The Influence Of Students’ Learning Interest On Problem Solving Ability Using Diagnostic Assessment

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Abstract

In Indonesia, the level of students' mathematical problem solving abilities can be said to be lacking due to the teacher's inability to condition a class well. So, to determine which method to use, teachers need to understand their students' abilities first, one of which is through diagnostic assessment. In this research, the researcher aims to find out whether it is possible that through diagnostic tests there is an influence on students' interest in learning on problem solving abilities in class VIII mathematics lessons at SMPN 46 Palembang. The type of research used is quantitative research with a sample of 29 students. The data collected used two techniques, namely questionnaires and also the results of diagnostic assessments. Meanwhile, the analysis used uses a technique which is a simple regression analysis test. Based on the results obtained, it shows that there is a high influence of interest in learning on the results of diagnostic assessments. The results obtained from the learning interest variable which influences the results of the diagnostic assessment in the form of problem solving abilities are results that can be said to be very high. In other words, it can be said that students' interest in learning greatly influences students' problem solving abilities as seen from the results of diagnostic assessments.

Keywords: Problem-solving Ability; Interest in Learning; Diagnostic Assessment

1. Introduction

Education is very necessary for every human being. This is in line with the understanding of education which is a factor that is very necessary to improve the quality of human resources (Feronita et al., 2018). If human resources in a country are good, then this can raise the standard of living of that country (Kamalia et al., 2020). In education, there is a subject called mathematics. A subject that has a very important role in education is mathematics. This is because the use of mathematics is found in various scientific disciplines, other words, mathematics is a universal science (Riana et al., 2020). This statement is strengthened by the opinions of Nurainah, Maryanasari, and Nurfauziah who state that scientific disciplines and everyday life with mathematics have an interrelated relationship. (Nurainah et al., 2018).

In mathematics, there are several mathematical abilities, including creative mathematical thinking, mathematical communication, spatial sense, mathematical connections, mathematical representation, mathematical self-efficacy, mathematical problem solving, mathematical anxiety, self-confidence, and self-regulated learning. (Putri et al., 2019). As has been explained, problem-solving ability is one of the mathematical abilities (Andriyani, 2022). Problem-solving in the world of mathematics is the final step in a mathematics learning process where all elements of knowledge, skills, and mathematical values are combined into a mathematical concept or idea in mathematical language. This mathematical ability can be reviewed through the student's ability to solve a problem or
Problem-solving abilities can be seen in students' skills in solving a problem. Therefore, an activity is needed to measure these skills. In education, there is something called a diagnostic assessment which can be used to diagnose or provide an analysis of students' basic abilities, one of which is problem-solving ability, and also to determine students' initial conditions. Diagnostic assessments are divided into two, namely non-cognitive assessments and cognitive assessments (Nasution, 2021). This assessment is able to provide teachers with an overview of students' abilities, including problem-solving abilities, and also being able to arrange the stages of students' cognitive development so that students are able to obtain maximum scientific knowledge.

In the process of learning, it's important to go beyond using assessments alone. Other comparisons are necessary to maximize the results of analysis. One crucial factor to consider is the individual's interest in learning. Interest denotes a strong inclination and willingness to repeatedly pay attention to and remember something. It is strongly associated with feelings of happiness. On the other hand, learning primarily involves acquiring new skills and knowledge, often through the explanation of new information and experiences. Thus, interest in learning signifies a strong motivation and psychological inclination to actively engage in activities aimed at understanding new information and experiences (Hapsari et al., 2023).

Interest in learning has several markers in it, including a tendency for high concentration and observing, active participation, a sense of enjoyment and desire to learn; an increased desire to learn and positive feelings; there is peace when carrying out learning activities, and there is space and ability to make decisions related to the learning activities that are being carried out. Steps to create interest in learning in students take many forms, one of which is providing animated videos that can attract students' attention to the ongoing learning. (Yunitasari & Hanifah, 2020).

Based on the results of Devi and Astuti's research (2023) with a research focus on the influence of learning interest on learning outcomes in school, which states that learning interest has an influence on learning outcomes in art lessons (Sagita Devi & Astuti, 2023). Apart from that, Prastika's research (2020) with a research focus on the influence of interest in learning on learning outcomes in school also stated that there is a very clear correlation between interest in learning on students' mathematics learning outcomes (Prastika, 2020). This is sufficient evidence that interest in learning is closely related to learning outcomes. However, previous research did not specifically explain what kind of learning outcomes students got. Because of this, in this study, researchers more specifically wanted to know whether there was an influence between learning interest and the results of students' mathematics diagnostic assessments.

Apart from that, there is still not much research currently discussing the influence of learning interest on diagnostic assessment results. Researchers want to know in more detail about how influential the two are. This is certainly a challenge for researchers to provide new references in the world of education. For this reason, researchers made the decision to conduct a study entitled “The Influence of Students' Interest in Learning on Problem-Solving Ability Using Diagnostic Assessment”

2. Method

In the research used, the researcher decided to conduct a quantitative type of research with a normality test as a prerequisite test. The sample used in this research was 29 students. The data collected used two techniques, namely questionnaires and also the results of diagnostic assessments. Meanwhile, the analysis used uses a technique which is a simple regression analysis test. Interest in learning is the independent variable of this research, while student diagnostic assessment is the dependent variable of the research.

The subjects in this research were class VIII students at SMPN 46 Palembang with a total of 29 students. The implementation of this research was carried out at SMPN 46 Palembang from 28 August to 16 September 2023 by considering several possibilities, including effectiveness in collecting and collecting data also this location was strategic in collecting data in the form of diagnostic assessment results and results of learning interest questionnaires related to the research subject. which will later be researched by the author.

This research is research that uses quantitative data. Quantitative data is data that is put together by prioritizing images or words rather than numbers. The data obtained is cognitive data covering diagnostic test questions which are prepared based on problem-solving indicators according to Polya,
namely understanding the problem, preparing a plan, implementing the plan, and checking again. (Putra & Hiltrimartin, 2022). The diagnostic assessment questions tested were 10 questions with two questions from class 6 material including circles and data, six questions from class 7 material including plane shapes and comparisons, and two questions from class 8 material including algebra, 25 questions on the interest questionnaire student learning with 14 positive questions and 11 negative questions.

3. Results and Discussion

3.1 Description of Research Subjects

In this study, researchers analyzed whether or not there was a relationship between variable \( x \), namely interest in learning, and variable \( y \), namely the results of diagnostic assessments in the form of problem-solving. Questionnaires regarding students' learning interests questions were given to students to fill out. In collecting the data, test techniques were used to see the results of students' diagnostic assessments and also questionnaires to identify students' learning interests. Researchers took 29 people from class VIII at SMPN 26 Palembang.

The following are each research variable:

1. The independent variable (variable \( x \)) is the learning interest of class VIII students at SMPN 46 Palembang which has an average student interest in learning of 60.45 with a standard deviation of 25.37.
2. The dependent variable (variable \( y \)) is the result of the diagnostic assessment of class VIII students at SMPN 46 Palembang which has an average student diagnostic assessment score of 53.8 with a standard deviation of 21.37.

3.2 Overview of Problem Solving

The process carried out in collecting data is by conducting tests. This test uses a diagnostic assessment to measure students' mathematical problem solving abilities. The preparation of this diagnostic assessment is adjusted to indicators in problem solving according to Polya. Research subjects were instructed to collect the results of their diagnostic assessments to researchers who would then be analyzed according to the problem solving indicators according to Polya and the assessment rubric that had been created.

3.3 Prerequisite Test

1. Normality Test

<table>
<thead>
<tr>
<th>One-Sample Kolmogorov-Smirnov Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>N 29</td>
</tr>
<tr>
<td>Normal Parameters&lt;sup&gt;a&lt;/sup&gt;&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Mean .0000000</td>
</tr>
<tr>
<td>Std. Deviation 3.6428189</td>
</tr>
<tr>
<td>Most Extreme Differences</td>
</tr>
<tr>
<td>Absolute .117</td>
</tr>
<tr>
<td>Positive .117</td>
</tr>
<tr>
<td>Negative -.112</td>
</tr>
<tr>
<td>Test Statistic .117</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)&lt;sup&gt;c&lt;/sup&gt; .200&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Monte Carlo Sig. (2-tailed)&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>99% Confidence Interval Lower Bound .372</td>
</tr>
<tr>
<td>Upper Bound .397</td>
</tr>
</tbody>
</table>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.
- e. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 20000000

The results in the picture show that 0.397>0.05, so it can be said that the residual values of the two previous variables that we tested are normally distributed. Based on the results of the normality test, it is known that the significance result is 0.397>0.05, so it can be concluded that the residual value is normally distributed.
3.4 Regression Analysis

1. Model Summary Table

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.985</td>
<td>.970</td>
<td>.969</td>
<td>3.762</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Minat Belajar Siswa

The table explains the magnitude of the correlation value or $R$, which is 0.985, as well as the percentage of influence between one independent variable (interest in learning) and one dependent variable (diagnostic assessment results in the form of problem solving ability) which is found in $(R^2)$. From the results of this table, we get a coefficient of determination $(R^2)$ of 0.970, which means that the influence of student learning interest, which is the independent variable, on the results of the student diagnostic assessment, which is the dependent variable, is 97%, while the remaining 3% is driven by several other factors outside the variable $x$. This explains the large percentage influence of students' learning interest, which is the independent variable, on the results of students' diagnostic assessments, which is the dependent variable.

2. Anova table

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12408.622</td>
<td>1</td>
<td>12408.622</td>
<td>876.737</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Residual</td>
<td>362.136</td>
<td>27</td>
<td>14.163</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12790.759</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Nilai Asesmen Diagnostic
b. Predictors: (Constant), Minat Belajar Siswa

The table explains whether there is a real and clear influence between the student interest variable (variable $x$) on the student diagnostic assessment result variable (variable $y$). From the results of the table above, it can be seen that $F_{\text{count}}=876.737$ with a significance level (probability) $<0.001<0.05$. This concludes that this model can be used to estimate diagnostic assessment outcome variables.

3. Coefficient Table

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Std. Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>3.636</td>
<td>1.832</td>
<td>1.985</td>
<td>.057</td>
</tr>
<tr>
<td></td>
<td>Minat Belajar Siswa</td>
<td>.830</td>
<td>.028</td>
<td>965</td>
<td>28.610</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Nilai Asesmen Diagnostic

The table above can be made into an equation as $y=3.636+0.830x$. The way to read the regression equation is as follows:
A positive constant value of 3.636 indicates the positive influence of the independent variable (interest in learning). If the independent variable has an effect or increases by one unit, then the variable resulting from the diagnostic assessment will also of course be fulfilled or increase as well.

The regression coefficient x of 0.830 shows that if interest in learning (variable x) increases by one unit, then the results of the diagnostic assessment (variable y) will also increase by 0.830 or 83%.

1.1 Significant Test Results for Regression Coefficients

1. Hypothesis Formulation

: There is no influence in class VIII at SMPN 46 Palembang between students’ interest in learning and the results of the mathematics diagnostic assessment.

: There is an influence in class VIII at SMPN 46 Palembang between students’ interest in learning and the results of the mathematics diagnostic assessment.

2. If, what happened was that the formulation of the above hypothesis was not approved whereas approved. Based on these results, it can be stated that there is an influence of students' interest in learning on the results of diagnostic assessments in the form of students' problem-solving abilities.

3. Determined statistical test decisions for the regression correlation coefficient

Based on the table contained previously, it can be seen that the value. So, therefore, in the formulation of the hypothesis above, it is rejected and accepted.

3.5 Discussion

In this research, the researcher aims to find out whether there is an influence between students’ learning interest and their problem-solving abilities using diagnostic assessments or not in mathematics lessons. The results obtained based on data that has been collected and processed state that the influence displayed by these two aspects is mutually influential. Referring to the research results, it is known that a positive constant value of 3.636 with a probability of 0.001 indicates a positive influence of the independent variable (interest in learning). If the independent variable has an effect or increases by one unit, then the variable resulting from the diagnostic assessment will also be fulfilled or increased as well. This can also be seen from the value. So, therefore, In the formulation of the above hypothesis is denied whereas in the formulation of the hypothesis above it is rejected while is accepted.

Based on the determinant coefficient (R2) in the table, the determinant coefficient value is 0.97, which means that there is or is an influence of interest in learning which is the independent variable on the results of the diagnostic assessment which is the dependent variable with a total of 97%, while the remaining 3% driven by several other factors from outside the variable x. This explains the large percentage influence of students' learning interest, which is the independent variable, on the results of students' diagnostic assessments, which is the dependent variable.

Other results show that the regression coefficient x is 0.830, indicating that if interest in learning (variable x) increases by one unit, then the results of the diagnostic assessment (variable y) will also of course increase by 0.830 or 83%.

Interest in learning has several markers in it, including a tendency for high concentration and observing, active participation, a sense of enjoyment and desire to learn; an increased desire to learn and positive feelings; there is peace when carrying out learning activities, and there is space and ability to make decisions related to the learning activities that are being carried out. Steps to create interest in learning in students take various forms, one of which is providing animated videos that can attract students’ attention to ongoing learning (Maulina et al., 2022). According to Permata and Kristanto (2020), Interest in learning is influenced by various things, one of which is learning tools (Permata & Kristanto, 2020). Learning devices must be of high quality. If the learning tools are appropriate, students' potential for interest in learning will increase as well as students' challenges in working on questions, for example, diagnostic assessments, will run well. Learning tools that can increase students' interest in learning are also influenced by the strategies implemented, including gamification strategies in online quizzes.
Based on previous research, no one has discussed the scope of the researcher's research title. For example, research conducted by Hikmasari, Kartono, and Mariani (2018) only discusses the analysis of diagnostic assessment results which are measured according to problem-solving abilities, there is no review of students' learning interests.

4. Conclusion

Based on the results of data processing, it is stated that there is an influence of interest in learning on the results of diagnostic assessments, namely problem solving abilities in mathematics lessons for class VIII students at SMPN 46 Palembang. It is known that F_count is 876.737 while F_table is 4.21. As a result of F_count>F_table, this states that the variable student interest in learning influences the results of the diagnostic assessment, namely students' problem solving abilities.

Based on the determinant coefficient in the table, the result of 0.97 obtained is a determinant coefficient value which can be interpreted as meaning that there is an influence of interest in learning which is an independent variable on the results of the diagnostic assessment, namely students' problem solving ability which is the dependent variable with a total of 97%, whereas The remaining 3% is driven by several other factors outside the x variable. This explains the large percentage influence of students' learning interest, which is the independent variable, on the results of students’ diagnostic assessments, which is the dependent variable.

Based on the results of the regression coefficient x of 0.830, it shows that if interest in learning (variable x) increases by one unit, then the results of the diagnostic assessment (variable y) will also of course increase by 0.830 or 83%.

Bibliography


