Implementation Of Learning Instrument By Using Guided Inquiry Model To Improve Student's Learning Achievement On The Heat Material

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Abstract- This research aims to: (1) describing implementation of learning instrument by using guided inquiry model to improve student's learning achievement on the heat material. The research population are 25 students of class XI IPA-3 at SMA Dr. Soetomo Surabaya academic year 2018/2019. The implementation of the lesson plan is the level of achievement of the stages in the lesson plan made by the teacher during the learning process. Data collection techniques from this research were observation. The learning performance was assessed using an observation sheet filled by two observers. The implementation of the lesson plan is assessed by two observers and is measured using an instrument in the form of an observation sheet of the implementation of the lesson plan. The data obtained is a picture of the suitability of the stages of learning based on the lesson plans made. The quality of performance is calculated using the number of learning stages multiplied by 100 percent. The quality of performance can be seen from the average score of two observers of at least 3.0 (very good category). Based on the results of research and discussion, it can be made the conclusion that learning using guided inquiry model can improve student's learning achievement on the heat material.

Index Terms- Implementation of Learning Instrument, Guided Inquiry Model, Student's Learning Achievement, Heat Material

I. INTRODUCTION

Physics is a branch of Natural Sciences. Physics is the heart of the development of information and communication technology that has fundamentally changed human life. Based on global and historical views, physics has provided more dynamic methods to help humans analyze and solve complex life problems. Many students studying physics were not interested and had no understanding after studying physics [1]. In terms of student's opinions, educators are required to be able to present meaningful physics learning and the younger generation is interested in learning it. Physics is one of the basic sciences that plays an important role in building science and technology. Physics is a field of science that deals with how to find out about nature systematically. So physics is not only the mastery of a collection of knowledge in the form of facts, concepts, or principles but also is a process of discovery. Physics education places more emphasis on providing hands-on experience to develop competencies so students can explore and understand the natural environment scientifically [2]. The 2013 curriculum aims at learning physics in Basic Competencies and Core Competencies whose learning is directed at the achievement of competencies summarized in Competency Standards Graduate.

The guided inquiry learning model consists of six stages, namely: (a) planning, (b) obtaining information, (c) processing information, (d) creating information, (e) communicating information, and (f) evaluating [3]. The advantages of the guided inquiry learning model, namely: (a) as scaffolding or student learning aids in learning; (b) as a general language for teachers and students; and (c) as a guide for monitoring student abilities. The education process is a very important thing in the whole mobilization of education activities. How the education process is carried out will determine the quality of the achievement of educational goals. The main goal of managing the educational process is the occurrence of learning processes and optimal learning experiences. Because the development of student behavior as a learning goal is only made possible by the optimal learning experience [4].

Competency formation is a core activity of implementing the learning process, namely how competencies are formed in students, and how learning objectives are realized. The process of forming competencies is said to be effective if all participants are actively involved both mentally, physically and socially. This confirms that competence is affective and psychomotor is not enough just to be taught with lectures. However, appreciation needs to be accompanied by experiences of cognitive values, affective manifested in behaviors (behavioral skills) everyday [5].

Based on the explanation above, the researchers chose the guided inquiry model to improve the learning achievement in the high school on the heat material. According to researchers, the material is appropriate if taught using guided inquiry models on the grounds that in the material students are required to conduct experiments and observations. In some parts of the material can cause student's curiosity about an event related to heat material in everyday life.

II. EXPERIMENTAL METHOD

2.1 General Background of Research

The main purpose of this research to describing implementation of learning instrument by using guided inquiry model to improve student's learning achievement on the heat material. This research was conducted in students at SMA Dr. Soetomo Surabaya academic year 2018/2019.

2.2 Sample of Research

The sample in this research was 25 students of class XI IPA-3 at SMA Dr. Soetomo Surabaya academic year 2018/2019.

2.3 Instrument and Procedures

The implementation of the lesson plan is the level of achievement of the stages in the lesson plan made by the teacher during the learning process. The implementation of the lesson plan is assessed by two observers and is measured using an instrument in the form of an observation sheet of the implementation of the lesson plan. The data obtained is a picture of the suitability of the stages of learning based on the lesson plans made. The quality of performance is calculated using the number of learning stages multiplied by 100 percent. The quality of performance can be seen from the average score of two observers of at least 3.0 (very good category). The learning performance was assessed using an observation sheet filled by two observers.

2.4 Data Analysis

The observation sheet on the implementation of the lesson plan uses the guided inquiry model by the observer to observe the implementation of the steps in the lesson plan and determines the criteria for the management of learning that the teacher has done. The implementation of the RPP observed included preliminary activities, core activities, and closing activities. The observation sheet on the implementation of the lesson plan contains phases that must be done by the teacher in the process of learning the score that the observer must give based on the assessment instructions summarized in the instrument of the implementation of the lesson plan.

The implementation of the lesson plan is an assessment of the quality of the implementation of the lesson plan in each phase and the percentage of the implementation of the phases of guided inquiry learning carried out. The assessment of the quality of the implementation of lesson plans in each phase is determined by comparing the average rating scale given by one observer. The percentage of the implementation of guided inquiry learning phases is determined by comparing the number of aspects that are carried out with the total number of all aspects of the learning design done by the teacher during the learning process multiplied by 100%. Observations were made using an assessment sheet of the RPP implementation and said to be carried out if the score obtained was R > 75% [6].

Analysis of the implementation of learning carried out by one observer who has been trained to understand the observation sheet correctly, then the data is processed in a descriptive qualitative. Data analysis techniques can be calculated using the following equation. In observing, the observer gives a sign (√) in the performance column (yes or no) and the assessment column (4: excellent, 3: very good, 2: good, and 1: not good) [7]. The assessment criteria obtained are by comparing the average rating scale given by the observer with the following evaluation criteria:

$$R = \left(1 - \frac{A - B}{A + B}\right) x100\%$$

Information:
R: instrument reliability (percentage of agreement)
A: higher score from validator
B: lower score from validator

Table 1. Criteria for the Level of Implementation Lesson Plan

Score	Criteria
1,00 – 1,49	Not Good
1,50 – 2,49	Good
2,50 – 3,49	Very Good
3,50 – 4,00	Excellent

III. RESULT AND DISCUSSION

Every time face-to-face in the learning process using the guided inquiry model, observations made by two observers who have been trained so that they can operate the observation sheets correctly. This assessment includes an introduction, core activities, closing. Based on the assessment criteria of the two observers for each aspect of the eyes, the categories will be determined.

Aspects observed in the preliminary activities: (1) conveying objectives and motivating students get an average of 3.8 and get excellent category. (2) Giving a problem orientation get an average of 4.0 with excellent category. (3) Conveying learning objectives/indicators get an average of 3.7 with excellent categories. (4) Organizing students to learn (forming groups, preparing tools and materials needed) get an average of 3.5 with excellent category. So the average preliminary activity is 3.8 get an average of 4.0 with excellent category.

The core activities observed aspects get results: (1) Showing the problems to be found get excellent categories with an average of 3.5. (2) Guiding students to answer questions before carrying out finding activities get excellent category with an average of 3.8. (3) Guiding students to formulate hypotheses by the formulation of existing problems get very good category with an average of 3.3. (4) Guiding students to conduct experiments get excellent categorization with an average of 3.8. (5) Guiding students to do worksheet activities get excellent categorized with an average of 3.7. (6) Guiding students to analyze very good categorized data with an average of 3.3. (7) Guiding students to answer the questions get excellent categorical with an average of 3.7. (8) Guiding students to make conclusions get good category with an average of 3.7. (9) Guiding students to present the findings get good categories with an average of 3.7 (10) Guiding students to give responses to other groups get good categories with an average of 4.0. So that the results obtained in the core activities are excelent categorized with an average of 3.7.

For the closing aspects include (1) Guiding students to analyze and evaluate the understanding of concepts to get an average of 3.7 with good categories. (2) Formative tests get an average of 3.7 with good category. (3) Remind students to learn the next material to get an average of 3.8 with good category. The result of the average closing aspect is 3.7 with good category.

IV. CONCLUSION

The results of observations about the implementation of the lesson plan using the guided inquiry model in each syntax obtained an average value 3.7 with good category. Means that implementation of learning instrument by using guided inquiry model can improve student's learning achievement on the heat material.

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