted by realia media and the group of students who are not taught with the Discovery Learning model assisted by realia media for fifth graders of elementary school. The theoretical implications of this study prove that the Discovery Learning model assisted by realia media makes a good contribution when applied to science learning, then practically the results of this study can be used by teachers in carrying out learning activities or processes at school because this Discovery Learning model has an influence on students' critical thinking skills.

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