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## The Implementation Effect of Discovery Learning Model for Non-Formal Education Student

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### Abstract

The problem in non formal education is the low motivation to learn, so teacher need to overcome the problem with creative and innovative learning. This purpose of study is implementation discovery learning model for non formal education in wich discovery learning model is one that giver opportunities to students find any information about knowledge without help from teacher on the nonformal education especially chemistry class of Paket C Programs. This research was a experimental study. Data collection techniques in this study include tests, observation, documentation and interview. The hypothesis of research used analytical techniques independent sample T-Test with a level 0.05 level and SPSS version 10. The result showed that the reliability test results are then compared with value  $r_t$  in this study  $N=20$  and  $dk=20-1=19$  with a significance level 5% so that values  $r_t=0.433$  are obtained . If  $r_a < r_t$  the item is not reliable and if  $r_a > r_t$  the item is reliable. As for The results of the reliability test calculation 0.926 so five item is reliable. The result of independent test sample t-test student learning outcomes known value of Sig. (2-tailed) is 0.011. Based on criteria decision making  $0.011 < 0.05$ , then rejected and accepted. So that there is the influence of discovery learning methods on chemistry learning outcomes. with discovery are student who makes discovery learning is better than student make conventional learning. Teachers who implementating discovery learning can create a high quality learning.

**Keywords:** Discovery Learning, Innovative, Non Formal Education

### Introduction

Various efforts to improve the education system and its equipment in Indonesia continues to do so. Professional skills of teachers are very important for improved in order to improve the quality of education. Repair activities in the teaching and learning process is one form of change activities others. Changes can be made in terms of teaching methods, books lessons, laboratory tools, and subject matter. Learning in non formal education there are still problems in achieving learning goals. Chemistry is the science of learning about systematic symptoms so that

chemistry learning is not just for mastery of the collection of knowledge in the form of facts, concepts or principles it is also a process discovery, so students are required to can think critically and creatively. A form of scientific product, scientific process, and scientific attitude must displayed in chemistry learning. Students should be given the opportunity to prove the truth of existing theories and given the opportunity to find something new by discussing, conduct investigations, and work together. Learning of chemistry nowadays often experiencing problems caused by students who tend to be passive in class. The use of media is minimal and lacking interesting to make students engrossed with own activities. Besides that, until then this teaching and learning activities in class still teacher-centered. Based on observations made on February 2, 2018 in chemistry learning class of Paket C program is still dominated by the teacher centered. More students keep quiet and rarely ask the teacher. Students are also less active in argue or convey their ideas in class discussions or in group discussions, some students are more often crowded and not participating group discussion. This results in students' collaboration skills as well less able to develop properly (Handoko, Sajidan and Maridi, 2016). To increase activity and maximize achievement of learning outcomes chemistry learning, the teacher should choose learning model that corresponds to purpose and subject matter. According to the research from Indrawati, (2011), learning model function to help and guide the teacher to choose process component in learning techniques, strategies, and learning methods so that learning objectives can be achieved. One alternative solution in the process expected learning capable directing active students so that it can affect activity students, learning outcomes and retention of learning outcomes students towards chemistry learning is discovery learning learning model. According to Winataputra's (2007) research, Discovery learning consists of six stages namely: (1) stimulus, (2) identifying problems, (3) data collection, (4) data processing (5) verification, and (6) generalization. Learn the discovery emphasizes thinking high level, this is one capabilities developed when study of chemistry class. According to research of Trianto (2009), student worksheets is the student guide used to carry out investigative activities or problem solving. To overcome students' difficulties in working on essay questions, abilities are needed multi representation that must be owned every time students. Saolika et al (2012) stated that representation is a configuration that can describe, represent or symbolize something in a way. According to Mahardika's (2012) research multi representation is a a way to express a concept through various ways and forms. As for the form or method in question is verbally, mathematically, image and chart.

Learning is also still done teacher centered so that the involvement of students is deep learning is not optimal. When doing lab work, there are still many students who do not work in completing their tasks are like each other kidding, toy alone, and hanging the work to friends they think smartest. In addition, during the group learning process the ability of students to cooperate less well. Some students are more often joking and not participating in group discussions, such as when doing questions in groups only a part of students work, cooperate, and ask each other questions in solving the problem. Students look more working individually. This resulted student collaboration skills are not well developed even though Cooperation skills serve to facilitate work and tasks. According the states that the role of work relationships can be established by developing communication between group members. The role of the task can be

done by dividing the duties of group members. 3 models is meant to be a connected model, a profit-net model (webbed), and integrated model. Non-formal education plays a role in resource development humans in this country. A lot of non-formal education has been done community empowerment, but this great work seems not never resolved. It's as if this work is like a spinning circle naturally according to patterns that have been patterned. For this reason, in this paper discussed concepts related to non-formal education programs and participatory learning method. In this paper, many discuss about non-formal education and participatory learning methods, strategies development of non-formal education, and non-education development system formal. Coombs said, non-formal education is every organized and systematic activities, outside the established schooling system, carried out independently or is an important part of more activities broad, deliberately done to serve certain students (Jalil, 2016; Wahjudi, 2015).

### **Discovery Learning**

Discovery learning method is a method of teaching that regulates teaching in such a way that the child acquires knowledge that he has not previously known is not through notification, partially or wholly found alone. In discovery learning activities or learning that are designed in such a way that students can find concepts and principles through their own mental processes. In finding concepts, students observe, classify, make guesses, explain, draw conclusions and so on to find some concepts or principles. Discovery method is defined as a teaching procedure that emphasizes teaching someone, manipulating objects before reaching generalization. While Bruner stated that children must play an active role in learning (Astuti, 2013).

Further stated, the activity needs to be carried out through a method called discovery. Discovery carried out by students in the learning process is directed to find a concept or principle. Discovery is a mental process where students are able to assimilate a concept or principle. The mental processes in question include: observing, digesting, understanding, classifying, making assumptions, explaining, measuring, making conclusions and so on. With this technique students are allowed to find themselves or experience their own mental processes, the teacher only guides and gives instructions. Thus discovery learning is a learning that involves students in the process of mental activities through brainstorming, by discussing, reading by themselves and trying themselves, so that children can learn by themselves. Discovery learning method is a teaching method that focuses on student activities in learning. In the learning process with this method, the teacher only acts as a mentor and facilitator that directs students to find concepts, postulates, procedures, algorithms and the like. Three main characteristics of learning to find are: (1) exploring and solving problems to create, combine and generalize knowledge; (2) student-centered; (3) activities to combine new knowledge and existing knowledge. Blake et al. discusses the philosophy of discovery published by Whewell. Whewell proposed a three-stage discovery model, namely: (1) clarifying; (2) draw conclusions induction; (3) verification of truth (Widiadnyana, Sadia and Suastra, 2014; Hasyim, 2010).

Discovery learning steps are as follows: identification of student needs; preliminary selection of principles, understanding of concepts and generalization of knowledge; material selection, problems / tasks; help and clarify tasks / problems faced by students and the role of each student; prepare necessary classes and tools; check students' understanding of the problem to be solved; giving students the opportunity to make discoveries; help students with information / data if needed by students; lead self-analysis with questions that direct and identify problems;

stimulates. Interaction between students and students; help students formulate principles and generalize their findings. One method of learning that has recently been widely used in advanced schools is discovery methods. This is because this method: (1) is a way to develop active student learning methods; (2) by finding and investigating the concepts themselves learned, the results obtained will be long lasting in memory and not easily forgotten by students; (3) the notion found alone is an understanding that is truly mastered and easily used or transferred in other situations; (4) by using discovery strategies children learn to master one of the scientific methods that can be developed by themselves; (5) students learn to think analytically and try to solve problems faced by themselves, these habits will be transferred in real life. Some learning benefits of discovery are: (1) knowledge lasts a long time and is easy to remember; (2) discovery learning outcomes have a better transfer effect than other results; (3) Thorough learning discovery improves student reasoning and the ability to think freely. Specifically learning discovery trains students' cognitive skills to find and solve problems without the help of others. Some of the advantages of the discovery method as follows: students are active in learning activities, because they think and use the ability to find the final results; students understand the lesson material properly, because they experience the process of finding it themselves. Something gained in this way is remembered longer; find yourself causing satisfaction. This inner satisfaction encourages wanting to make more discoveries so that the interest in learning increases; students who gain knowledge with the discovery method will be better able to transfer their knowledge to various contexts; this method trains students to learn more by themselves (Indrawati, 2011; Kurniawati, 2011; Trianto, 2009).

### Methodology

The method that used in this study is quantitative method with experimental approach. According Sugiyono's (2012) research experimental research has treatment, impact measurement, experimental units. The study there are the experimental class and the control class. The experimental class is the class taught by using discovery models with multipresentation. The controll class is taught by using konvensional model (teacher centered learning). This research carried out on February until October 2018. The research subject were students of Citra Ilmu's Paket C Program class 3. Class 3A with 20 students be a experimental class respondent and class #B with 20 students as a control class. The design of study can seen on table 1.

**Tabel 1. Research design**

Class	Pre Test	Treatment	Post Test
Experiment Class	O1	X	Q1
Control Class	O2	C	Q2

Information :

X : the treatment of chemistry learning with discovery learning method

C : the treatment of chemistry learning with teacher centered learning method

O1 : the pre test of chemistry learning with discovery learning method

Q2 : the treatment of chemistry learning with teacher centered learning method

Q1 : the post test of chemistry learning with discovery learning method

Q2 : the post test of chemistry learning with teacher centered learning method

Data analysis techniques were conducted to assess the effect of treatment given to the class experiment. effectiveness of learning is determined based on the results of analysis of parametric testing data. Parametric tests are carried out through an independent test sample t-test using SPSS Static 10 on the posttest results. Independent test sample t-test is used to find out whether there are differences in the average effectiveness of learning in the experimental class and the control class. Basic decision making is: If the Sig (2-tailed) value is  $<0.05$ , then there is a significant difference between the experimental classes and control class; If the value of Sig. (2-tailed)  $> 0.05$ , then there is no significant difference between the experimental class and control class. Before the independent t-test sample is carried out, a homogeneity test and a normality test are carried out first using the static SPSS program 10. If the data in both samples is normally distributed and homogeneous then it can be continued independent test sample t-test. According Riduwan (2009) research reliability tests are used to test whether the instrument the data used is to consistently provide the same relative measurement results. Testing uses formulas Cronbach alpha.

## Result

Based from pretest, treatment and posttest questionnaire score, instruments validity with pearson correlation can seen on table 2.

**Tabel 2. Instrument's Validity**

Q=question		Q1	Q2	Q3	Q4	Q5	Total Score
Q1	Pearson Correlation	.841''	.854''	.897''	.851''	.634''	.945''
	Sig	.000	.000	.000	.000	.001	.000
	N	20	20	20	20	20	20
Q2	Pearson Correlation	.853''	.857''	.897''	.868''	.634''	.967''
	Sig	.000	.000	.000	.000	.001	.000
	N	20	20	20	20	20	20
Q3	Pearson Correlation	.654''	.678''	.897''	.851''	.634''	.897''
	Sig	.000	.000	.000	.000	.002	.000
	N	20	20	20	20	20	20
Q4	Pearson Correlation	.841''	.854''	.897''	.851''	.634''	.945''
	Sig	.000	.000	.000	.000	.001	.000
	N	20	20	20	20	20	20
Q5	Pearson Correlation	.841''	.854''	.897''	.851''	.634''	.942''
	Sig	.000	.000	.000	.000	.001	.000
	N	20	20	20	20	20	20
Total Score	Pearson Corr.	.889''	.982''	.768''	.678''	.834''	.809''
	Sig	.000	.000	.000	.000	.001	.000
	N	20	20	20	20	20	20

From table 2 we continue to calculate the value of reability ( $r$ ) that can seen on table 3. All items with  $r_a$  more than value  $r_t$ . This value  $r_a$  is then compared to the value  $r_t$ , in research. In this trial, researchers used 20 of these respondents with  $N = 20-2 = 18$  and the significance 5% level is obtained value  $r_t=0.448$ . If  $r_a < r_t$  the item is invalid and if  $r_a > r_t$  the item is valid. The results of the comparison between  $r_a$  and  $r_t$  and shown in Table as follows:

**Tabel 3. Comparison between  $r_a$  and  $r_t$**

Item of Question	$r_a$	$r_t$	
1	0.635	0.448	Valid
2	0.786	0.448	Valid
3	0.734	0.448	Valid
4	0.879	0.448	Valid
5	0.854	0.448	Valid

The reliability test results are then compared with value  $r_t$  in this study  $N=20$  and  $dk=20-1=19$  with a significance level 5% so that values  $r_t=0.433$  are obtained. If  $r_a < r_t$  the item is not reliable and if  $r_a > r_t$  the item is reliable. As for The results of the reliability test calculation 0.926 so five item is reliable.

**Hypotesis** :After the prerequisite test is fulfilled, the next is to test research hypothesis by conducting a comparative analysis of two samples independent (independent sample t-test). This analysis is used for knowing the effect of discovery learning methods on learning outcomes chemistry of third grade students Paket C Programs. This test is carried out with the help of the SPSS computer program 10.0. The hypothesis to be tested reads as follows:

$H_0$ : There is no significant influence of discovery learning methods towards student chemistry learning outcomes.

$H_a$ : There is a significant effect of discovery learning methods on student chemistry learning outcomes.

The basis for decision making is as follows:

- If the value is Sig. (2-tailed)  $> 0.05$ , then  $H_0$  accepted and  $H_a$  rejected.
- If the value is Sig. (2-tailed)  $< 0.05$ , then  $H_0$  rejected and  $H_a$  accepted

Based on data analysis and testing hypothesis about influence discovery learning model of activity and chemistry learning outcomes of the third grade students of Paket C Programs obtained research results:

- There is an effect of discovery learning learning model on activity student chemistry learning.
  - There is an effect of discovery learning learning model on results student chemistry learning
- Independent test of hypotesys shown in tables as follow :

**Table 4. Independent test of Hypothesis**

	F	sig	T	df	Sig(2-tailed)	Mean Difference	Std. Error Difference	95% confidence interval of the difference
Chemistry Learning Outcomes								
Equal variances assumed	.073	.768	2.674	41	.011	10.314	3.875	L=2.456 U=18.19
Equal variances not assumed			2.683	40.86	.011	10.314	3.869	L=2.492 U=18.13

From the output table independent test sample t-test student learning outcomes known value of Sig. (2-tailed) is 0.011. Based on criteria decision making  $0.011 < 0.05$ , then rejected and accepted. So that there is the influence of discovery learning methods on chemistry learning outcomes. After knowing the significant influence of

influence discovery learning methods for students' chemistry learning outcomes, the next step is to find out the influence of discovery learning methods towards chemistry learning outcomes using calculations effect size. To calculate the effect size used Cohen's formula, The results are as follows:

**Tabel 5. Cohen's Formula Result**

	Mean (M)	Deviation Standard (SD)	Cohen's d
Experiment Class	80.76	147.89	1.325
Control Class	70.42	169.74	

Based on the table above it can be concluded that the method Discovery learning has a high effect on results learning, evidenced by the value of  $d = 1.325$ . According to the table interpretation of the value of d or cohen's d, 1,325 is high. The sampling technique used was purposive sampling. Data collection is done by giving a test post for knowing student learning outcomes. Hypothesis testing is done by t-test. Results this study shows that 1) There is an



influence of the learning model guided discovery to the learning outcomes of chemistry material for the third grade students in Paket C Program, 2) Effect of guided discovery learning models of student learning outcomes included in category categorized as medium. based on data analysis and testing hypotheses about influence discovery learning model of activity and chemistry learning outcomes of the third grade students of Paket C Program obtained the results of the study: chemistry learning. There is an effect of discovery learning learning model on results student chemistry learning. Based on the information above, shows significant results because this is due to the use of learning models discovery learning is one part of learning discovery that involves many students in teaching and learning activities, but in the process of discovery students get help or guidance from the teacher, so that they are more directed so that the implementation process is good learning and the goals achieved are carried out well. The learning process affects the activity and learning outcomes student. By giving the model, it can lead to occurrence interaction in teaching and learning activities. This interaction can also occurs between students and students, students with teaching materials, students with teachers, and students with teaching materials and teachers. Interaction can also be done between students both in small groups and big groups. In carrying out activities or discoveries in groups -small groups, students interact with each other this interaction can can be in the form of mutual sharing or students who are weak in asking and explained by smarter students. This condition will be influential in addition to this on students' mastery of chemistry material, they will also be able to improve students' social skills, so that interaction is an aspect important in chemistry learning. And together students can solve the problem at hand.

### **Conclusion**

Based on the data analysis and results of the research there are differences in student learning chemistry with discovery learning and teacher centered learning models. Learning using the discovery learning model can be a reference for effective and enjoyable learning. Discovery Learning's learning process received a response positive. In general students state that learning is interesting and easy to do, guiding students in perform discovery, identify problems and draw conclusions. Overall interaction this can happen using the discovery learning, the possibility of constructing knowledge will become more big / possibility for students to arrive at conclusions expected, and students' understanding will be embedded in the minds of students in a relatively long period of time. The researcher applies the learning model that is in accordance with student characteristics, because this can improve learning outcomes higher, which is one of them by applying the discovery learning model which has a greater influence on activity and student learning outcomes, especially in the field of chemistry studies.

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