

Use of Practicum Learning Methods in Improving Learning Outcomes



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ABSTRACT: The purpose of this research is to find out whether the application of practicum methods can improve learning outcomes as well as to know how much the increase in chemistry is learning outcomes that are taught using the practicum method. The research method used in this study is a quasi-experimental design with two groups, a pretest and a post-test. Sample In this study, there were 56 students in class XI of 28 students as an experimental class and 28 students as a class control taken by purposive sampling technique. The research result shows that the significance value (Sig.) in the experimental class as well as in the control class of 0.000 is less than 0.05 ($0.000 < 0.05$). This means that practical and conventional methods, each used in the experimental and control classes, had a significant effect on students' chemistry learning outcomes. But based on analysis gain value, it is known that there was an increase of 31% in the class experiment and 12% in the control class. It can be concluded that increasing learning outcomes in the experimental class that apply the practicum method is better than the control class. .

KEYWORDS: Practicum learning method, learning outcomes, laboratories, experimental

I. INTRODUCTION

In an ever-changing society, ideally education is not orientated in the past and present but it should be a process that anticipates the future front. Education should look far ahead and think about what students will face in the future. According to Buchori (2001) in Khabibah (2006), that education What is good is education that does not only prepare students students for a profession or position, but for solve the problems it faces everyday life. But in reality there are still many students who have not been able to apply what they have learned in class. This can be seen from the learning outcomes of students who are still h low. Student learning outcomes are a description of student abilities in following the learning in class. Logically if the results learning in low grades of course students will have difficulty in apply what they have learned in everyday life. Basically there are many factors cause low student learning outcomes. One of which is use of learning methods in class. At this time there has indeed been a paradigm shift. The learning method that was originally expository changed to participatory, which was originally textual changed to contextual, learning that was originally centered on the teacher turned student-centered. The learning method implemented in some schools is still monotonous, namely using lecture method or conventional method. Learning methods conventional is felt to be less attractive to students, because teachers are authoritarian in class even though students have rights to express your opinion in your own way. should be more active in the implementation of learning but in reality the learning situation is still dominated by the teacher which in the end students are not able to learn independently independently through discovery and thought processes (Trianto, 2007) Based on the results of observations made at the high school where the research was conducted, the learning process in general was indeed still dominated by teachers. In particular, students' responses to the eye Chemistry lessons still seem difficult to learn. So motivation and interest in learning chemistry becomes low, in the end learning outcomes chemistry students at the school to be low. There are still some students who have not been able to associate chemistry subject matter with their everyday life. On the other hand chemistry teacher also required to pursue the subject matter so that teachers and student rarely do chemistry lab activities. Even though it's chemistry not only discuss the subject matter but must accompanied by practice. This is done so that more students understand and be able to relate it to everyday life. Therefore chemistry teachers need to try apply new learning methods to improve learning outcomes. The learning methods that can be used in Chemistry subject is a practical method. Practical method considered appropriate to be used in chemistry lessons because some of materials in chemistry subjects are abstract. With doing practicum activities students can see and experience directly so that students more easily understand the material abstract nature.

In addition, practical activities as well train students to think scientifically, be honest and work together. The results of Yulaida's research (2015) concerning the effect of the practicum method on motivation and learning outcomes in science class IV SDN Kemiri I Puspo Pasuruan shows that the use of practical methods significant effect on motivation and student learning outcomes. The results of Nasriani's research (2012) show that application practicum methods can improve student learning outcomes through use of the environment in class IV at SDN Baruga. Results Nurfaizah's research (2012) shows that the use of practicum methods have a

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significant effect on learning outcomes student mathematics on the subject of flat sided geometric shapes in class VIII SMPN 1 Cilimus, Kuningan Regency. Research result Cahyaningtyas (2015) shows that there is an increase learning activities of class VIII A students of SMP Negeri 1 Jelbuk on material material structure and function of tissues in plants and matter photosynthesis using practicum method and Rotating strategy Trio Exchange (RTE). Furthermore, the results of research by Anwar (2013) also shows that practicum-based learning on the concept of the circulatory system can improve learning outcomes and higher scientific work ability of students compared with conventional learning. Based on the background description above in order to improve the quality of student learning outcomes in chemistry subjects especially on the subject matter of colloids, it will be tried using the practical method. Therefore researchers try to conduct research on improving chemistry learning outcomes.

II. LITERATURE REVIEW

A. Practicum Learning Method

Definition of Practicum Method is the learning strategy applies the common Sketch activity teachers and students in realizing teaching and learning activities. learning strategy through practicum method is learning concepts that can help teachers connect between material taught with real-world realities of students and students to make interactions between existing knowledge has. Suparno, P (2007) explained that the practicum method is a teaching method that invites students to do activities an experiment to prove or to test a theory that has been learned does have the truth. Practical activities is an integral part of learning science so science is called experimental science. That matter agreed with the opinion of Sagala, S (2005) who explained teaching and learning process with practicum method means students given the opportunity to experience themselves, follow the process, observing an object, analyzing, proving, and interesting own conclusions about an object, state or process something. From some of the opinions of experts that have been described, then the authors can conclude that the practicum method in a way in which students conduct experiments by experiencing to prove himself a question or hypothesis learned so that they can cultivate and develop scientific attitude in students, also provides an overview and clearer understanding than mere verbal explanation so it is very useful for the purposes of everyday life. From the opinions described above it can be concluded that the practicum learning model is one activities in the use of IPA technology in society so that students can bring up and express ideas about something topics in general can apply scientific concepts that developed through practice or observation.

Strengths and Weaknesses of Practicum Method

The practicum method has advantages, namely as follows:

- a. Can make students more believe in the truth or conclusions based on self-experiments rather than just receiving explanations from the teacher or from books.
- b. Can develop an attitude to conduct studies exploration of science and technology.
- c. Can foster scientific attitudes such as cooperation be honest, open, critical, and tolerant.
- d. Students learn by experiencing or observing something themselves process or event.
- e. Enrich students' experience with things that are objective and realistic.
- f. Develop a critical and scientific attitude.
- g. Learning outcomes will last a long time and there is a process internalization (Suparno, P., 2007)

In addition to having advantages, practical methods also have weaknesses, which include the following:

- a. Requires various equipment facilities and materials that are not always easy to get and cheap.
- b. Every practicum does not always give the same result expected because there are certain factors that are different beyond ability.
- c. In everyday life not all things can be used experimental material.
- d. Very demanding mastery of material development, facilities the latest equipment and materials (Suparno, P., 2007)

Practicum Method Steps

Djajadisastra (1982) argues that on implementation practicum so that the expected results can be achieved properly it is necessary to take the following steps:

1. Preparatory Steps

Good preparation needs to be done to zoom out weaknesses that may arise. such preparation among others, setting practicum objectives, preparing tools and materials needed, prepare a practicum place, consider the number of students with the number of availability tools and practicum place capacity, preparing factor security of practicum, preparing rules and regulations discipline, and make instructions and steps practice.

2. Implementation Step

Before doing the practicum, students discuss the preparations with the teacher after that then ask for the need for practice. During the process of carrying out the practical method, teachers need to make observations of the practicum process both as a whole and as a group.

3. Follow-up

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After carrying out the practical method, the next activity is to ask students to make a practical report, discuss the problems that occur during the practicum, and check the cleanliness of the tool and store everything back equipment that has been used

The following are the stages and examples of applying the method practicum in their lives as students namely as following:

a. Orientation

Orientation is the teacher's effort to focus attention students, for example by mentioning or showing something that often occurs in everyday life relating to the topic being studied, effort to be studied with environmental phenomena.

b. Idea Generation

Formulation of ideas is an effort to bring out student's initial concept. For example by asking to write what is already known about the topic of conversation, or answering a few open-ended questions The teacher at this stage is an effort to explore knowledge early students. So, it can also be done through interviews informal.

c. Reorganization of Ideas

Disclosure and exchange of ideas precede opening of a conflict situation. This stage is an attempt to explain or express students' initial ideas about a topic in general, For example in a way discuss students' answers in the second step (idea generation) in small groups, then wrong One group member reports the results of the discussion into the whole class. The teacher doesn't blame or justify. At the opening stage of student conflict situations given the opportunity to seek scientific understanding that being studied in the textbook. Then students search some differences between their early conceptions of the text and scientific concepts contained in textbooks or the results of observations of the activities carried out.

d. Application of Ideas

At this stage students are asked to answer questions that prepared to apply scientific concepts that have been developed by students through experimentation or observation into a new situation. This reconstructed idea in its application can be used to analyze issues and solve problems in the environment, All people know the word sour from the fruit we taste for example sour taste in apples, oranges, besides that we are also familiar Solutions that are often used are vinegar and sulfuric acid. Acid is also associated with disease and pollution environment, for example stomach acid and acid rain.

e. Consolidation of Ideas

Conceptions that have been obtained by students need to be given feedback by the teacher to strengthen the scientific concept. With this students whose initial conception is inconsistent with Scientific concept, will consciously change the initial concept to a scientific concept. On occasion compare initial concept becomes a scientific concept, on occasion compare scientific concepts that have been compiled with initial concept at a later stage.

B. Learning Outcomes

Definition of Learning Outcomes provide an understanding of the learning outcomes it will first described in terms of language. This definition consists of two words 'outcome' and 'learning'. In the Big Dictionary of Languages Indonesia (KBBI) results have several meanings: 1) Something that held by business, 2) income; acquisition; fruit. Whereas learning is a change in behavior or response caused by experience. The definition of learning outcomes is the abilities that students have after receiving their learning experiences, whereas according to Gagne learning outcomes must be based on observing behavior through stimulus response (Sudjana, 2005). Learning outcomes with regard to students' abilities in understanding the subject matter. According to Hamalik (2007) argued, "the learning outcomes of patterns of behavior, values, notions, attitudes, appreciation, abilities and Skills". Learning outcomes appear as a change in behavior in students that can be observed and measured in the form changes in knowledge, attitudes and skills. Change This can be interpreted as an increase and development which is better than before, for example from not knowing to knowing, being impolite to being polite and so on (Hamalik, 2007). Assessment of the process and results of learning and learning is the implementation of Government Regulation (PP) Number 19 of 2005 concerning National Education Standards (SNP). SNP determination has implications for the model and 12 techniques educational learning assessment. Assessment planning the process and results of learning and learning includes assessment external and internal.

Step planning process assessment and learning outcomes and learning includes an assessment plan of the learning process and plans for assessing student learning outcomes. Plan assessment of the process and results of learning and learning is assessment plan that will be carried out by the teacher to monitor the process of progress of the development of student learning outcomes in accordance with their potential and expected abilities continuously.

Based on Bloom's Taxonomy, learning outcomes are in order learning includes three categories of domains, namely:

1. The cognitive domain, with regard to intellectual learning outcomes consists of six aspects, namely:
 - a. Knowledge
 - b. Understanding
 - c. Application
 - d. Analysis
 - e. Synthesis
 - f. Evaluation

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2. Affective domain, with regard to attitudes and values. affective realm includes five levels of ability, namely:
 - a. Receive
 - b. Answer/Reaction
 - c. Assessing the Organization
 - d. Characteristics with a value
 - e. Value Complex
3. Psychomotor domain, including:
 - a. Motor skills
 - b. Manipulation of objects
 - c. Neuromuscular coordination (connecting, stalking)

The type of cognitive learning outcomes is more dominant than affective and psychomotor because it is more prominent but psychomotor learning outcomes and affective should be part of the assessment results and processes at school. Based on the understanding above then it can be concluded that learning outcomes are the abilities possessed by students after they receive them learning experience and the results can be used by teacher to be used as a measure or criterion in achieving an educational goal and this can be achieved if students have understand learning by itself by changing behavior even better.

Factors Affecting Learning Outcomes

Factors that influence learning outcomes include factors that found within the student, and factors that exist outside the student. Internal factors come from within the child is biological, while external factors are factors that are from outside oneself student.

a. Internal factors

Internal factors include physiological factors, namely physical condition and state of physiological functions. Very physiological factor support or background learning activities. Circumstances a healthy body will have a different effect than a healthy body unhealthy condition. To maintain physical condition stay healthy, nutrition should be sufficient. This is due to a shortage food levels will result in a weak physical condition causing drowsiness and tiredness. Psychological factors, that is that encourage or motivate learning, these factors including:

1. There is a desire to know
2. In order to get sympathy from others
3. To correct the failure
4. To get a sense of security

b. External Factors

External factors, namely factors from outside the child who participates affect children's learning, which, among other things, comes from people parents, school, and society.

1. Factors that come from parents

Factors originating from these parents are mainly divided how to teach parents to their children In this case can associated with a theory, whether parents educate democratic, pseudo democratic, authoritarian, or laissez faire way. The way or type of educating that each one has has its advantages and disadvantages too. According to frugal researchers, the type of educating in accordance with leadership Pancasila is better than the types above. Because parents in interfering in children's learning, will not enter too deep. The very principle of Pancasila leadership humanely, because parents will act in a sung way tulada, ing madya mangun karsa, and tut wuri handayani.,In Pancasila leadership this means parents do positive habits to children to be imitated. Parents also always pay attention children during learning either directly or indirectly, and give directions when to do actions that are less orderly in learning.

2. Factors that come from school

Factors that come from school, can come from teachers, eyes lessons learned, and methods applied. Factor Many teachers are the cause of children's learning failures, viz concerning the personality of the teacher, his teaching ability. Against subjects, as most children focus on what is of interest only, so result in the value obtained is not in accordance with which are expected. Skills, abilities, and will Children's learning cannot be separated from influence or interference other people's hands Therefore it is the teacher's duty to guide children in learning.

3. Factors originating from the community

Children cannot be separated from community life. Facto society even very strong influence on child education. The influence of society is even difficult controlled. Support or not support In the development of children, society also influences.

III. RESEARCH METHODOLOGY

A. Research Design

The research design used was two groups pretest and posttest design. The research design can be seen in the table following:

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Table 1. Research Design

Class	Pre-test	Treatment	Post-test
Eksperiment	Pr1	X1	Po1
Controll	Pr2	X2	Po2

The population in this study were all students of class XI IPA Private high school in Jakarta with a total of 56 students meanwhile the sample is class XI students consisting of 56 people of 28 students as experimental class and 28 students as control class taken by purposive sampling technique.

The instrument in this study was a test in the form of objective questions which consists of 30 questions with options A, B, C, D, E. Before the test instrument is used, the instrument is tested by expert.

B. Data Analysis

The purpose of data analysis is to examine or answer the truth of the hypothesis put forward. To test the hypothesis research, the following steps are used:

1. Normality test

The normality test is used to determine the origin of the research of a normally distributed population or not. Normality test using the Shapiro-Wilk technique through SPSS 24 for windows because the number of research samples ≤ 56 students. Spread said normal or cannot be seen in the SPSS test output table of normality by looking at the level of significance, the data will be said normal if the significance value is ≥ 0.05 How to find out significant or not significant test results normality is to pay attention to the numbers in the column significant (sig). to determine the normality of the data, the significant level test using $\alpha = 0.05$. If the significance obtained is > 0.05 . then the sample comes from a normally distributed population. Willbut if it is significant < 0.05 then the sample does not come from the population which is normally distributed. (Dahlan I Amos, 2013).

2. Homogeneity Test

Homogeneity test was carried out to find out whether an sample comes from a homogeneous population or not. In variance homogeneity test research was carried out using Levene type SPSS version 24 program by looking at the output table SPSS test of homogeneity of variance. Homogeneity test results said to be homogeneous if the significance value is greater than 0.05 (Amos, 2013)

3. The t test

The t test was carried out to find out whether the independent variable, namely the practicum learning method, has a significant effect on the dependent variable, namely student learning outcomes. The t test applied is the right side t test.

4. Gain Test

Gain score calculation aims to find out how to increase student learning outcomes. Classification index gain as follows:

Table 2. Classification Index Gain

Gain Score	Interpretation
0.71 - 1.00	High
0.31 - 0.70	Middle
0.1 - 0.30	Low

IV. RESULTS AND DISCUSSION

A. Data Description

Based on the application of practical methods in the experimental class and do not give special treatment to the control class then obtained student learning outcomes in the research sample that became research data to be analyzed are presented in the table following:

Table 3. Data Description

Data Description	Experiment Class		Controll Class	
	Pre-test	Post-test	Pre-test	Post-test
N	28	28	28	28
Mean	60.5	72.7	60.1	65.0
Median	60.0	75.0	58.3	65.0
Mode	43.3	46.7	53.3	60.0

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Standard Deviation	14.7	17.00	11.9	12.5
Variance	214.6	288.1	142.0	155.1
Range	56.7	53.3	50.0	46.7
Minimum	36.7	46.7	36.7	43.3
Maximum	93.3	100.0	86.7	90.0
Sum	1693.3	2036.7	1683.3	1820.0

Normality Test Results

Before testing the research hypothesis based on statistics parametric research data must be normally distributed. **Test results normality can be seen in the following table:**

Table 4. Normality Test Results

Score	Shapiro-Wilk		
	Statistic	df	Sig
Experiment Pre-test	0.957	28	0.294
Control Pre-test	0.982	28	0.900

The results of the normality test in table 4 above show that significance value (Sig.) through the Shapiro-Wilk approach pretest value the experimental class and the pretest control class respectively 0.294 and 0.900. Based on the normality test criteria, all values The significant value is greater than 0.05. It can be concluded that the data used in this study are normally distributed

Homogeneity Test Results

Test results for homogeneity test can be seen in the following table:

Table 5. Homogeneity Test Results

Class	Levene Statistic	df1	Sig
Experiment	0.980	28	0.49
Controll	1.447	28	0.26

Referring to table 5 it is known that the significance value for experimental class based on Levene's approach of 0.487. The significance value is greater than 0.05 ($0.487 > 0.05$) so that it can be concluded that the research data obtained from class the experiment is homogeneous. Furthermore, the significance value for control class based on the Levene approach of 0.263 Mark the significance is greater than 0.05 ($0.263 > 0.05$), so it can be it was concluded that the research data obtained from the control class homogeneous.

Hypothesis Test Results

Hypothesis test result can be seen in the following table:

Table 6. Hypothesis Test Results

Score	Class	Paired Differences					
		Mean	Std. Deviation	Std. Error	t	df	sig
Posttest- pretest	Experiment	12.264	6.288	1.188	10.321	27	0.000
	Controll	4.405	4.449	0.841	5.238	27	0.000

The results of the paired t test in table 6 above show that the value significance (Sig.) in the experimental class of 0.000 is less than 0.05 ($0.000 < 0.05$). This means that there is a real difference between the pretest scores and the posttest scores in the experimental class. Even farther it can be stated that the practicum method used in experimental class has a significant effect on chemistry learning outcomes student. It is also known that the significance value (Sig.) is in the control class of 0.000 less than 0.05 ($0.000 < 0.05$). It means there is real difference between the pretest scores and the posttest scores in the class control. Furthermore it can be stated that the learning method The conventional method used in the control class also has an effect significant effect on students' chemistry

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learning outcomes. It is also known that the t value for the experimental class is 10.321 and the t value for the control class is 5.238. It is clear that value t in the experimental class is greater than the value of t in the control class. Based on the theory, the greater the value of t the more significant or the better the effect of a treatment. So it can be stated that the effect of practicum methods on students' chemistry learning outcomes better than the effect of conventional methods on results learn chemistry students.

Gain Test Results

By using spss, the calculation results for the gain value are obtained as in the following table:

Table 7. Gain Test Results

Class	Avarage of Pre test score	Avarage of PostGain test score		Percentage
Experiment	60.48	72.74	0.31	31%
Controll	60.15	65.00	0.12	12%

Based on table 7 it is known that the gain value for class control of 0.12. If percentage based on the gain value, it can be seen that there was an increase of 12%. While the gain value for the experimental class is 0.31. If it is percentaged based on the gain value, it can be seen that there was an increase of 31% or in the middle category

B. Discussion

The main purpose of this research is to find out improving student learning outcomes using practical methods. To achieve this goal the researcher conducted an analysis of learning outcomes that have been obtained from research activities and data retrieval. This research was conducted in class XI with colloidal material, so that the study population is all class XI which amounted to two classes of 56 students. Researcher then take one experimental class and one control class. For determine the sample technique, previously used the homogeneity test population. Based on an analysis of the initial conditions population, namely through the analysis of student pretest data obtained results that the population has the same homogeneity. for pickup sample based on purposive sampling technique, namely takers sample based on considerations that focus on objectives certain. Based on the purposive sampling technique, the researchers determined class, namely the experimental class that gets learning using the practicum method and the control class get learning without practical methods. The results of the analysis based on descriptive statistics show that the average pretest score of students in the experimental class is better than, on the average pretest scores of students in the control class. Simply it can be stated that the initial understanding of students who are in class experiment is better than the understanding of students in the control class. It is also known that the average posttest score of students in the experimental class also higher than the posttest average scores of students in the control class. When viewed from the magnitude of the difference between the average value of the pretest and posttest, the application of the practicum method is better than the application conventional method. This means an increase in students' chemistry learning outcomes that happened in the experimental class that applied the method practicum is greater than the increase in student chemistry learning outcomes in the control class that applies conventional methods.

Next, the results of parametric statistical analysis through paired t test shows that practical methods and conventional methods which were applied to the experimental and control classes respectively both have a significant effect on students' chemistry learning outcomes. When viewed further from the magnitude of the t value, the experimental class is applying practical methods has a greater effect than the control class that applies conventional methods. This matter occurs because the t value for the experimental class is greater than the t value in the control class. As is well known in theory, the greater the value of t , the greater the effect by a treatment. The results of the t test are also supported by the results of the gain test shows that the gain value in the experimental class is greater than the gain value in the control class. It means the application of the method practicum is better than the application of conventional methods in improve students' chemistry learning outcome

CONCLUSIONS

Based on the analysis and discussion can be drawn conclusion as follows:

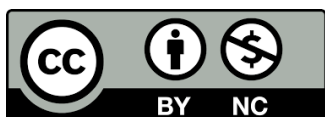
1. There is an increase in chemistry learning outcomes for class XI students in high school by using the method practicum as evidenced by the acquisition of t count data of $10,321 > t$ table.
2. Based on the overall average score, the yield increases studying chemistry class XI student by using the practical method of 31% with the interpretation of the medium category

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