

## The Importance of Guided Inquiry on Human Respiratory System Material to Improve Scientific Attitude of Students

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**Abstract:** The purpose of this study was to obtain preliminary study data on the scientific attitude of students through the guided inquiry learning model on the topic of the human respiratory system. Data were collected by using needs analysis on 153 junior high school students spread across five regencies in Lampung Province. This study used descriptive qualitative method and the data were collected by using questionnaire. The results of the study indicated that not all stages of guided inquiry were implemented to natural science learning with the guided inquiry learning model properly. The results of a survey on students at five regencies in Lampung Province showed that natural science learning with the guided inquiry learning model was not all in accordance with the stage carried out such as making problem formulations and making temporary hypotheses. The scientific attitude showed honest and disciplined indicators, the truth of the data or opinions obtained from the results of the experiment and respond to the statements of friends who did not understand. The implementation of guided inquiry learning is believed to not only increase the abilities of students to understand the material but it can also improve scientific attitude which is a 21st-century skill that students must have to be able to prepare for more complex lives to compete globally. It is believed that the use of the guided inquiry learning model in the learning process is very necessary because it can have a positive influence on the scientific attitude of students on some thing abstract.

**Keywords:** Learning model, Guided inquiry, Scientific attitude

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### I. Introduction

In the 21st century, fierce competition occurred in various field of life including education, especially science education. Human resources have begun to be replaced with technology so that the skills possessed by humans can no longer follow the standards of the past<sup>1</sup>. This change needs to be anticipated by dominating the 21st century<sup>2</sup>. Critical thinking skills need to be improved through learning. Natural science is a collection of knowledge that is arranged systematically and developed, which not only through a collection of facts but also marked by the emergence of scientific methods that are realized through scientific work, values, and scientific attitude<sup>3</sup>. In the natural science learning process, there are several aspects namely, high curiosity, honest attitude, critical attitude, flexible and conscientious attitude.

These aspects are included in the attitude component that is a scientific attitude<sup>2</sup>. Scientific attitude in natural science learning is based on the claim that the behavior of scientists is essentially motivated by scientific attitude or some one who has a desire or even often follows scientific procedures said to be motivated by scientific attitude<sup>6</sup>. Scientific attitude needs to be improved in natural science learning to improve the quality of Indonesian education<sup>2</sup>. To overcome the above problems, innovation is needed to be applied by teachers as educators in the form of learning models.

The learning process in schools must be supported by the ability of teachers and learning models so that students do not feel bored in the learning process<sup>4</sup>. In the learning process with the guided inquiry model, the teacher does not just let go of the activities carried out by students. This guided inquiry model trains students to be more oriented towards guidance and instruction from the teacher so students can understand the concept of the lesson. In this model, students will be faced with relevant tasks to be completed either through group discussions or individually to be able to solve problems and draw conclusions independently. The guided inquiry model can be used as an alternative learning model so students can solve problems accompanied by the teacher<sup>6</sup>.

Learning models based on findings and experiments can have a positive impact on the scientific attitude of students. Implementation of the guided inquiry learning model has a positive effect on problem-solving ability<sup>7</sup>. The purpose of this study was to obtain preliminary study data on the scientific attitude of students through the guided inquiry learning model on the topic of the human respiratory system. The scientific

attitudes used are honest, disciplined, thorough, responsible and diligent. Based on the above explanation, a study is needed to determine the need for the guided inquiry learning model in the learning process of junior high school students. The purpose of this study was to obtain preliminary data regarding the importance of applying the guided inquiry learning model, specifically the human respiratory system material to improve the scientific attitude of students. The study results can be used as an alternative in choosing an appropriate learning model in the application of natural science learning at the junior high school level

## II. Method

This study used descriptive qualitative method. The data was obtained by using a needs analysis with a sample of 153 junior high school students in five regencies in Lampung Province, such as Bandar Lampung City, South Lampung, Metro City, Tanggamus, and Central Lampung. This study was focused on analyzing the needs of the importance of the scientific attitude of students through the guided inquiry learning model on the topic of the human respiratory system in junior high schools in Lampung Province. Criteria for analyzing the need for a scientific attitude questionnaire through the guided inquiry learning model on the topic of the human respiratory system can be seen in Table 1.

**Table 1.** Criteria for analyzing the need for a scientific attitude questionnaire through the guided inquiry learning model on the topic of the human respiratory system

Percentage	Criteria
0,00 – 20,00	Very Low
20,10 – 40,00	Low
40,10 – 60,00	Fair
60,10 – 80,00	High
80,10 – 100,00	Very High

## III. Results

The data were obtained in the form of data of needs analysis on the improvement in the scientific attitude of students through the guided inquiry learning model on the topic of the human respiratory system. The sample of this study was 153 junior high school students spread across five regencies in Lampung Province. Data collection used questionnaire distribution. These results can be seen in Table 2.

**Table 2.** Results of needs analysis on the importance of the guided inquiry learning model on the human respiratory system material to improve the scientific attitude of students.

No.	Statement	Percentage (%)	Criteria
1.	Learning is oriented to the problems that occur in everyday life	70.0	High
2.	Teacher provides an opportunity to express the formulation of the problem simply	21.1	Low
3.	Teacher provides the opportunity to make hypotheses on the formulation of problems	27.3	Low
4.	Teacher provides an opportunity to prove the hypotheses proposed	26.1	Low
5.	Teacher provides opportunities for students to formulate conclusions from a given problem	55.6	Fair
6.	Teacher provides opportunities for students to describe observational data	62.4	High
7.	Teacher provides opportunities for students to show the truth of the data or opinion based on the results of the experiment	40.2	Fair
	Teacher trains scientific attitude in learning process	32.9	Low
	a) each teacher trains honesty	8.23	
	b) each teacher trains thoroughness	6.12	
8.	c) each teacher trains disciplinary	6.18	
	d) each teacher trains responsibility	4.35	
	e) each teacher trains diligence	8.02	
9.	Teacher gives examples related to the scientific attitude of students in the natural science learning process	63.8	High

10.	Teacher needs to make improvements in the learning process in order to improve the scientific attitude of students	97.7	Very high
Average		49,71	Fair

Table 2 is divided into 2 parts, namely the guided inquiry learning model analysis on learning of the human respiratory system in schools were in statement number 1 to 7. While the need for the improvement in scientific attitude in the learning process of the human respiratory system were in statement number 8 to 10. The percentage of the guided inquiry learning model in learning can be seen in Figure 1. While the percentage of the need for the guided inquiry learning model in the learning process to improve scientific attitude which can be seen in Figure 2.

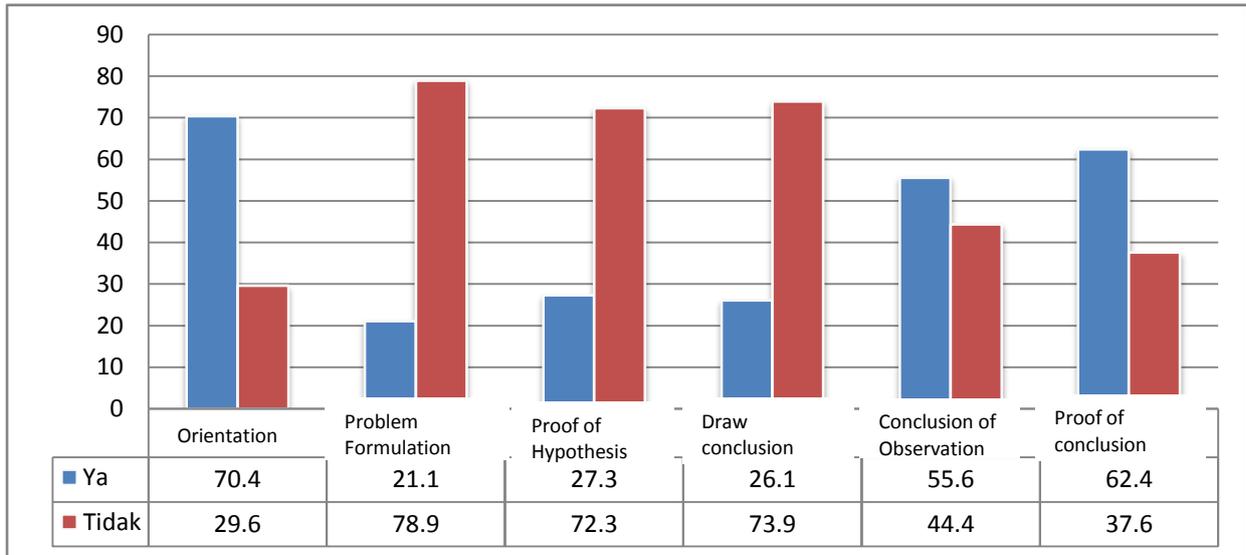


Figure 1. Percentage of the guided inquiry learning model of the Human Respiratory System Material

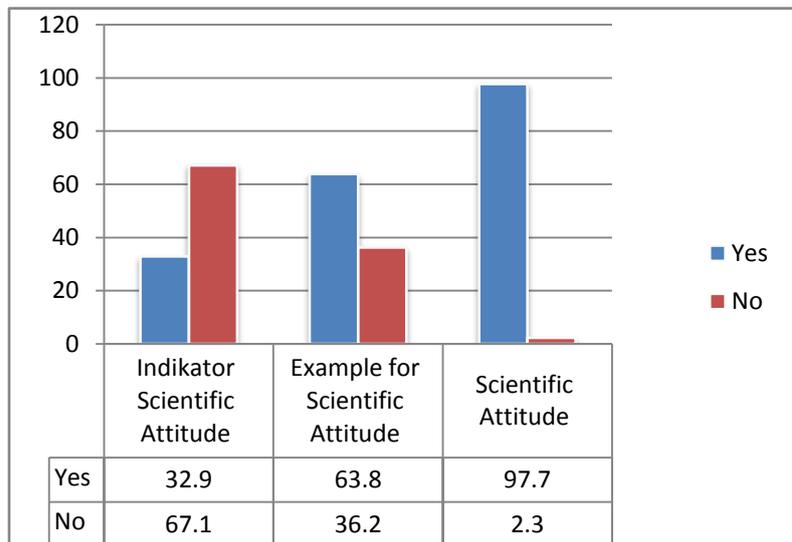


Figure 2. The percentage of the need for the guided inquiry learning model of human respiratory system material

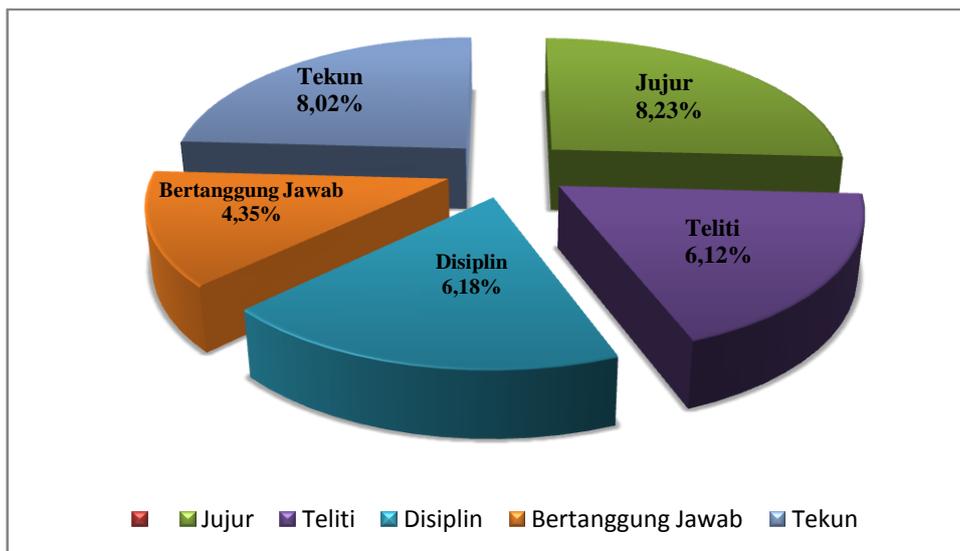


Figure 3. Percentage of scientific attitude of students

#### IV. Discussion

Based on Table 2 above, students learn through examples in every day life. In the statement "students are given the opportunity to formulate problems" had a low percentage, it showed that the teacher had not actively involved students in the learning process by using the guided inquiry learning model<sup>9</sup>. The learning process with the inquiry model is learning that is able to develop the abilities of students both in terms of cognitive, affective and psychomotor aspects, because in this learning, the ability to think and the skills and attitudes of students are developed through problems and observations at the learning stages with the inquiry. It can be said that students need a learning model that can make students more active in learning, namely the guided inquiry learning model<sup>10</sup>. There are many learning models that can be used in the learning process.

One learning model that is designed to overcome these problems is the guided inquiry learning model. The guided inquiry model is a learning process in which the choice of the problem is still determined by the educator. Human respiratory system material contains the process of human respiration, accompanied by concepts so students will learn the inhale and exhale processes. This requires the guided inquiry learning model that involves the ability of students to search and investigate systematically, critically, logically, and analytically, so that students can formulate them selves with the help of guidance from the teacher through guide questions<sup>11</sup>. The learning model involves students directly such as showing, using or demonstrating what students are learning that can make learning effective and can be stored longer in mind<sup>12</sup>. The guided inquiry learning model is able to improve students' process skills. Guided inquiry learning procedures are carried out by involving students in inquiry, helping students identify concepts or methods, and encouraging students to find ways to solve the problems they face.

Based on the results of the study, in Table 2 there were steps in the guided inquiry that had not yet been fulfilled. On the topic of the human respiratory system, students are given an orientation to the problem but to formulate the problem, make a hypothesis, and prove the hypothesis had not been performed much. Attitudes are generally defined as traits that are constantly shown in a range of possible expressions, for example, a range of very dislike to very like or supportive properties of an object or phenomenon. In the scientific attitude, students had not been able to show the truth of the data or opinions obtained from the results of the experimental so they had not responded to statements that friends did not understand<sup>13</sup>. So in this case the scientific attitude is related to one's feelings towards a particular object accompanied by a tendency to act in accordance with that object.

The natural science learning process with guided inquiry learning models can provide opportunities for students to actively participate in the learning process<sup>14</sup>. Students learn by finding concepts that are learned independently, based on problems that exist in everyday life. The results obtained train the scientific attitude of students. The indicators contained in the scientific attitude, namely: honest, discipline, thoroughness, responsible, and cooperation. These five indicators can be trained in the learning process<sup>15</sup>. Based on the results of the questionnaire, there was a fair percentage of results on the improvement of the scientific attitude of students. Students will gain more meaningful experiences and be more strongly attached to their minds<sup>16</sup>. The more information attached to student memory, the higher the influence on student learning outcomes<sup>17</sup>. In the learning process, students can learn to solve problems using scientific attitude skills<sup>18</sup>.

## V. Conclusion and Suggestion

Based on the results and discussion, it can be concluded that the average scientific attitude with the guided inquiry learning model was in low category (49.71%). It can be concluded that the guided inquiry learning model was implemented in schools during the learning process even though not all of the existing syntax was not implemented properly, especially in the following variables, namely the formulation of problems, make hypotheses and prove hypotheses. Teachers felt the impact of the guided inquiry learning model that can improve the scientific attitude of students. The stages of guided inquiry need to be trained on students, in order to implement the 2013 curriculum which prioritizes skills according to the demands of the 21st century.

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