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STUDENTS' LEARNING ATTITUDES TOWARDS PHYSICS PROBLEM SOLVING ABILITY OF MAN 2 PALU

Sikap Belajar Siswa terhadap Kemampuan Pemecahan Masalah Fisika MAN 2 Palu

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Keywords

Student Learning Attitude

Physics Problem Solving

Abstract

This study aims to describe the relationship between student learning attitudes and problem-solving abilities in Physics at MAN 2 Palu. This research is qualitative descriptive research. The population is all students of class XI MAN 2 Palu Academic Year 2020/2021 with a sample of 38 students. The instruments used are questionnaire tests in learning physics and essays on physics problem-solving ability tests. The results of the prerequisite test results of the research are that all aspects and indicators of Student Attitudes are normally and linearly distributed and based on the feasibility test indicate that all data are eligible for regression and correlation tests. The results of the analysis of the regression test and the correlation test obtained values that were varied, insignificant, and significant. Based on the results of the research analysis, it can be concluded that the relationship between each indicator of student attitudes towards solving physics problems is four indicators that are not significant and only one indicator of student attitudes is significant. Based on the results of the regression test, correlation, and determination test, it can be concluded: 1. Students' attitudes in learning physics have an effect on physics problem-solving ability but the effect is small. While the attitude in studying physics does not affect the ability to solve physics problems. 2. The relationship between attitudes in learning physics to problem-solving abilities in physics, there is a relationship between aspects of learning physics and problem-solving abilities in physics. While the attitude in studying physics there is no relationship. 3. The contribution of students' learning attitudes to physics problem-solving abilities is 12.96%.

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Abstrak

Penelitian ini bertujuan untuk mendeskripsikan hubungan antara sikap belajar siswa dengan kemampuan pemecahan masalah Fisika di MAN 2 Palu. Penelitian ini merupakan penelitian deskriptif kualitatif. Populasi adalah seluruh siswa kelas XI MAN 2 Palu Tahun Pelajaran 2020/2021 dengan sampel sebanyak 38 siswa. Instrumen yang digunakan adalah tes angket pembelajaran fisika dan tes kemampuan pemecahan masalah fisika. Hasil uji prasyarat hasil penelitian adalah bahwa semua aspek dan indikator Sikap Siswa berdistribusi normal dan linier dan berdasarkan uji kelayakan menunjukkan bahwa semua data memenuhi syarat untuk uji regresi dan korelasi. Hasil analisis uji regresi dan uji korelasi diperoleh nilai yang bervariasi, tidak signifikan dan signifikan. Berdasarkan hasil analisis penelitian dapat disimpulkan bahwa hubungan antara masing-masing indikator sikap siswa terhadap penyelesaian masalah fisika ada empat indikator yang tidak signifikan dan hanya satu indikator sikap siswa yang signifikan. Berdasarkan hasil uji regresi, uji korelasi dan uji determinasi dapat disimpulkan: 1. Sikap siswa dalam pembelajaran fisika berpengaruh terhadap kemampuan pemecahan masalah fisika tetapi pengaruhnya kecil. Sedangkan sikap dalam mempelajari fisika tidak berpengaruh terhadap kemampuan menyelesaikan masalah fisika. 2. Adanya hubungan antara sikap dalam pembelajaran fisika dengan kemampuan pemecahan masalah pada fisika, terdapat hubungan antara aspek pembelajaran fisika dengan kemampuan pemecahan masalah pada fisika. Sedangkan sikap dalam belajar fisika tidak ada hubungan. 3. Kontribusi sikap belajar siswa terhadap kemampuan pemecahan masalah fisika sebesar 12,96%.

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INTRODUCTION

Physics is considered one of the most prominent and problematic subjects by students in the realm of Science [1]. Students perceive physics as a difficult subject during their high school days and become more evasive when they reach college.

Attitudes in learning are very important, and attitudes that exist in learning towards subjects at school. Therefore, attitude towards science can mean an attitude tendency that can take the form of acceptance or rejection of science itself or physics in particular. Student attitudes are important, but not only students who play an important role in achieving positive attitudes towards physics lessons. However, the teacher as a subject is also involved in the education and learning process. Teachers are not only focused on attitudes to learning physics but also have to understand students' attitudes [2].

The teacher plays an important role, regarding attitudes during the process of learning a subject, the teacher must know the student's attitude towards the subject of Zuhera (2017) [3] and Maison, et al, (2020) [4]. The positive attitude of students towards physics subjects is seen when students are enthusiastic during the learning process and there is the interaction between students and teachers in the learning process [5].

Attitudes towards subjects as well as attitudes and study habits must be possessed by students because by getting used to being disciplined and studying well, satisfactory learning results will be obtained. (Gusniwilda, 2014) [6]. Tus (2020) [7], Attitudes towards subjects and attitudes towards study habits are important things for students to have to increase students' intellectual knowledge. According to Nur, (2008) [8], intellectual skills can be obtained by interacting with their environment. One of the stages of intellectual skills is the ability to solve problems which is the highest stage of intellectual skills. At this stage, it is hoped that everyone will be able to combine previously understood rules, propositions, and theories to reach a solution that produces higher-level rules by having an attitude towards the subject and an attitude in learning.

Raymond, (2020) [9], and Nina Sturm, (2021) [10] state that student attitudes can affect problem-solving abilities. Meanwhile, Simanjuntak (2016) [11], obtained the strength of the relationship between students' attitudes towards lessons and learning of 58.90%. Based on the problems mentioned above, it examines student attitudes towards lessons and student attitudes in the learning process with problem-solving abilities.

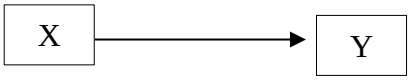
The indicators of student attitudes in research by researchers are (1) students' attitudes in studying physics, and (2) students' attitudes in studying physics towards students' ability to solve physics problems. Based on the background described above, the formulation of the problem is to describe the relationship between students' attitudes towards the physics problem-solving ability of MAN 2 Palu students.

RESEARCH METHODS

This research is a descriptive study with a quantitative approach, to explain the attitudes of students towards physics problem-solving abilities about the Doppler effect.

The research design is to provide an overview that shows the relationship between students' attitude variables and problem-solving variables.

The research design drawings are:



Information:
X: Attitude of students in the lesson and learning physics
Y: Problem-solving ability

This research was conducted at MAN 2 Palu, Central Sulawesi in the 2020/2021 Odd Semester.

Sampling using the purposive sampling technique with the number of research samples used in 1 class, amounting to 38. The data collected directly by the researchers consisted of the independent variable (Y) from the questionnaire distributed to students via Google Form. The data for the dependent variable (Y) was obtained from the physics problem-solving test for the 2020/2021 school year using Google Form. The research instruments used in this study were: Student Attitude Questionnaire Sheet used to measure student attitudes, Physics problem-solving ability test sheet.

Analysis of research data was carried out using the SPSS (Statick Product And Service Solution) program. The normality test is done by equation. Kolmogorov Smirnov are as follows [12]:

$$KS = 1{,}36\sqrt{\frac{n_1+n_2}{n_1\times n_2}} \qquad (2.1)$$

Linearity testing is carried out to know whether the two variables have a significant linear relationship or not. A good correlation

should have a linear relationship between the independent variable (X) and the dependent variable (Y).

A simple linear regression test was performed to calculate the regression equation. To predict how high the value of problem-solving abilities will be if the value of students' attitudes is changed and to find out the direction of the relationship between student attitudes and physics problem-solving abilities, whether positive or negative by using the equation,

$$Y' = a + bX \quad (2.2)$$

The test criteria were used to determine whether there is a relationship between student attitudes and problem-solving abilities. to find out the close relationship between student attitudes and physics problem-solving abilities and to determine the direction of the relationship. Person Correlation Parametric Test Normal Data is said to have a relationship if the value of $r_{count} > r_{table}$. From the data obtained, the correlation coefficient can be calculated by the formula:

$$r_{xy} = \frac{n(\Sigma xy)-(\Sigma x)(\Sigma y)}{\sqrt{[n(\Sigma x^2)-(\Sigma x)^2][n(\Sigma y^2)-(\Sigma y)^2]}} \quad (2.3)$$

Provided that the value of rxy is not more than the price ($-1 \leq r_{xy} \geq +1$). If $r_{xy} = -1$ means the correlation is perfectly negative. If $r_{xy} = 0$ it means there is no correlation. And if $r_{xy} = +1$ it means the correlation is positive.

The quantitative functional influence between students' attitudes (X) on physics problem-solving abilities (Y), is used with a determination test in the following equation:

$$D = r^2 \times 100\% \quad (2.4)$$

RESULTS AND DISCUSSION

The results of the regression test on students' learning attitudes towards physics problem-solving abilities obtained a significance value of 0.043, smaller than 0.05, which means that there is a significant effect of student learning attitudes on physics problem-solving abilities.

Based on the results of the regression test on the attitude indicator in learning physics on physics problem-solving ability, there is a significant value of 0.012 which is smaller than 0.05 which means that there is a significant influence between aspects of attitude in learning physics on physics problem-solving ability. While the regression test on the aspect of attitude in studying physics on physics problem-solving ability there is no significant value because the data obtained in the regression test of the attitude aspect in studying physics is 0.172 which is greater than 0.05 which means that in the regression test on this aspect there is no or there is no influence between aspects of attitude in studying physics with physics problem-solving ability.

The results of the regression test on the first aspect, namely attitudes in learning physics affect solving physics problems because students' attitudes towards physics can be in the form of positive attitudes and negative attitudes. A positive attitude is an attitude that can help students appreciate physics subjects and help students develop self-confidence in their abilities. Conversely, a negative attitude is the opposite of a positive attitude itself, namely an attitude that cannot help students appreciate physics subjects and cannot help students develop confidence in their abilities.

The negative attitude of students is that some students do not like physics. The causes include general perceptions of the difficulty of physics-based on other people's opinions, learning experiences in class caused by the learning process that does not attract students' attention, experience in class as a result of teacher treatment, perceptions formed by failure to learn physics and not knowing the usefulness of physics.

The results of the regression test on the second aspect, namely attitudes in studying physics do not affect solving physics problems. The success of students in solving physics problem-solving problems is not only in the attitude of studying physics but there are other factors. Motivation to learn students' interest in learning physics also affects students' attitudes towards studying physics.

The test of determination of students' attitudes towards problem-solving skills is 10.9%, the indicator on student attitudes that has the most dominant influence on solving physics problems is the indicator of willingness to learn and apply physics subject matter by 37.5% while the remaining 62.5% are factors outside the unexplored.

The results of the regression test on indicator 1, namely students understand and believe in the importance of studying the objectives and content of physics lessons on physics problem-solving abilities are 0.861 > 0.05. These results indicate that there is no effect of indicator 1 on physics problem-solving abilities.

The results of the regression test for indicator 2, namely the willingness to learn and apply physics subject matter to physics problem-solving abilities of 0.02 < 0.05. These results

indicate that indicator 2 affects the ability to solve physics problems.

The results of the regression test for indicator 3, namely the seriousness in physics lessons on physics problem-solving ability of 0.262 > 0.05. These results indicate that there is no effect of indicator 3 on the ability to solve physics problems.

The results of the indicator 4 regression test, namely the pleasure to solve physics problems on the physics problem-solving ability of 0.207 > 0.05. These results indicate that there is no effect of indicator 4 on the ability to solve physics problems.

The results of the regression test for indicator 5, namely the desire to get a good achievement in physics lessons on physics problem-solving ability of 0.713 > 0.05, there is no effect between indicator 5 on physics problem-solving abilities.

The results of the correlation test on students' attitudes towards physics problem-solving abilities above are significant which obtains results of 0.043 which are smaller than 0.05, which means that there is a significant correlation between students' attitudes and physics problem-solving abilities.

The results of the correlation test on the first aspect, namely the attitude in learning physics, which is significant, has a value of 0.012 which is smaller than 0.05, which means that there is a significant correlation between aspects of learning physics and the ability to solve physics problems. While in the correlation test for the second aspect, namely the attitude in studying physics to the ability to solve physics problems, there is no significant correlation because the data obtained in the correlation test for the attitude aspect in studying physics is 0.172, which is greater than 0.05, which means that the correlation test on this indicator there is no significant correlation or no effect between attitude indicators in studying physics and physics problem-solving ability.

The correlation between indicator 1 is that students understand and believe in the importance of studying the objectives and content of physics lessons with physics problem-solving abilities of 0.861 > 0.05, so it can be concluded that there is no relationship between indicator 1 and physics problem-solving abilities. For the results of the correlation test of indicator 2, namely the willingness to study and apply physics subject matter with physics problem-solving abilities of 0.02 < 0.05, it can be concluded that there is a relationship between indicator 2 and physics problem-solving abilities.

Student attitudes that affect problem-solving abilities (Sinta D. S. 2016) [13]. and research conducted by Raymond, (2020) [14] states that attitudes directly affect problem-solving abilities.

The results of the correlation test for indicator 3, namely seriousness in physics lessons with physics problem-solving abilities, are 0.262 > 0.05, so it can be concluded that there is no relationship between indicator 3 and physics problem-solving abilities. For the results of the correlation test of indicator 4, namely the pleasure to solve physics problems with physics problem-solving abilities of 0.207 > 0.05, it can be concluded that there is no relationship between indicator 4 and physics problem-solving abilities. For the results of the correlation test of indicator 5, namely the desire to get good achievement in physics lessons with physics problem-solving ability of 0.713 > 0.05, it can be concluded that there is no relationship between indicator 5 and physics problem-solving ability.

The relationship between student attitudes and problem-solving abilities shows a positive correlation or relationship, where the more positive the attitude possessed by students when receiving physics lessons, the higher problem-solving abilities obtained by students.

The relationship between each aspect of attitude and problem-solving ability, the correlation of aspects of attitude in learning physics to physics problem-solving ability shows that there is a correlation between these two aspects of physics problem-solving ability. Reymond, (2020) [14], revealed that students' solutions to solve physics problems are important in determining which strategies should be used by teachers to deal with this situation and in encouraging students to find more interesting physics perspectives.

Meanwhile, the correlation between the attitude towards the teacher and the physics problem-solving ability shows no correlation. The correlation level of 0.375 in this aspect indicates a low criterion. For the correlation value of the attitude aspect in studying physics to problem-solving ability, rxy = 0.408, the correlation level in this aspect shows moderate criteria. For the correlation value of the attitude aspect towards physics teachers with the results of jar problem-solving abilities, namely rxy = 0.109, the correlation level in this aspect shows very low criteria and for the calculation of the coefficient of determination, the contribution of students' attitudes towards physics problem-solving abilities is 12.96%. , while the remaining 87.04% is influenced by other factors that are not the object of research.

The relationship between attitude and problem solving can be influenced by various things, both by factors originating from within the individual student, as well as factors

originating from outside the individual student. Factors that come from within students include the drive for achievement, responsibility for assignments, appreciation for assignments, and opportunities to develop student character. Factors that come from outside the individual are the learning environment situation, interpersonal relationships between students and teachers, and with fellow students [15].

CONCLUSION

Based on the results of inferential analysis of linear regression test, and linear correlation test on each indicator of students' attitudes towards problem-solving abilities. It can be concluded:

1. Students' attitudes in learning physics have an influence on physics problem-solving abilities but the effect is small. While the attitude in studying physics does not affect the ability to solve physics problems.
2. The relationship of attitudes in learning physics to physics problem-solving abilities, there is a relationship between aspects of learning physics and physics problem-solving abilities. While the attitude in studying physics there is no relationship.
3. The contribution of students' learning attitudes to physics problem solving abilities is 12.96%.

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