



## The Influence of *Guided Discovery* Model with The Respiratory System Practicum on The Students' Learning Outcomes and Conservation Attitudes

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### Abstract

This research purpose is to find out the application of Guided Discovery model with the practice material learning system to the learning outcomes and character of junior high school students. This research belongs to quasi experimental research with nonequivalent control group design. Population includes all students of class VIIIA to VIII of SMP Negeri 1 Watukumpul with VIIIB class as an experiment class and VIIIA as control class determined by purposive sampling. The t test results showed a significant posttest average difference between the experimental and control classes. The improvement found on 31 students in experimental class (medium-high), while only 18 students in control class have improved (medium-high). The highest average of experimental class found on the honest character which is 89.10, while 78.92 for the environmental care and 78.39 for the aspect of responsibility, better than the control class which is 78.00 for honest character, the environmental care is 76, 38, and the character of responsibility is 80.09. That findings showed the Guided Discovery model give the positive learning outcomes and student conservation characters. It is well supported by students and teachers on the application of the Guided Discovery model on the teaching of the respiratory system.

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## INTRODUCTION

Education is the way to improve the value of individual character. Related to that statement, good planning is really needed in order to increase the quality of the education in Indonesia. Mareasari (2013) states that one of the things which needed is the feedback between the teacher and the students. One of the factors of successful educational system is the teacher itself. The used of necessary model and media become the main factor to support learning process. The regulation of Education and Culture Ministry number 103, 2014 states that scientific approach is suggested for the learning process in curriculum 2013 implementation. One of the scientific approaches is *Discovery Learning*. There should be a necessary guidance for the implementation in junior high school students, so the model which chosen is Guided Discovery Learning.

*Guided Discovery* is a learning to found something, it means that it come from the simple thing but it has a meaning for the students (Kosasih, 2014). Learning process begin when the teacher started give some question which has purpose to give the directions or instructions for the students to the certain conclusion, and then the students do the trial to prove the statements which have been stated. Steps for doing *Guided Discovery Learning* are: (1) stimulation, (2) statement of the problem, (3) collecting the data, (4) data analysis, (5) verification, (6) conclusion (Hosnan, 2014). The advantages of this learning process are (1) develop the mastery of the student's skill in cognitive aspect (2) support the knowledge of finding process; (3) increase the students learning passion (Suryosubroto, 2009)

Result of the research trial in SMP Negeri 1 Watukumpul showed that science learning especially on biology subject, the students got difficulties in understanding the material. It showed by the fact that

50% of student didn't reach the requirement of the score. The material delivery just using the text books even without using any books. It made the students not interested to the learning process. Meanwhile, the teachers said that they have trying to make an active learning by give the methods of discussion and Q&A, but there were a lot of students still do unnecessary things outside the learning process. Less of practice in laboratory become another problem. So, using a simple practice in a respiratory system material will make the students interest to the process of learning. Junior high school students still need some guidance in practice learning, so *Guided Discovery Learning* become the solution.

People always have interaction either to the nature or to the other people. Those things needed a value also the norm to keep their life. Value of conservation through conservation learning reputed as the important thing to be taught to the students, it can be seen from the learning concept as a process of making a good mindset, so the moral values in somebody will be created and integrated to his point of his life (Hardati *et al*,2016). UNNES have taught the character of conservation that are religious, honest, intelligent, fair, responsible, care, tolerant, democracy, patriotism, strong and polite (Bangvasi,2015). The main point of conservative learning in respiratory system material has a purpose to make the students honest and care to their environment.

Practice learning is a process which the students can observe and pay attention to what the teacher served along the process of the learning. The purpose is to make the students able not only understanding but also comprehends many phenomena which happened in science, and also fix the misconception for the students cause the students able to know the truth based on the real case (Atnur *et al*, 2014). Practice learning will improve the student ability. The students will experience the learning, follow the process, observe, analyze, prove and get the conclusion about the object or process itself (Rahman *et al*, 2014). Practice learning also could be done with the format of *discovery*, so the facts which have been analyzed became the base part in their idea.

Character education is mentioned as value education, moral education, nature education which aims to develop students' ability to be able to build good habits and students become aware of what is right and wrong and they are accustomed to doing that (Ridlo, 2012). The implementation of character education systematically and sustainably will raise the children become intelligent dealing with his emotions to go after their future (Lepiyanto, 2011). The nature of conservation in the learning of respiratory system material aims in order the students are accustomed to behaving environmentally and honestly. By honesty attitude, the students are prepared to become confident, thorough and precise citizens. Environmental care encourages students to carry out local and global conservation and real action movements on the environment.

In this study, new innovation is carried out by combining the two models. The latest innovation is *Guided Discovery* with practicum, in the implementation of that learning is carried out through students learning independently through simple practicums and constructive question and answer in the concept discovery process. In finding the concept, the students do observation, classification, make hypotheses, explain, draw the conclusions that is guided by the teacher. *Guided Discovery* models learning with practicum that will be applied to the students of junior high school make the students in learning the respiratory system not to memorize the concepts but build their own knowledge so that it can improve learning outcomes.

Based on the problem mentioned above, the researcher tries to conduct the study on the influence of *Guided Discovery* model with the respiratory system practicum on the students' learning outcomes and conservation attitudes

## **METHOD**

The method which is used in this study is experimental quasi with nonequivalent control group design. The population in this study is all the students of VIII A up to VIII D class in the academic year of 2017/2018. The samples are VIII B class as experimental group and VIII A class as control group, they are taken by purposive sample technique and are chosen by the teacher which are considered to have the same level. The data will be taken from the two samples by doing pretest to know that the two samples are from the same condition. On the other hand, in the end of the learning will be given posttest to measure the successful result of the students. The posttest result will be tested by t-test to know whether there are significantly differences in the result of experimental group and control group. The improvement of learning outcomes will be counted by N-Gain. Meanwhile, the assessment of students' conservative character will be tested through observing and self-testing. The supported data includes affective score, skills score will be also compared to the two classes. In addition, there are the data of students' response and teachers' response

## **RESULT AND DISCUSSION**

This study is conducted in SMP Negeri 1 Watukumpul in the academic year of 2017/2018 on respiratory system material. The results are discussed as follow:

### **Students' learning outcomes**

The assessment of student' ability of knowledge mastery gained the posttest scores. The posttest scores of experimental group and control group were analyzed by t-test because the data of posttest scores were normally and homogeneously distributed. T-test analysis was done in the level of significance 5% by using 22 version SPSS with independent sample test statistic. The results are presented in the table 1.

**Table 1** T-Test of Posttest result from experimental and control group

	Experimental group	Control group
The average	81,11	67,22
The highest score	95	80
The lowest score	65	55
Standard Deviation	1,67	1,67
Total of students	36	36
<i>Sig. (2-tailed)</i>		0,00
Description	P 0,00	0,05, Ho is rejected

Based on the table above, the average score of posttests of experimental group is better than the control group and  $p\ 0,00 < 0,05$  so that  $H_0$  is rejected ( $H_0$  = There is no difference in the ability of knowledge material between control group after learning). This shows that the average of posttest scores of experimental group and control group has significant difference, thus the learning of *Guided Discovery* model with practicum influences significantly on the students' ability of knowledge on respiratory system material based on N-gain, the improvement of learning outcomes of experimental group are 0,54, the total of the students are 31 with medium up to high criteria. Meanwhile, the average of learning outcomes of control group is 0,31 with the medium up to high criteria is only 18 students. Besides the improvement of students' learning outcomes, the minimum mastery criteria of experimental group are better than control group, in experimental group, the students have reached the minimum mastery criteria of 86 %, whereas the control group includes 55% of entire students in the class. Based on that data can be known that *Guided Discovery* model with practicum influences positively on the students' learning outcomes. The data claimed that 94,47 students said that the learning agreed with *Guided Discovery* syntax with practicum, this shows that the learning has been agreed with *Guided Discovery* model with practicum.

The difference of learning outcomes between experimental group and control group emerged because there was the different behavior which was given to both groups. The implementation of *Guided Discovery* model with practicum of experimental group trained the students' ability to look for their own knowledge. The students were doing the practicum following the worksheets guidance based on *Guided Discovery* where the students would follow the written steps in the worksheets, after that, the students would do the discussion to get the concept. *Guided Discovery* has stimulus that is there is the problem stimulus which enables the students focusing on what they will learn, next there will be problem identification, in this stage the students will make the questions because of the stimulus. Then the data collection, in this stage, the students will collect the data or information, the data will be processed or analyzed, the last stage is drawing the conclusion from the discussion. The stages which have been through make the questions gradual indirectly, they are gained from the students' own mind, then they are integrated with other students, finally the concepts or knowledge are gained

*Guided Discovery* learning with practicum became more effective by discussion activity, learning with peers made them easier to express their own mind and opinion each other related to the experience that they got in practicum. Whereas the implementation of *Guided Discovery* with practicum created the learning environment where the students would get the concept and concrete experience by grouping with other students so that it made easier for them to remember the material. Zaini (2010) stated that the ability to remember by finding its own concept can stay longer than listen to others. Whereas the ability to memorize causes the students less able to apply the knowledge to the real life and to solve the problem (Sugiarto, 2004).

When the students were taught *Guided Discovery* model learning with practicum, firstly they seemed confused because that was the first time for them to do the simple practicum. Then the shy students who engaged in the group became more familiar with their own group gradually. That was due to the students' activity of the group. The students seemed enthusiastic to do every single practicum following the teacher's guidance, this proved that the students started being interested in this learning. This was also supported by the students' response which claimed that 100% students felt interested in joining the learning with that model.

The students were not courageous to ask for questions as Candra (2013) stated in his study that when there was an opportunity which was given to the students to ask for questions, many of them did not use that opportunity because they felt shy either to their friends or to their teacher. However, then the students became courageous in conveying their questions and opinions either to their peers or to their teacher. This agreed with the students' response, 100% students claimed they would discuss with their friends that is if there was the difficulty to understand the material that was conveyed by the teacher. Some students also struggled against others to answer the questions of the teacher. This proved that the students were motivated to get the score. Based on the questionnaire of students' response claimed that 100 % students were motivated and interested in joining the learning. The results were in line with the study conducted by Lavine (2005) showed that *Guided Discovery* could grow the motivation so that the information could be mastered.

In control group used the general discussion without practicing. The same group with experimental group is group 5 consisting of 7-8 students, however in the discussion and participating the learning, there were just few students who tend to be active. Most of the group relied on one until two members of the group, on the other hand, other members were passive. Even being silent in outside the classroom resulted in the lowness of students' outcomes.

### Conversation Character

The assessment of student's conservation character is tested by students' self-testing. This is because the aspect which is tested is character or nature, so that is the students themselves who know the value of honesty, responsibility, and environmental care. The assessment of two classes has the different score, in experimental group, most of the students who care about the environment are 78,92 with the good criteria. The honesty character is 89,10 with the excellent criteria, meanwhile the responsibility character has 78,39 with the good criteria. On the other hand, in the control group the criteria of environmental care are 76,38 with the good criteria, honesty character is 78,00 with the good criteria, and the responsibility is 80,09 with the good criteria.

**Table 2** The assessment result of conservation character of experimental group and control group. The results are presented in the table 2.

Criteria	Experimental Group			Control Group		
	Environmental care	Honesty	Responsibility	Environmental care	Honesty	Responsibility
Excellent (A)	15	28	13	14	18	16
Good (B)	16	6	15	13	14	20
Less good(C)	4	1	7	9	4	0
Bad (D)	0	0	0	0	0	0

Total of the students	36	36
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Table 2 showed that the students of experimental group have the better conservation character than the students of control group. That is supported by the total students of each character in experimental group which is higher than in control group, but it is different from responsibility where the control group is better.

The assessment of experimental group tested the students' practicum on how the conservation character was shaped from the practicum itself, eventually the result is excellent, all characters are categorized into good criteria. In the environmental care criteria, 95% students said that they used the water based on their needs, meanwhile 48% students did not turn the lamp off after using it. This was because when the practicum was running had not been done in the real laboratory, it was because the room was dirty and many stuffs inside. In the honesty character, 90 % students said that they did the questions on the worksheets based on the result and 89% students gave back the equipment and material to the previous place, meanwhile in the responsibility character, 87 % students said that they cooperated with other students in the practicum and 77% students did not tidy up the equipment and material after using them, that was because they only had the limited time off so that most of the students went outside without fixing the equipment and material. According to Hardati et al (2016) stated that the honesty character includes the encouragement to say what is true and untrue, working based on the rightful authority and obligation is one of the actions of responsibility, and be aware of damaged environment.

During the learning in experimental group, most of the students did what they should did, this was because of their behavior. The examples where they tidied up the chairs and tables after discussing, threw away the useless stuff. *Guided Discovery* learning with practicum contained the value of students' conservation character, as the result; if the students followed step by step of learning, the students could apply discipline character, responsibility, and environmental care. They have adhered to the students to take care of the environment, fix up, and discipline. Exactly those characters were taught by their parents, environment, and school, so that the students have the good conservation character.

In the control group using speech and discussion method will be seen how deep the students' conservation character was. These are the assessment of conservation character of control group in the learning process. 80,55% students got rid of the useless papers to the dustbin, and 68% students used the papers based on their needs. 90,97% students answered the questions on the worksheets based on the result, 70,33% students cheated their friends on making the report. 89,58% students tidied up the tables based on the needs and 69,4 % students did not take part in finishing LDS. However, the conservation character of control group was shaped with the good score

The different score between experimental group and control group happened because there was the difference in learning. In experimental group, the students were guided by the teacher to do the practicum. Meanwhile, in the control group, the students discussed each other and the teacher explained to them. *Guided Discovery* with practicum aims in order the students keep being guided by the teacher in doing the practicum by worksheets (LKS). Whereas the aim of this learning is in order the students get new knowledge to be integrated with the previous knowledge, so it will shape new concept. The advantages of this practicum are the students can involve their physical, mind, and emotion so that can improve the learning outcomes, the students become more skilled not only in the cognitive but also in doing practicum, they develop the motivation and confidence because the students will be convinced with their discovery.

## CONCLUSION

Based on the analysis result data and result discussion, it can be concluded that the guided discovery model learning with practicum on respiratory system influences significantly on the learning outcomes and students' conservation. This was proved by the result that there are the different learning outcomes between experimental group and control group. The number of the students who have the improvement of learning outcomes which are categorized into medium to high in experimental group are more than in control group. While in the students' conservation character, all classes are categorized into good and the average of conservation character of experimental group is higher than control group.

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