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# The Application Of Inquiry Based On Lesson Study

Farida Nur Kumala<sup>1</sup>

Universitas Kanjuruhan Malang  
[faridankumala@unikama.ac.id](mailto:faridankumala@unikama.ac.id)

**Abstract.** The objective of this study was to describe the application of inquiry learning on Science subject of primary school based on lesson study. This research used descriptive qualitative method by college students of PGSD2013 B as the subject research and four lecturers as the observer. The instrument of this study was observation sheet and questionnaire. Data analysis technic of this study used data analysis of Miles and Huberman namely collecting the data, reducing the data, presenting the data and concluding. Result of the study indicated the application of lesson study consists of *plan*, *do* and *see*. In *do* step was doing guided inquiry learning that consists of some steps: problem oriented, creating the hypothesis, collecting the data, testing the hypothesis, and concluding. It could be concluded that the students' quality learning can increase when teacher/lecturer attention more on students' condition in the classroom.

## INTRODUCTION

The development of thinking ability is important to be enhanced towards students. The development of thinking ability can be done through learning activities that based on quality questions (Jansen, 2011). Learning based on question for example inquiry learning model. Inquiry is conceived as active process for observing, asking question, planning an investigation, review what is already known by evidence or experimenting, collecting the data, analyzing the data, answering question and communicating the result (discuss) (Arslan, 2013; Pedaste, 2015). Inquiry model is assumed can enhance thinking ability, students' activities (Chang et. al, 2015), students' interest and deepen material (Suduc et. al, 2013) in learning. Inquiry learning model have been applied by some researchers before such as Alameddin & Ahwal, 2016; find Expressed as inquiry learning that has been applied can improve student achievement. Most students are happy with this activity (Suduc, et.al, 2015).

In research that conducted showed that not all students got cognitive, affective and psychomotor learning result and those were not prevalent yet on the class that have been applied inquiry treatment. Those things can be caused by several factors; one of them was teacher or lecturer. Currently, teacher or lecturer have not noticed and understand in details the characteristics of each student. A teacher is more likely to see students as having same needs and acceptance in learning. Therefore, only some students understand and the others do not understand yet by teacher's explanation. This problem is not only from a student that lazy in studying, but it also can be caused by the way of the students to study and their characteristics is not proper by the way of the teacher teach. Being a teacher must be able to correct by the need of the students, therefore, can help students in learning.

Because of those things, they need more attention from teacher to know the problem, the way study and students' characteristic when learning process happen, through these knowledge, a teacher is easy to understand and give an act towards each student. Meanwhile, a problem that found in learning is a teacher's limit to observe learning process that happens in details. One of the ways to solve this problem is applying lesson study in learning. Lesson study is one of the learning systems that a teacher is able to collaborate by another teacher to correct a learning process by forming a learning, doing a learning, and evaluating together to correct the quality of learning (Susilo, 2011). Lesson study contributes to teacher professionalism and enhancement of the broader educational system

(Lewis, 2002). In a lesson study a teacher looks at ways of learning, thinking and student learning outcomes in detail, teachers get extensive information (Ngang & Sam, 2015).

Lesson study has some main steps that conveyed by Susilo. She was adopted from Lewis (2002) that stated if lesson study step consists of: plan, do and see. *Plan* is processing a plan step of learning before the implementation of learning is ongoing. *Do* is learning implementing that using learning plan on *plan* step. On this step, a teacher is helped by observer for observing the learning process and college students activities when learning process is happen. *See* is a step to execute learning reflection that is happen. Reflection is done by a teacher model and observer, besides the data of students' reaction when learning process ongoing. Based on these, the objectives of this study is trying to apply inquiry learning based on lesson study.

## METHOD

This study was using descriptive qualitative approach to observe a learning process in Primary school science subject by using inquiry learning model based on lesson study. Subject of this research was one of the lecturers model, four lecturers as observer and twenty college students of PGSD 2013B. In this research lesson study learning consists of *plan*, *do* and *see*.

- a. *Plan*: this step is done a plan together with lecturer that has responsible in this subject to plan lesson design, chapter design, lesson plan, media and teaching material that will be used.
- b. *Do*: in *do* step is done a learning activities which is proper by a plan that resulted on *plan* step, namely by implementing learning by using inquiry learning model. Inquiry's steps consist of: 1) problem oriented, 2) creating the hypothesis, 3) collecting the information or observation, 4) testing the hypothesis, and 5) concluding. Instrument that used on this step is observation sheet and questionnaire. Observation sheet is used by observer for observing the learning process and college students activities in the classroom. Questionnaire is used to know college students' responds when learning process is happen.
- c. *See*: it is a discussion step between model lecturer and observer. It happens a giving suggestion, college students' activities report, and some weaknesses that faced by college students and model lecturer when the learning process is happen.

The data of result study was analyzed by using Miles and Huberman data analysis that consist of:

- a. Collecting the data: the data was collected from some instruments that have been used when the study was happen, (the data from questionnaire and observation sheet).
- b. Reduction of the data (data selection): the data was selected and analyzed based on need. The data that would be required in this study was the data that belonging to some implementation steps of inquiry model based on lesson study.
- c. Presenting the data: the data that had been reduced was presented.
- d. Concluding: the data that had been presented was analyzed for concluding.

## RESULT AND DISCUSSION

Learning based on lesson study consisted of some steps that integrating inquiry learning model in learning primary school science subject was: *plan*, *do* and *see*. In *plan* step was done a plan and creating a lesson design, chapter design and lesson study. Lesson design was map of concept from the material that would be learned become more details concepts. Map of concept that made was material map of concept which assumed as difficult thing to be taught towards students. In this study, there was developed map of concepts about force and energy material. This material was assumed as difficult material, inasmuch the concept force and energy is abstract. Describing the concept would make a learning become more details and to be formed a scenario of learning easily. Trianto (2011) map of concept will provide a logical basis for deciding on key ideas to be included and removed from the teaching plan.

In this step was also done the made of chapter design. Chapter design was a plan of learning on a meeting. The development chapter design was developed based on a problem that happens in previous learning process. When the making of chapter design was ongoing, it was divided into three part of learning namely the beginning, middle and end. Before making chapter design should be written first the reach of learning and subject identity. After it was written, continued by the making of chapter design on an end part. On an end part was written evaluation that would be given to the college students, the evaluation was included by college students' presumption of the answer and the expression of them when got an evaluation. The make of chapter design was continued by writing on the middle part (content). It was written planning of activities by the lecturer and the college students' responds towards these activities. The learning content of activities was agreed with evaluation that developed before. Next, it was developed on the beginning part. On the beginning part was written apperception and students' responds towards these apperception.

The development of chapter design was continued by developing a lesson plan, choice the media and teaching material. The media that had been chosen in this study was concrete media and virtual simulation to ease the understanding of college students towards the abstract force. Besides, in *plan* step was also prepared learning observation sheet on *do* step. The plan stage provides several benefits such as (Nesusin et al, 2014): (1). Continuous improvement of learning, 2). Emphasizing the development of learning according to the problems in the classroom, 3), emphasizing co-learning learning, 4). Able to develop teacher pedagogy skills. ..

The second step in lesson study was *do* step. *Do* step was a step conducting a learning process that helped by observer when learning process was happen. In this step the model lecturer conducted the learning process agree with inquiry steps, meanwhile the observer only observing the move of model lecturer and college students when learning process was happen. *Do* step was conducted by observers' help would ease lecturer model observe in detail the ongoing learning process.

In *do* step was developed an inquiry learning process that consist of: 1) problem oriented, in this step college students were given questions that related to force, the question had been prepared by model lecturer which written on students' worksheet. Problem oriented was supported by giving virtual simulation media. Problem oriented aimed to develop college students thinking ability which they was asked to memorize experience that had been gotten before. Problem orientation will allow the emergence of various solutions that arise from students' thinking (Trianto, 2011).

The second inquiry process was continued by creating the hypothesis. Creating the hypothesis was done by college students by making temporary answer towards the problem that had been given by lecturer model. College students arranged the hypothesis individually. The hypothesis arrangement can be useful for developing analysis ability of the students by predicting the relation of related variable. A hypothesis can be accepted or declined.

The third of inquiry step is collecting the information or observation. Collecting the information was aimed to take the data in answering question on problem oriented. Collecting the information was done by college students doing a practicum about force changing, factors that influence the force, literature study to answer and prove the truth of hypothesis. The collection of the information was done together in a group. Working together will provide motivation and develop dialogue skills to improve social (Slavin, 2005) and thinking skills (Trianto, 2011).

It was continued by testing the hypothesis. Testing the hypothesis was done by analyzing observation result study of literature was agreed with hypothesis that submitted before. In this step, the college students would know the hypothesis that they were created right or wrong. It made students looking for the answer and knowing the exact of decision that had been made actively. 5) The next step was concluding. College students were taking the conclusion based on observation testing the hypothesis. Concluding can be taken from general data then minimalized on one analysis about the factor that could make magnitude force and the change of energy in a phenomenon. Inquiry learning is a learning that can develop social manner, analyzing ability, and activities in learning process. Learning is run in constructivist atmosphere, where the students looking for a concept in a learning actively. Gulo (2002) in Trianto (2011) states that inquiry is a series of learning that develops students' ability to think critically, logically, analytically and systematically. Inquiry learning takes place in a constructivist atmosphere (Serafin, 2015), where students are actively seeking concepts in a lesson. According to Piaget, learning

constructivism considers that knowledge is self-built through the active involvement of students in learning. Active involvement of students will make learning more meaningful.

The third step in lesson study was *see*. *See* step is reflection process between lecturer model with the observers. Reflection is considered a teacher's skill to examine carefully and continuously what, how to teach students to be better (Chetcuti, 2007 in Galini and Kostas, 2014).

The result of *see* step was lecturer felt experiencing an obstacle in conditioning classroom when the college students doing practicum (collecting the data), meanwhile the reflection result from observers indicated if the learning process by using inquiry conducted well. Lecturer model was able to explain the material towards the students clearly. Therefore, in outline the college students were enthusiast, active and motivated to find the answer. However, there were some obstacles that not conducive enough when the lecturer did practicum activities, there were some students that not noticed yet by the lecturer especially the students who sit at the backside. Students' perception result were also showed the same thing with the observers if the lecturer was less take notice the students at the backside but students also described the advantages of the model lecturer namely the students were enjoy with the use of the learning media virtual simulation that can be appeared the learning material.

The result of reflection activities was used for correcting on the next learning. Reflection activities were aimed to observe the weaknesses and advantages when learning process was happen. The weaknesses result could be corrected, besides for the advantages could be noticed and developed more. On reflection activities the model lecturer and observers exchanged opinion to evaluate learning activities. These would be better if compered by evaluating individually.

Lesson study is a collaborative for sharing knowledge and experiences with each other (Kanaunan & Inprashita, 2014) in developing qualified teachers (Inprasitha, 2014). Lesson study includes gradual and continuous learning development, emphasizing class change, innovative approach that leads students to practice the thinking process openly (Nesusin Et.al, 2014).

## CONCLUSION

Learning primary school science subject based on lesson study consisted of plan, do and see steps. In do step was applied inquiry learning model that aimed for developing thinking ability and students' activities. The implementation of inquiry learning based on lesson study indicated there were an improvement in interest and attention of the students when the learning process happen. When each student was noticed more in detail, then problem of study would be decrease and increase result study of the students.

## ACKNOWLEDGEMENT

We are grateful towards University of Kanjuruhan Malang especially primary school education department that have given facilities and support in conducting this study.

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