Implementation of Guided Inquiry Learning Model to Science Process Skills in Junior High School

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Abstract

This study aimed to determine how students' science process skills are by applying a guided inquiry learning model to the material of the interaction of living beings to the environment at one of the junior high schools at Langsa city, Indonesia. The type of research used is experimental research with the form of pre-experimental design, and the research design is one shot case study. The results showed the highest percentage value of science process skills in the observation/observing indicator, namely obtaining a score of 78.95% with the "good" category. The average score on the science process skills indicator of the overall indicator is 66.73%, with the category "sufficient." Based on the results obtained, the value of science process skills with the implementation of a guided inquiry learning model on the interaction material of living beings to the class VII environment at one of the junior high schools at Langsa obtained an average score of 63.17% with the category of "sufficient.".

Keywords: Science process skills, Guided inquiry learning, Junior high schools, Interaction of living things material

INTRODUCTION

The science of education has always developed from time to time. According to Lestari (2018), the development of education science supports the creation of new technologies that shape the progress of the times. So far, the technology developed has entered the digital stage. Even in Indonesia, all sectors, including education, have begun to use technology to make work easier.

Students are led to have the ability in the learning process. One of the expected skills is science process skills. According to Wiratman et al. (2021), science process skills are a process of learning that prioritizes what will be received. Skills in receiving knowledge can use psychic abilities (mental) or physical abilities (actions).

In education, there must be an interaction between teachers and students when carrying out teaching and learning activities. One learning model that involves students' activeness to build their own knowledge is the guided inquiry learning model. According to Juhji (2016), learning with guided inquiry is a model developed to involve students actively. Students learn a lot by conducting a series of investigative activities to discover scientific concepts and principles and develop creativity when solving a problem and, in its implementation, still need guidance. The inquiry learning model is a learning process that begins with formulating problems, developing hypotheses, collecting evidence, testing hypotheses, drawing temporary conclusions, and testing these temporary conclusions to come to conclusions that are believed...
to be true (Nurdiansyah and Fahyuni, 2016). The main emphasis in the guided inquiry-based learning process, according to Kurniati et al. (2018), lies in the ability of students to understand, then identify carefully and carefully, then end by providing answers or solutions to the problems presented. So it is expected that students will not only tell science but doing science.

Based on the results of preliminary observations in the field, one of the junior high schools at Langsa city, Indonesia already has adequate facilities. However, some teachers still lack the guidance for students in conducting experiments and laboratory activities. Many teachers still use conventional methods (lectures), and student learning resources only use books. During learning, teachers rarely involve students actively, so students only expect the teacher's explanation and read the book themselves during the learning process. Teachers also still do a lot of assessments that only focus on cognitive assessment, while assessments on emotional and psychomotor aspects are carried out less optimally. So this results in students needing help understanding natural science lessons and impacts the Science Process Skills obtained by the student.

**METHOD**

This study used experimental research with a Pre-Experimental Design and a type of one-shot case study (Jakni, 2016). We conducted this research on May 18-June 11, 2022, at one of the junior high schools at Langsa city on Jln. Asam Peutik, Simpang Wie, East Langsa District, Langsa City, Aceh. The population used in this study was all class VII, and the sample used was class VII-2 which consisted of 20 students. This study uses sampling techniques, namely random sampling techniques and data collection in the form of observation sheets in the form of rubrics assessing the appropriateness of the scientific process, which three observers will fill in during the learning process and documentation.

The data analysis used is the validity test of the observation sheet, the analysis of the results of the observation sheet, the normality test, and the hypothesis test.

The validity test carried out on the observation sheet instrument is the validity of the contents in the rubric of the assessment of students' science process skills. The validation test result data are analyzed using the formula: The formula for calculating the percentage result of instrument validation uses the following equation (Wardani et al., 2021).

\[ P = \frac{f}{N} \times 100\% \]

**Description:**
- \( P \) = Number percentage of questionnaire data
- \( f \) = Number of scores obtained
- \( N \) = Number of Maximum Scores
The data results based on the observation sheets that have been obtained are then analyzed with the formula:

$$ NP = \frac{R}{SM} \times 100\% $$

Description:
NP : Percentage value sought or expected
R : Raw score obtained by students
SM : Ideal maximum score of the corresponding test
100 : Fixed number, bold, centered, can reach maximum

### Table 1. Categorization of Science Process Skills scores

<table>
<thead>
<tr>
<th>Percentage (%)</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 85</td>
<td>Very good</td>
</tr>
<tr>
<td>70-85</td>
<td>Good</td>
</tr>
<tr>
<td>55-70</td>
<td>Sufficient</td>
</tr>
<tr>
<td>41-55</td>
<td>Less</td>
</tr>
<tr>
<td>≤ 40</td>
<td>Very less</td>
</tr>
</tbody>
</table>

(Juhji, 2016)

Before the hypothesis test is carried out, the normality test is first carried out using the lilliefors method. This normality test is used to identify data from the research results to see whether the distributed data is normal. The hypothesis test is carried out with a one-sample t-test with the formula (Sugiyono, 2017):

$$ t = \frac{\bar{x} - \mu_0}{s} \times \sqrt{n} $$

Description:
\( \bar{x} \) = mean
\( \mu_0 \) = hypothesized value
S = standard deviation
n = number of samples

### RESULTS AND DISCUSSION

The results were obtained based on the rubric of assessment of science process skills that have been assessed with three observers. It can be seen in Figure 1.
Figure 1. Science process skills based on indicators of science process skills

The rubric for assessing students' science process skills consists of 8 (eight) indicators evaluated by three observers during the learning process using a guided inquiry learning model. The highest percentage score in the observation indicator was to obtain a score of 78.95% in the "good" category. This happened because students could observe the biotic and abiotic environment found in the school environment and were able to observe interactions between living things. In this case, the students can discover biotic components such as oxen, monkeys, chickens, birds, crickets, etc. The students found sunlight, water, air, soil, and so on in the abiotic component. The average score of the indicator of science process skills as a whole is 66.73% with the category of "sufficient."

There are three students who occupy the good category and 17 students who occupy the sufficient category. The categorization of science process skills in Table 2.

<table>
<thead>
<tr>
<th>Science process skills in a classical manner</th>
<th>Number of students</th>
<th>The Value of Science Process Skills</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>formulate hypotheses</td>
<td>20</td>
<td>63.17%</td>
<td>sufficient</td>
</tr>
</tbody>
</table>

It can be seen the results of the observations that observers have made on students at the time of applying the guided inquiry learning model, namely the average score of students' overall science process skills of 63.17% with the category of "sufficient." The normality test used in this study aims to determine whether the data obtained in the study is normally distributed. Because of Lcount < Ltable (For Lcount = 0.1721 and Ltable 0.1900). So, the data obtained are normally distributed.
To test the hypothesis, first, formulate the statistical hypothesis. Here is the statistical hypothesis in this observation: 

\[ H_0 = \text{Student science process skills value} \geq 70\%; \quad H_a = \text{student science process skills value} < 70\% \]

For \( t_{\text{count}} = -5.735 \) and for \( t_{\text{table}} = 1.729 \). Because of the calculation of the \( t_{\text{table}} < \), it can be concluded that the hypothesis test carried out with the one-sample \( t \)-test, namely \( H_0 \), is rejected, and \( H_a \) is accepted.

The learning process with a guided inquiry learning model can improve students' science process abilities. According to Sulistiyono (2020: 69) because the guided inquiry learning model allows broader thinking about problems, facilitates the collection of observational data, facilitates problem discovery, and trains students' creativity to say ideas indefinitely, but still limits the number of subjects studied.

The first indicator is to formulate a hypothesis, and the sub-indicator used is to give an opinion about predicting the probability that will occur from the results of observations. In this aspect, students are required to predict the possibilities that will occur from the results of practicum or observations. In this aspect, the percentage obtained from the science process skills assessment rubric is 64.57% and is included in the "sufficient" category. This happened because some students were still confused in predicting the possibility that would occur from the results of observations (Lusidawaty et al., 2020).

The second indicator is the indicator of planning research. Sub-indicators are designed to identify what is observed, measured, or described. In this aspect, the percentage value obtained from the Science Process skills assessment rubric is 64.78% which is included in the "sufficient" category. This happens because, in observing the components of the surrounding environment and the interactions between living beings, some students need to determine what activities will be observed, measured, or written on observations in the surrounding environment (Rahayu et al., 2021).

The third indicator is observation; the sub-indicator used in this indicator is to use as many sensory tools as possible when making observations. According to Mahmudah (2016), this observation can be interpreted as the process of collecting sensory data on phenomena and events. Students should look for and observe biotic and abiotic components in the environment. In this aspect, the percentage obtained from the rubric for assessing science process skills is 78.95% and is included in the "Good" category. This happens because most students can observe biotic and abiotic components and are able to observe the interactions that occur between living things. Students can find biotic components such as oxen, monkeys, butterflies, crickets, etc. The students found sunlight, water, air, soil, and so on in the abiotic
component. Interactions between living beings students can distinguish between symbiosis of mutualism, parasitism, and commensalism.

The fourth indicator is classifying/grouping. The sub-indicators used are recording the observation results in the observation table that has been provided. In this indicator, the percentage obtained from the science process skills assessment rubric is 65.20% and is included in the "sufficient" category. This is because students, during the observation stage or observing, can observe the components of the surrounding environment and interactions between living things well. However, only some students record the results of observations in the table that is already available on the student activity sheet (LKPD) that has been given before the observation indicators are carried out.

The fifth indicator is interpretation/conclusion, while the sub-indicator used is to conclude the observation results. At this indicator, students are required to infer the results from observations on the components of the surrounding environment and interactions between living beings. In this indicator, the percentage obtained by students from the science process skills assessment rubric is 69.37% and is included in the "sufficient" category. It occurs because only most students can infer the results of observations that have been made on the observation of the components of the surrounding environment and interactions between living beings. Students concluded that there are several biotic and abiotic components in the surrounding environment. Such as rice, butterflies, chickens, oxen, monkeys, sunlight, water, soil, etc. On observation of interactions between living things, students concluded that there is an interaction of mutualism, parasitism, and commensalism. According to the research of Kiay (2018), this indicator for concluding is complicated for students because the game factor influences it. The teacher supervises each group during the observation process, but many students do not complete the tasks assigned by the teacher.

The sixth indicator is communicating, as for the sub-indicators used in this indicator, systematically compiling, submitting reports, explaining observations, and discussing observation results. In this aspect, students are required to submit reports systematically, explain the results of observations and discuss the results of observations of components in the surrounding environment and interactions between living things. According to Mahmudah (2016), communication consists of oral communication and writing about the results of other process skills. The description can result from discussions, summaries, graphs, tables, photos, posters, etc. In this aspect, the percentage obtained by students from the science process skills assessment rubric is 62.27% and is included in the "sufficient" category. This happens because, at the time of compiling and submitting the report of the observation results, most of
the students submitted the report not seriously and played around a lot. Supported by Kiay (2018) opinion, teachers motivate each group through observation and practice. Still, it is said that students rarely make communication indicators because students do not dare to perform.

The seventh indicator applies the concept, while the sub-indicator used in this indicator uses concepts in new experiences to explain what happened. In this aspect, the percentage produced by the rubric of assessing students' science process skills is 66.25% and is included in the "sufficient" category. This happens because some students cannot apply new experiential concepts to explain what happens in the school environment and when studying interactions between living beings.

The eighth indicator is asking questions; the sub-indicator used is asking about things related to observations and the material interaction of living things to the environment. In this indicator, the percentage obtained from the rubric of assessing students' science process skills is 62.47% and is included in the "Enough" category. This happens because when observation and communication are carried out, most students do not ask questions about observations or the material interaction of living beings with the environment.

CONCLUSION

Based on the results and discussions obtained, there is an effect of the implementation of guided inquiry learning models on the interaction material of living beings to the environment of class VII-2 Junior high school on science process skills. The average score with categorization included in the "sufficient" category with an average score of 63.17% for science process skills.

SUGGESTIONS

The suggestions that can be given for further research include; understanding the steps of the guided inquiry learning model so that learning becomes more effective. The researcher can determine the appropriate indicators of science process skills for better results according to the material used.

REFERENCES


