Implementation of Probing Prompting to Improving Student Learning Outcomes on Ecosystem Material in Senior High School

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Abstract

Probing Prompting is a teaching model that presents the demanding nature of knowledge and explores students' knowledge so that students can think actively with the new knowledge they are learning. This research aimed to see the improvement in student learning outcomes and how much improvement is by applying the probing prompting learning model to the Ecosystem material in class X science at one of the senior high schools in Langsa. This study is a quasi-experimental method with a quantitative population approach used in this study of all class X science, namely as many as four classes. The Sample in this study is class X science two as the experimental class and X science three as the control class, with a total of 46 students. The instrument used is a multiple-choice written question total of 20 questions. Data analysis is used by hypothesis testing using the N-gain score formula. The results showed an increase in student learning outcomes by applying probing prompting to ecosystem material in class X at one of the senior high schools in Langsa with an N-gain score of 65.09%, with the category being interpreted quite effectively.

Keywords: Probing Prompting, Learning Outcomes, Ecosystem Material, Senior High School

INTRODUCTION

Education is learning that can help humans understand and have knowledge so that it can encourage students to be critical and active in thinking. Education is an activity deliberately based on student input that can result according to the goals made (Purwanto et al., 2016). In the national system in Indonesia (2003), written in Law No. 20 of 2003, article 1, paragraph 1, written education is a conscious and planned effort to create a good learning process and learning situation. Learning can improve students' abilities to have religious spirituality, personality, noble character, intelligence, and competence needed by students, society, nation, and state.

In today's development, education is beneficial because, without an education in a country, especially the Indonesian state, it can be separated from other countries. Therefore, the function of education is to educate a nation, and education also allows for a higher quality of human resources. If students can achieve the expected competence, the learning process can be successful because the student's ability to understand the material is a complementary option. For this reason, using the right and effective learning model cannot be separated from it. One thing that can affect the low cognitive outcomes of students is the learning process that still uses conventional and expository learning models. This expository method is a method in which students explore practice exercises
and record some gaps from the package book so that it affects student learning outcomes. In the education process, teachers play an active role where the teacher is a component in the education system and are the most important and closer party to students in implementing education. Students are called a driver in education also the teacher plays a significant role in determining student success (Hoesny & Darmayanti, 2021). However, current learning is still teacher-centered, so students are less active, which results in students being less enthusiastic in participating in learning and causing low learning outcomes.

Learning outcomes could be improved in learning currently. Like one of the senior high schools in Langsa, student learning outcomes are still relatively low because students do not participate in learning. An interview with one of the biology teachers one of the senior high schools in Langsa showed that students' learning depends on the teacher. Also, most teachers still apply conventional learning so that students are less active or participating in learning, causing student learning outcomes to be still classified as low.

From the problem above, a learning model is needed to motivate students to be active in learning. As stated by Afriawan (2012), creating a learning atmosphere that attracts students' attention by applying an effective learning model to be applied to the classroom is an effort to improve student learning outcomes. In this case, a teacher must be able to use a learning model where the learning model can increase student motivation to learn so that the learning process can run according to indicators. According to Haidir and Salim (2014), educators are essential to carry out the learning process properly and correctly because the task of an educator is not only to deliver material but, most importantly how to make students want to learn. This task is what should be based on educators in learning. In this learning, what and however the learning process carried out by educators, it should boil down to the creation of a learning atmosphere such as the application of learning models that can create a learning atmosphere that can attract students' attention. One of them is through the probing prompting learning model.

Probing Prompting is a learning model that prepares demanding knowledge and explores student knowledge so that they can continue the student thinking process with the knowledge they have just learned (Shomin, A., 2014). The advantage of this probing prompting model is that probing prompting can encourage students to think actively and can, give students time to express their opinions from the knowledge or
ideas they learn, and can make students dare to ask students (Novena & Kriswandani, 2018; Susanti, 2017). From the explanation of the problem above, the author wants to carry out a study entitled application of the Probing Prompting learning model to improve student learning outcomes in ecosystem material in class X science one of the senior high schools in Langsa. The study aims to find out if there is an increase. Student learning outcomes by applying the Probing Prompting learning model to ecosystem material in class X science one of the senior high schools in Langsa, and how much improvement it has.

**METHOD**

The research was conducted for one month at one of the senior high schools in Langsa, Aceh province, Indonesia. The population in this study was all class X science at one of the senior high schools in Langsa.

<table>
<thead>
<tr>
<th>Population</th>
<th>Total of all students</th>
</tr>
</thead>
<tbody>
<tr>
<td>X Science 1</td>
<td>23</td>
</tr>
<tr>
<td>X Science 2</td>
<td>21</td>
</tr>
<tr>
<td>X Science 3</td>
<td>25</td>
</tr>
<tr>
<td>X Science 4</td>
<td>24</td>
</tr>
</tbody>
</table>

Sampling was taken random techniques so that the samples obtained are class X IPA 2 and X IPA 3, where class X IPA 2 is the experiential class, and X IPA 3 is the control class. The method in this study is an experimental method with a quantitative approach, techniques in data collection used with tests, namely pretest and posttest (Ridwan, 2010). To analyze the data is carried out with the following steps.

**Research Instrument Tests**

1. Validation Test

\[
r_{xy} = \frac{n \left( \sum XY \right) - \left( \sum X \right) \left( \sum Y \right)}{\sqrt{\left[ n \left( \sum X^2 \right) - \left( \sum X \right)^2 \right] \left[ n \left( \sum Y^2 \right) - \left( \sum Y \right)^2 \right]}}
\]

(Suparadi, 2017)

Notes:

\[\sum X_i\] : Number of items

\[\sum Y_i\] : Total Number of Scores
Table 2. Problem Validation Results

<table>
<thead>
<tr>
<th>Validation</th>
<th>Valid questions</th>
<th>Number of questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>1,3,4,6,7,8,9,10,11,12,13,16,17,19,21,22,24,25,27,29</td>
<td>20</td>
</tr>
<tr>
<td>Not valid</td>
<td>2,5,14,15,18,20,23,27,28,30</td>
<td>10</td>
</tr>
</tbody>
</table>

Reliability Test

\[ r_{11} = \frac{k}{k-1} \left\{ \frac{\sum_{i=1}^{k} \frac{\text{St}_i^2}{\text{St}_i^2}} \right\} \]

(Supardi, 2017)

Information:

- \( r_{11} \): Sought Reability
- \( K \): Number of questions
- \( p \): Number of people in the Sample who answered questions correctly.
- \( \text{St}_i^2 \): Total of the variance

Determine a student's Final Grade score.

The student's cognitive score is calculated from the student's correct answer, then it will be converted into a value with the following formula:

\[ \text{Final Grade} = \frac{\text{Number of correct questions}}{\text{Number of questions}} \times 100 \]

Calculating improvements in student learning outcomes

The N-Gain score test formula can be used to calculate the improvement in student learning outcomes.

\[ g = \frac{\text{S}_{\text{postest}} - \text{S}_{\text{pretest}}}{\text{S}_{\text{maksimum}} - \text{S}_{\text{pretest}}} \times 100\% \]

The results of the n-gain score can be divided into categories, namely:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;80</td>
<td>High</td>
</tr>
<tr>
<td>&gt;61</td>
<td>Medium</td>
</tr>
<tr>
<td>&gt;40</td>
<td>Enough</td>
</tr>
<tr>
<td>&gt;21</td>
<td>Very Low</td>
</tr>
<tr>
<td>( \leq 20 )</td>
<td>No improvement</td>
</tr>
</tbody>
</table>

(Supriadi, 2021)

How to determine the increase in students' learning scores in experimental and control classes can use the normalized N-gain Score formula. Then to see the difference in the improvement of the two groups, the is carried out with the 't-test. The requirement
of the t-test first performs the normality and homogeneity tests. For normality test can be done with the following formula:

\[ X^2 = \sum \frac{(O_i - E_i)^2}{E_i} \]

(Supardi, 2017)

Information:

\( X^2 \) : Chi-Squared count

\( O_i \) : Observed frequency

\( E_i \) : Theoretical frequency

While looking for the value of Homogeneity, the following formula is used:

\[ F_{\text{count}} = \frac{\text{Greatest variance}}{\text{Smallest variant}} \]

The t-Test determines used the following formula:

\[ T \text{ Count} = \frac{M_1 - M_2}{\sqrt{\frac{\Sigma x_i^2}{N_1 + N_2 - 2} + \frac{\Sigma x_2^2}{N_1 + N_2 - 2}} / \frac{(N_1 + N_2)}{(N_1 N_2)}} \]

(Supardi, 2017)

Information

\( M_1 \): Again, value experimental class

\( M_2 \): Again, value control class

\( X1^2 \): The square of the difference between \( X_1 - \bar{x}_1 \)

\( X2^2 \): The square of the difference between \( X_2 - \bar{x}_2 \)

N: Sample

For the 't-test, it is used at a level of 5% where the test criteria are as follows: If \( t \) count < \( t \)-table, then Ho is accepted and Ha is rejected, if \( t \)-count > \( t \)-table, then Ha is accepted, and Ho is rejected.

RESULTS AND DISCUSSION

Based on this research, data were obtained on student learning outcomes at one of the senior high schools in Langsa on ecosystem materials with the use of the Probing Prompting learning model. Data collection is carried out with a pretest and a posttest. The pretest is carried out at the beginning before treatment. At the same time, the posttest is given to participants when the student is given material or treatment. Here are the scores from the initial and final tests in the experiment and control classes. The difference in the results of the scores of the students studied can be seen in Table 4.
Table 4 shows that the value of posttest in the experimental group is more Sample in proving the improvement of student learning outcomes, so it can be calculated using the N gain test. Data analysts showed the average value of N-gain in the experiment class and control class. The comparison of the improvement in student learning outcomes in probing prompting learning and conventional learning is based on the diagram in Figure 1.

Figure 1 shows that the results obtained using the probing prompting model are more improved than classes with conventional learning, in Figure 1. Explained the difference in the N- Gain scores of the experiment and control groups.

From the diagram above, it can be proved that the N- gain of the experimental class is 65.09 on the medium criteria, while the class in the control class is 48.19 criteria is sufficient. Although the data from the two classes tested showed an increase in the average value of ecosystem materials based on the diagram, the N-gain value of the experiment class is more effective than the control class. The experimental class has different improvements from the control class. The t-test where the results of the t-test,
namely Ha, are accepted, namely the difference in the improvement of student learning outcomes with the application of the Probing Prompting learning model with conventional learning due to t-counting. $5.33 > t_{table}$ 1.680. Then $H_0$ was rejected.

The existence of a comparison of improving student learning outcomes in the experimental group with the control group can occur because the teaching process is not the same. The experimental group used a probing prompting learning model. Probing prompting uses questions that can explore, demand, and encourage participants to learn carefully about the answers to the questions given by the teacher and can train students to talk more so that students can express the opinions they want to express.

The learning process in the control class is carried out by conventional or lecture means where learning comes from educators (teachers). Students tend to be passive and have less participation in learning—student learning outcomes where learning outcomes in the experiment group are more improved than the control group. Relevant studies, such as Mansanaris et al. (2021), show that student learning outcomes by applying probing prompting are higher than in conventional learning. Uping’s research (2022) showed that the Probing Prompting learning model in the experimental class was superior and had a higher final score than conventional learning.

**CONCLUSION**

The application of learning models probing prompting increased student learning outcomes in ecosystem material in class X science at one of the senior high schools in Langsa. Student learning outcomes increase with the probing prompting model, and the magnitude of the increase is 65.09%.

**REFERENCES**


