RESEARCH ARTICLE

The Effectiveness of Discovery Learning with Loose Parts in Increasing Student Interest and Activity in Science Learning

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ABSTRACT

Problems that often arise are the lack of understanding in implementing innovative learning models, which makes students quickly bored and have difficulty understanding the material. This study aims to analyze the effectiveness of the Discovery Learning learning model with loose parts media in increasing students' interest and activity in science learning. The method in the study used a quantitative approach to quasi-experimental design. Data were collected through observation and documentation. The results of the study showed that the application of Discovery Learning with loose parts media significantly increased students' interest and learning activity in science learning. The use of this method is effective in creating an interesting learning environment, and is able to contribute to improving student learning outcomes. The results of the hypothesis test between the two groups prove that loose parts of the media can affect the ability to understand the Nature of Science and Scientific Methods.

Keywords: Discovery Learning with Loose Parts, Student Activity, Student Interest

INTRODUCTION

Learning effective is one of factor main achievement objective maximum education . Learning effective can be realized if participant educate own interest Study to field studies taught (P., 2019).) . KBM with strong attention tend to be more successful And own level success Which higher . As a teacher , educator should always trying to design such learning appearance so that can interesting attention students and make they interested to lessons taught . (Rahmi et al., 2020).

On learning Knowledge Knowledge Nature (science), achievement objective learning No only can measured from so far where participant educate can control concepts scientific , but Also measured from so far where participant educate can develop interest And skills think critical . Besides That, Knowledge Knowledge Natural Alone own 4 element main , namely attitude , process, products , and application (Wulandari, 2016). Method learning Which applied should can develop interest And activity participant educate in learning Science. Wrong One method learning Which can applied is Discovery Learning (Learning Discovery). Method This centered on learning active Where participant educate will faced with with problem

or situation Which require they For search and find answer Alone , so that that matter can push they For can involved in a way direct when process Activity Study Teach in progress (Tampubolon, 2018).

Discovery learning is an active and direct learning method that was initiated by Jerome Burner in 1960. Bruner stated that learning must be carried out while doing or *learning by doing* (Bruner, 2020). By providing students' freedom to explore , they No only get stronger knowledge but of course it also creates a sense of greater interest and involvement in a way active during the learning (Sayangan et al., 2024)process . At science learning , methods This have great potential to improve activity the participants educate , this is because science as one of the fields studies rely heavily on experiments , observations , and applications concepts in real world situations (Adi, 2024). This process is called the cognitive process or the mental process of assimilating concepts and principles in the mind (Kemendikbud, 2015).

Discovery Learning is able to increase student involvement, because in this method students are involved to actively participate when looking for

solutions and understanding concepts more deeply, not just receiving information passively and centered on the teacher (Arsy Rohayunilla, Nurhayati B, 2023). Implementation method This in science learning can repair results Study participant educate with added value to create students are more interested and enthusiastic in explore the world of science , especially in the midst of challenge learning that tends to dominated by more conventional approaches , one of which is knowledge transfer via the internet .

Various research also revealed that *Discovery Learning* is able to facilitate various development skills in think critical , creativity , and problem solving problems with participants educate . In addition , the method This give chance for participant educate to learn through experience directly , which in its success can increase understanding and retention information (Khasinah, 2021). Study similar is also carried out by researchers previously with results Model learning discovery learning in science can increase results Study student proven by the existence of increasing data results Study student (Juhri, 2020). However the research only focus on results Study students , no focused on interest students who are part of the learning process . So from that the author want to researching Interest learning and activities student in science learning with methods *Discovery learning* .

Article This own purpose of studying effectiveness learning Which use method *Discovery Learning* to improve interests and activities student in science learning . Through method This , expected student No only understand science material with more deep , but Also can more active to get involved direct in the teaching and learning process Which can grow flavor want to know and sharpen skills scientific participant educate .

METHOD

Study This aims to analyze effectiveness learning *Discovery Learning* in increase interests and activities students in the eye lesson Science. Method study Which used is approach quantitative with design *quasi-experimental* . Experiment This is form a design two group , one group is group experiment and other groups are control group (Kholiyah et al., 2023) . Research Design Model This is design *quasi-experimental* .

In design , when compare group experiments with control groups , samples were taken randomly sequentially and secondly the group underwent pretest , then treatment last (post-test). Thus , the results study can known correctly , seen from comparison results before and after treatment . Step - steps in research method quantitative use design *quasi-experimental* is in the table below This :

Table 1. Research Design

Group	Pretest	Treatment	Posts
Experiment	Y_1	X	Y_2
Control	Y_2	-	Y_4

Information :

E : Group experiment (group that get method *Discovery Learning* with *loose parts media*)
K : Group Control (group No get method *Discovery Learning* with *loose parts media*)
Y_1 : Before exam taker group experiment
Y_2 : After exam taker group experiment
Y_3 : Before exam taker control group
Y_4 : After exam taker group control
X : Experimental Class that received treatment with method *Discovery Learning* with *loose parts media*   Population in study This there is all over students of MUSASI Middle School, Sidoarjo with a total of 67 students . The sampling technique sample used is design *quasi-experimental* . The way to use *Quasi-experimental* media is by sorting samples that are in accordance with the considerations criteria specific samples and characteristics . Therefore That, on study This criteria Which used that is students from class VII of MUSASI Middle School, Sidoarjo or group A in class 7ECP2 as many as 33 students as group experiment and class 7ECP1 as many as 34 students as group control .

Method data collection in study This based on use method observation and documentation . Methods observation use guidelines as tool collection data data collection , methods observation this is to observe understanding in understand the material given in the chapter The essence Knowledge Science and Methods Scientific . In chapter The essence Knowledge Science and Methods Scientific , focus observation in study This consists of from several factors , namely : (a) Laboratory equipment and (b)

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Reading tool measuring as well as Count magnitude units (length units and units weight). Criteria evaluation provided for each grid indicator to support assessment . Criteria assessment used in study This namely *Scale Branch* in form *checklist* with scale evaluation 1 For BB (Not Developed), value 2 for MB (Starting Developing), and a value of 3 for BSH (Developing) As Expected). Before data collection , research instruments moreover formerly tested to ensure that instrument Which used to measure variables have validity and reliability that are in accordance with the provisions (Kholiyah et al., n.d.).

Measurement validity instrument research with use formula PPM *Pearson Product Moment* (PPM) use software IBM SPSS *statistics* 22, stated valid if mark R. Count >R. Table . Testing reliability done by using formula *Cronbach's Alpha* . After the data is proven valid and reliable, then qualification test conducted namely the alignment test and the normality test . Alignment test conducted using the OWA *(One Way Anova)* test with the condition determination distribute own harmony if mark sig. result > 0.05 and normality test done with determine test SW *(Shapiro Wilk)* with criteria if own results normal If sig.> 0.05. Furthermore results data analysis is useful for determining whether the impact from *loose parts* media to ability understand The essence Knowledge Science and Methods Scientific , analysis used is a sample t test groups with significant levels α=0.05 .

RESULT

Method observations used in research This is by observing understanding in catch material given in the chapter The essence Knowledge Science and Methods Scientific in class VII JUNIOR HIGH SCHOOL MUSATION Sidoarjo . Before data collection , researcher test instrument research to ensure that instrument Which used For measure variable have validity as well as reliability regulation . Test results validity item with formula *Pearson Product Moment* with IBM SPSS *statistical software* 22 is in the following table :

Table 2. Validity Test Results Instrument Study

Statement Item Number	Mark R.Count	Mark R. Table	Results
X_1	0.382	0.361	Valid
X_2	0.312	0.361	Invalid
X_3	0.542.	0.361	Valid
X_4	0.115	0.361	Invalid
X_5	0.139	0.361	Invalid
X_6	0.831	0.361	Valid
X_7	0.670	0.361	Valid
X_8	0.558	0.361	Valid
X_9	0.564	0.361	Valid
X_{10}	0.776	0.361	Valid
X_{11}	0.781	0.361	Valid
X_{12}	0.688	0.361	Valid
X_{13}	0.782	0.361	Valid
X_{14}	0.759	0.361	Valid
X_{15}	0.652	0.361	Valid
X_{16}	0.481	0.361	Valid
X_{17}	0.641	0.361	Valid
X_{18}	0.597	0.361	Valid
X_{19}	0.641	0.361	Valid
X_{20}	0.742	0.361	Valid
X_{21}	0.831	0.361	Valid
X_{22}	0.670	0.361	Valid
X_{23}	0.558	0.361	Valid
X_{24}	0.564	0.361	Valid
X_{25}	0.776	0.361	Valid

Based on table from validity test results instrument ability understand above , from 25 items Based on table validity test results instrument ability understand The essence Knowledge Science and Methods Scientifically , from 25 statement items used , 3 with item numbers 2, 4, and 5 are invalid . This is because r number < r. the size of the r table with the level significance of 5%, N=30 is 0.361. Then From that, 22 statement items were used in study is valid instrument that can used as tool data collection in class VII of MUSASI Middle School, Sidoarjo .

Reliability test results use formula *Cronbach's Alpha* against listed items in the instrument shows mark of 0.917. From here can concluded that this instrument capable understand The essence Knowledge Science and Methods Scientific with high standards . The results of testing reliability shown in Table 3.

Table 3. Reliability Test Results Instruments in Research Reliability Statistics

Cronbach's Alpha	N of Items
0.917	17

Following when done test harmony to understand similarity variance of data from samples that have been taken previously. Alignment test conducted using IBM SPSS *statistics* 22 software with testing *One-Way* ANOVA through pre-test results 0.825 > 0.05 and post-test 0.339 > 0.05. This means that the data in group experiments and controls are suitable and have been spread in a way evenly (Kholiyah) et al, 2023). Test results harmony There is in table under This :

Table 4. Results of the Alignment Test on the pretest *Test of Homogeneity of Variances*
Result of Laboratory Equipment Capability Chapter Material

Levene Statistics	df1	df2	Sig.
0.050	1	28	0.825

Furthermore when implemented test harmony to understand similarity variance of data from cited sample. Homogeneity test conducted using IBM SPSS *statistics 22 software with One-Way* ANOVA test with pre-test results of 0.825 > 0.05 and post-test 0.339 > 0.05. This means that the group data experiments and controls are suitable and have been spread in a way evenly (Kholiyah) et al, 2023). Test results harmony served in table under This :

Table 5. Results of the Alignment Test on the Posttest *Test of Homogeneity of Variances*
Ability results Read tool measuring as well as Count magnitude units (length units and units heavy)

Levene Statistics	df1	df2	Sig.
0.946	1	28	0.339

Significance value determined based on table results test harmony post test between group experiment with control group , namely 0.339>0.05. Can concluded that ability read tool measure and count quantities (length and weight units) have same variance or in tune with the group experimental and control groups after given treatment (post-test)(Kholiyah et al., n.d.).

Next , it is done testing data normality in order to checked whether the research data results distributed normal or on the contrary . Testing data normality with software IBM SPSS *statistics* 22 with testing *Shapiro Wilk* , in the pre-test and post-test in class experiment to obtain results 0.314 > 0.05 and in the pretest and posttest in the classroom control to obtain results 0.290 > 0.05. In this case This show that data is normally distributed . Test results harmony shown in the table below This :

Table 6. Results of Normality Test on Groups Experiment
Tests of Normality

	Group	Shapiro Wilk		
		Statistics	Df	Sig.
Ability results Getting to know laboratory equipment	Experiment pretest	,934	15	,314
	Posttest experiment	,956	15	,631

* This is a lower bound of the true significance .
   a. Lilliefors Significance Correction

Based on mark from normality test table *Shapiro Wilk* got significant results , by group experiment as much as 0.314 > 0.05 in the pre-test as well as in posttest as much as 0.631 > 0.05. Therefore , it can concluded that mark testing normality from the pre-test and post-test data were normally distributed in the group experiment .

Table 7. Results of Normality Test on Groups Experiment
Tests of Normality

	Group	Shapiro Wilk		
		Statistics	Df	Sig.
Ability results know Laboratory Equipment	Experiment pretest	,932	15	,290
	Posttest experiment	,936	15	,330

* This is a lower bound of the true significance.
   a. Lilliefors Significance Correction

Based on from table results testing normality *Shapiro Wilk* acquired mark significance in the group control as much as 0.290 > 0.05 in pre-test as well as in post-test as big as 0.330 > 0.05. Can concluded that normality test value from pre-test and post-test data in group control own normal distribution .

In addition , testing hypothesis makes it possible to see consequence slow the influence of *loose parts* media on ability understand The essence Knowledge Science And Method Scientific . Testing Hypothesis done in order to find out results compare results test (post-test) group experiments and groups control . Testing hypothesis done technique analysis t-test with *paired sample* t-test sample in pairs with level significance α= 0.05. Test results hypothesis shown in the table under This :

Table 8. Hypothesis Test Results on Groups Experiment
Paired Samples Test

| | Paired Differences | | | | | | | |
| | | | | 95% Confidence Interval of the Difference | | | | |
	Mean	Std. Deviation	Std. Error Mean	lower	Upper	t	Df	Sig. (2-tailed)
Pair - pretest								
Post - test group experiment	-4,80000	2,17781	,56231	-6,06603	-3.59397	-8,536	14	,000

Paid samples statistics

	Mean	N	Std. deviation	Std. Error Mean
Pair 1 Group pretest experiment	35,4667	15	5.55321	1.43383
Pair 1 Posttest group experiment	40,2667	15	4.69752	1.21289

Based on table data hypothesis test results in the classroom experiment seen difference Which

significant . Can seen that The displayed value sig . (2 *according to*) is 0.000 < 0.05 and the average value of the group experiment was 35.46 before treatment (pre-test) and 40.26 after treatment (post-test). Therefore , H0 is rejected and Ha is accepted . This means If processed with *loose parts media* then ability in understand The essence Knowledge Science and Methods Scientific will own influence .

Table 9. Results of Hypothesis Testing on Groups Experiment
Paired Samples Test

| | Paired Differences | | | | | | | |
| | | | | 95% Confidence Interval of the Difference | | | | |
	Mean	Std. Deviation	Std. Error Mean	lower	Upper	t	Df	Sig. (2-tailed)
Pair-pretest								
Post-test group Control	-,26667	,70373	,18170	-,65638	,12305	-1,468	14	,164

Paid samples statistics

	Mean	N	Std. deviation	Std. Error Mean
Pair 1 Group pretest control	35,0000	15	5,78174	1.49284
Pair 1 Posttest group control	35,2667	15	5,7254	1.47831

Based on from hypothesis testing in table in groups control also has difference , will but No significant . This is because in groups control No given *loose*

parts media will but generally using LKA. In the group control to obtain mark sig.(2 tailed) as much as 0.140 > 0.05 with the *mean* obtained as much as 35.00 and the results end obtained mark *mean* of 35.26. Therefore , H0 is accepted and Ha is rejected . This means that ability in understand The essence Knowledge Science And Method Scientific use media LKA does not own influence .

Figure 1. Condition of Class 7ECP1 and 7ECP2
Source : Documentation

Test results hypothesis between pre-test and post-test of group experiment with groups control show that *loose parts* media can give influence to ability understand The essence Knowledge Science and Methods Scientific in class VII SMP MUSASI Sidoarjo . In particular , the group experiments that have been given treatment If compared to the group control that only applying LKA media.

DISCUSSION

Learning *Discovery Learning* has proven effective develop interests and activities students , especially in science learning (science) Knowledge Nature). Based on results from research that has been done , some matter can concluded about impact and implementation method This :

1. Improvement Interest Student
2. Improvement Activity Student
3. Development Skills Cognitive and Metacognitive
4. Challenge in Implementation
5. Conclusion

Thus , Discovery *Learning is* a promising alternative to improve quality science learning at school , provided balanced with adequate support from party school And effort improvement capacity Teacher .

CONCLUSION

Based on results research , can concluded that learning with a Discovery *Learning* approach proven effective in increase interests and activities student in science learning . Some conclusion main thing to get from study This is as following :

1. Improvement Interest Student
   Learning *Discovery Learning* can to awaken interest student to science material Because approach This give chance to students for for active learn , find his knowledge yourself , and connect theory with experience direct . Interest student increase when they feel involved in the process of search and discovery .
2. Improvement Activity Student
   Through the *Discovery Learning* model , students are more involved in activity practical work , experiments , discussions groups , and breakdown problem . Activity student in learning become more dynamic Because they given opportunities to explore , interact and collaborate in find solution or answer from questions that have been they submit .
3. Development Skills Cognitive and Social
   Learning *Discovery Learning* does not only increase understanding on science concepts , will but also helps student in develop skills cognitive (such as think critical , analytical , and problem solving a problems) and skills social through interaction in group . Students invited to be more reflective from what have they done learn and control the learning process they Alone .
4. Challenge in Implementation
   Although effective , success Discovery *Learning* relies heavily on thorough preparation , incl provision tools and resources Power Which support experiment , as well as teacher competence in manage learning processes based on discovery . Required development

professional for teachers to be able to facilitate the learning process well .

5. Recommendation

To maximize effectiveness *Discovery Learning* , recommended so that Teacher trained in implementation model This , as well as school provide supporting facilities activity practical work and experiments . In addition , collaboration between teachers, students , and parents is also important done to create an environment that supports a more interactive and meaningful learning process .

Thus , Discovery *Learning* is method Which effective in increase interest and activities student in science learning , and can become a good alternative to create learning Which more interesting And meaningful for student .

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DECLARATION OF POTENTIAL CONFLICT OF INTEREST

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