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## Table of Content

Improving Writing Proficiency through The 3M (Meniru-Mengolah-Mengembangkan) Writing Strategy for Grade VI SD Negeri 8 Kilensari Panarukan Sub-District of Situbondo District in 2014/2015 Academic Year Sukasih Sukasih

Effect of Web-Based Linear Program Teaching Material Use on Student's Learning Result in Linear Program Material. (Study on SMK 6 Kota Malang) Elina Nur Fatimah

Effects of Project-Based Learning Strategy on Student Metacognitive Skill to Learning Biology Mawarti Endah Pratiwi

Employing Critical Reading Strategy to Promote Students' High Order Thinking Skills Ratri Handayani

The Need of Bringing Discovery Learning Models Based Traditional Games in Mathematics of Teaching Materials Sam Isnardiantini, Budi Usodo, Soegiyanto Soegiyanto

Effect of Social Economics to Reading Interest Learning Programs of Equal Education Programs Irfan Ardiansyah, Bayu Pradikto

The Effectiveness of The Process-Based Skills Approach of Lesson Study Toward Achievement In Biology of Vocational School Students Faizah Firdaus, Suratno Suratno, Kamalia Fikri

Local Wisdom As The Basic Of Analysis In The Planning Of The Management Of The Relationship Between School And Society Asri Widiatsih, Nurul Ulfatin, Imron Arifin, Achmad Supriyanto

Improving Students' Ability in Writing using Peer Correction Faricha Rizqi

Femininities and Masculinities Depiction: A Critical Discourse Analysis Farieda Ilhami Zulaikha

The Use of Talking Chips Technique to Improve Students' Speaking Skill Intan Mahardika Kusumastuti

Stem Based Learning Development Design in 2013 Curriculum Integrated by Quran Gun Gun Ginanjar, Maulana Suhadi

The Training Management Model to increase the capacity of Human Resources on the Santri Ready To (SSG) Daarut Tauhid Bandung Indah Nurasiah

The Effectiveness of Product sampling Communication by Primagama Surabaya Nuris Alfian Fikri

Development of Integrated Learning Model of Soft Skills and Hard Skill in Raising the Competence of Citizens Learning Institute Courses on Beauty Wiwin Herwina

Maximizing The Use of Internet-based Resources in Improving Listening Skill Astiti Dwi Handayani

Hand Gesture Optimization Using Structure From Motion Muhammad Sonnie Bestian, Risanuri Hidayat, I Wayan Mustika

On the Development of Web-GUI Interface for Analyzing Polytomous Responses Tika Clarinta Putri Utama, Indriasih Yanuwijaya, I Made Tirta

Application of TPS (Think Pair Share) Type of Cooperative Learning Model to Improve Activities and Learning Outcomes of X IPA1 Students in the Material of Inverse Function at SMA Negeri 3 Jember Academic Year of 2016/2017 Teripena E. C





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## The Effectiveness of The Process-Based Skills Approach of Lesson Study Toward Achievement In Biology of Vocational School Students

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### ABSTRACT

*Theory and practice are the one-entity that must be mastered in studying biology. Facts show that biological knowledge is not accompanied by practice of such science so that it focuses on theory. For that, it takes a learning approach that develops the skills to process knowledge acquisition that is the process skill approach. In addition to implementation of the strategies used, success in teaching and learning can not be separated from the teacher's efforts. Lesson Study is one that can be used as a method for teachers to exchange ideas in the preparation and development of biology learning plan. The purpose of this research is to know the effectiveness of process approach based on Lesson Study on Biology student learning outcomes. This research type is quasi experimental by applying approach of process skill base on Lesson Study in experiment class and conventional learning model, that is lecturing and question and answer in control class. Results of the analysis using the effectiveness test using gain score. Average gain score of the experimental class is greater than the average gain score control class which means that learning using the approach of Lesson Study based process skills is more effective than conventional learning. Result of the affective value analysis using independent t-test shows ( $sig = 0,000 < 0,05$ ) so that based on the same variance assumption, the two classes have significant affective value difference or in other words there is influence of different treatment to student affective value..*

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## INTRODUCTION

Biology is one of the branches of science that studies about living things and the environment. Learning biology is not just getting knowledge about living things, but also gaining knowledge about the method of practicing the science [17]. However, it is unfortunate that the importance of biological knowledge is not accompanied by learning activities that are oriented to the skills of learner's process in school [2].

Biology learning basically should be able to equip students how to know concepts, facts in depth, and should be able to provide intellectual satisfaction, especially in building the ability of thinking [12].

It is relevant to the purpose of education, especially Vocational High School (SMK) is applying science as the basis of the mastery of productive competence and self-development because basically the nature and characteristics of science learning, especially science learning as part of the science formed and developed through a scientific process that must also be developed in learners as meaningful experiences that can be used as a stock of future development [3].

Efforts to overcome these problems should be on teaching biology teachers more involving the role of students in learning. The process skill approach is the development of learning system that streamlines students by developing skills in the process of acquiring knowledge so that learners will discover, develop their own facts and concepts and foster attitudes and values demanded in specific learning objectives. [4] Thus, the process skills approach leads to the development of basic skills to discover facts and concepts as well as developing attitudes and values through teaching and learning process so as to grow a certain amount of skills in the learners themselves.

Application of process skill approach in biology learning can be integrated in student practicum activities, but special instructional strategy is needed to make the students process skill growing. [8] Selection of instructional strategies is important in improving the quality of the learning process. Learning would work best when the selection of appropriate learning strategies [15]

Aside from the implementation of the strategy used, the success in teaching and learning process can not be separated from the teacher's own efforts in studying a lesson. Form of learning assessment that provides a process for collaborating and evaluating the success of teaching strategies is known as Lesson Study [8].

Lesson study is one that can be used as a method for teachers to exchange ideas in the preparation and development of biology learning plan. Lesson study provides a process for teachers to collaborate and design lessons and evaluate the success of teaching strategies that have been implemented in an effort to improve student learning and learning processes [8].

Based on the background, it is necessary a study entitled "The Effectiveness of Lesson Study Based Skills Approach to Students Learning Outcomes of Vocational High School SMK"

## METHODS

The type of research used is quasi experimental. This research was conducted at SMKN 5 Jember class X majoring in Poultry Agribusiness (ATU) of gasoline semester on fungi subject done in semester gasal. Determination of the sample in this study using



method like normality and homogeneity test with leavene statistic technique using SPSS application Statistics 18.0. from the homogeneity test results obtained homogeneous results so that in this study using random sampling method is by drawing technique to determine the control class and experimental class.

After the experimental class and control class are determined, the lesson study phase is followed. Stage Planning of the model teacher along with the observer design the lesson using the process skill approach, the second stage of implementation or the implications of the planning stage and pre-test the experimental and control classes before the lesson and the refleksi phase to evaluate the learning as well as model teachers. Student's cognitive score was measured using ANAKOVA and students' affective values were measured by SPSS using independent sample T test

## RESULTS AND DISCUSSION

Determination of the sample of this study begins with the normality test values of students of class X SMKN 5 Jember. This is done to know the distribution of the student's value is normally distributed or not. Based on the result of normality test on the UAS biology value distribution, it is known that the significance of class X ATU 1 is 0,386; X ATU 2 of 0.512; X ATU 3 of 0.205. All three classes have a significance level greater than 0.05 so that the UAS biology value of students is normally distributed.

Second, to test homogeneity to know the level of uniformity of class X in SMKN 5 Jember, so that can be used as basis for determination of control class and experiment class. Leavene test results show a significance level of 0.468 or greater than 0.05 so that the three classes have biological values with the same variant (homogeneous).

Third, analyze the ANAKOVA to test the effect of learning by using approach skill of process based on Lesson Study to student cognitive learning result. Based on the results of the ANAKOVA test on the students' cognitive learning outcomes (pre-test and post-test) it is known that the corrected model has a significance of 0,000 (sig = 0,000 <0.05), meaning there is a significant effect on learning using a process-based skills approach Lesson Study on students' cognitive learning outcomes.

Fourth, to test the t-test to test the difference of students' affective value. Based on t-test results obtained significance value of 0,000 (sig. = 0.00 <0.05). So based on the same variance assumption, the two classes have a significant affective value difference or in other words there is influence of different treatment to affective students.

Fifth, calculate the level of effectiveness of learning by using approach skills based on Lesson Study on the students' biology learning outcomes by using the gain score formula. In the experimental class the average gain score of 0.56 and the control class on average gain score of 0.36 so that the average gain score of the experimental class is greater than the average gain score of the control class which means learning using the process skills approach based Lesson Study is more effective than conventional learning.

The cognitive learning outcomes assessed in this study were the pre-test and post-test scores consisting of 10 multiple choice questions and 5 description questions. From the data, it is found that the average increase that occurred in the experimental class with treatment using the Lesson Study based process skill approach is greater than the mean improvement in the control class.

In the ANAKOVA test results, it is also known that there is a significant effect of class differences on students' cognitive learning outcomes (pre-test and post-test) of

0.001 (sig = 0.001 <0.05) means that there is a significant influence on the experimental class.

Based on the average value between the experimental class and control class and also the results of the analysis can be concluded that the lesson using the skills approach based on Lesson Study process tested on the students of class X ATU 2 SMKN 5 Jember proved to give a better influence in improving students' cognitive learning outcomes. The application of the scientific process skill approach in Biology learning can improve the cognitive learning outcome and student character [16]. Cognitive development largely depends on how far the child will actively interact with his environment [10]. The presentation of knowledge that encourages students to find their own knowledge is done through the process of learning using a process based skills approach Lesson Study.

Based on the calculation of the effectiveness of learning using the gain formula, the average gain obtained by the experimental class is 0.56 and the control class is 0.36 which are both categorized as medium gain. However, from the results it can be seen that the gain value in the experimental class is greater than the control class gain value which means that learning using the Lesson Study based process skill approach is more effective than conventional learning.

Learning with the approach of science process skill gives stimulation to the students in the form of understanding the facts and concepts of science better. In addition, students are given the opportunity to interact with science, feel the processes and products of science actively [6]. Learning with science process skill approach can improve science learning outcomes that consist of cognitive aspects of process, motor sensory, and affective [7]. In this case the Lesson Study introduced at SMKN 5 Jember provides fresh air and new ideas for teachers to make learning changes that can be applied in class X ATU 2 so that there is an increase in student learning outcomes [13].

Assessment of students' affective learning outcomes is assessed based on the observation sheet during the learning process. The assessed indicators are discipline, questioning, courageous and independent. Assessment of affective learning outcomes is done every time the meeting because the affective learning can not be known if only in one meeting and attitude changes can be seen gradually.

The first indicator is the attitude of discipline, the average value of the experimental class of  $3.83 \pm 0.380$  is greater than the average value of the control class of  $2.73 \pm 0.688$ . It is seen that the experimental class students can follow the learning activities well. Although during the learning process the classroom atmosphere is still crowded, but the students keep doing their work well [16].

The second indicator is daring to ask, the average value of the experimental class of  $2.54 \pm 0.658$  is greater than the control class average value of  $2.00 \pm 0.738$ . Asking is a verbal utterance in the form of a sentence aimed at obtaining information about the unknown [7]. To acquire the questioning skills it is necessary to understand the essence of good questions through questioning exercises both in written and oral form [8]. This is closely related to the step of process skills that presents the problem. With teachers presenting issues early in learning, it will stimulate students to think about problems and ask questions related to the material to be taught.

The third indicator is bold opinion, on this indicator the average value of the experimental class of  $3.45 \pm 0.588$  is greater than the average value of the control class of  $2.47 \pm 0.845$ . This is seen in the results of student observations during the learning

process takes place on the courage of students in expressing opinions during classroom learning. In the control class Students tend to be passive and less interested to express opinions about the lessons conveyed by the teacher either in the form of asking or answering questions. Process of learning that there should be a two-way interaction into a one-way interaction only because many students who seem less interested or passive in receiving lessons from teachers. Teaching methods used by teachers to be very important because the ability and courage of students in expressing class opinions need to be stimulated by teachers so that students are motivated to dare to argue in accordance with the lessons encountered [9].

The fourth indicator is the independent aspect. Independent learning activities mean independent of others, have the ability, and responsible themselves in solving learning problems. In this indicator the average value of the experimental class of  $3.58 \pm 0.653$  is greater than the average value of the control class of  $2.82 \pm 0.777$ . This can be seen in the results of student observations during the learning process takes place. Students in the control class ask more and imitate the work of friends in doing their work, few students do the task independently without mimicking the work of friends.

Lessons learned based on process skills based on Lesson Study can improve students' affective learning outcomes. In the classroom applying Lesson Study at the time of learning will minimize the students to do things outside the learning process activities. It will also minimize the behavior of students who are not good in the class because in each group in the experimental class there are observers who observe students in each group. Although the experimental class at the first meeting affective student learning outcomes are still low, at the second meeting seen an increase. In the control class at the second meeting also showed an increase but still greater the value of the experimental class.

## CONCLUSION

Lessons learned based on process skills based on Lesson Study are effective in improving students' biology learning outcomes. Data is supported by a gain-score test in the average gain-score experimental class of 0.56 and the control class on average gain score of 0.36 so that the average gain score of the experimental class is greater than the average gain score of the class control which means learning using approach of process skill based on Lesson Study is more effective than conventional learning. On the affective aspect, it is supported by different test result (t test) between experiment class and control class with significance 0.000 (sig = 0,000 <0,05) indicating that there is influence of learning difference between experiment class and control class to students science process skill where the experimental class has a higher mean than the control class.

Based on the results of observation and research that has been done then suggestions that can be submitted are as follows.

- a. Preferably in learning using a process based skills approach Lesson Study, teachers should consider the allocation of time spent. So that no time is wasted and in accordance with specified time allocation.
- b. Better learning using a process approach based on Lesson Study skills is re-done by biology subject teachers, because it proved effective in improving student learning outcomes as well as teachers and observers to benefit from such learning.

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