PILLAR OF PHYSICS EDUCATION
Vol. 17 (2), 2024, page.107-117
ISSN (Print) : 2337-9618
ISSN (Online) : 2684-8880

Analysis of Student Difficulties in Solving Questions Newton's Law of Motion at State Senior High School 1 Ranah Batahan

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ABSTRACT

The results of the documentation analysis of physics learning outcomes for students of class X Ranah Batahan 1 Public High School, showed that student learning outcomes on Newton's law of motion material occupied the lowest value compared to other materials. That is, students have difficulty in solving problems related to Newton's laws of motion. This study aims to a) Knowing how the tendency of students' difficulties in solving Newton's law of motion material problems at State Senior High School 1 Ranah Batahan b) Knowing the factors of difficulty experienced by students in solving Newton's law material questions about motion in State Senior High School 1 Ranah Batahan, c) Knowing how the teacher's learning strategy on Newton's law of motion at State Senior High School 1 Ranah Batahan. This research is included in the type of descriptive research with a qualitative approach. The research sample was taken usiing the Stratified Random Sampling technique. The number of samples obtained is 27 students who represent students with high, medium and low grades and physics teachers who teach at schools. Research data about students' difficulties in solving problems were obtained through 10 questions about Newton's law of motion, data on student difficulty factors and teacher learning strategies were obtained using a questionnaire. The research instrument used has met the feasibility through a validation test by 3 validator lecturers. Data processing is done through the percentage technique. The results showed that a) The tendency of students' difficulties in Newton's law of motion was in the category of high difficulty with a percentage value of 67%, b) Factors causing student difficulties in terms of internal factors were health factors of 58%, interest factors of 48%, talent by 44%, motivation factor by 46%, and habit factor by 48%. Judging from the external factors include the teacher factor with a score of 57%, environmental factors by 40%, and the characteristics of the subject matter of 48%. This percentage figure shows that these factors are low to be the cause of students' difficulties in solving problems, and c) The teacher's learning strategy on Newton's law of motion is in moderate criteria. In general, the teacher has not finished instilling the important concepts needed in discussing Newton's laws of motion.

Keywords :*Put your keywords here; keywords are separated by semi colon.*

I. INTRODUCTION

Science and technology in the 21st century is felt very rapidly [1]. Technological advances have produced many machines and intelligent robots that replace human muscle work so that human work becomes easier and of higher quality [2]. If examined further, the various technological advances achieved to date are dominated by the application of physics [3]. Therefore, the existence of physics is relevant to technological developments. Physics itself is one of the branches of Natural Sciences that is studied as one of the subjects in high school which is included in the specialization group [4]. Physics lessons are one of the important aspects that need to be taught to students in schools since elementary, middle, and higher education. In addition, physics lessons are lessons that provide knowledge about the universe to train thinking and reasoning.

If we review the characteristics of physics, the object of study is the state and nature of matter in nature, as well as various interactions and phenomena that occur in nature. The object of this research is studied by following the steps of the scientific method, concluded and described as Physics which contains the concepts, principles, theories, and laws of Physics. The contents of this Physics science have changed the world a lot with

the resulting technology. Mastery of physics is very important for students, so that each individual becomes technologically literate, and can interact with nature and technological products, so that every individual who masters physics concepts well has the ability to adapt well to the surrounding resulting technology product.

The basic goal of any science, especially physics is to seek general knowledge in the form of reliable theories, laws, rules, and principles. That is, but what is needed from studying physics is to provide an illustration that every principle, and theory of physics does not occur by chance, through long processes and stages. Real physics learning is not just memorizing words, but also the result of experience associations [5]. In this case, thinking skills are needed, in addition to numeracy skills, skills and observation, communication skills, and skills to respond to a problem critically. Because students have good physical strength, this subject must be followed well by students, and are interested in pursuing it.

To accommodate this, the government has made various efforts, including revamping the curriculum which is currently in transition between the 2013 curriculum and the independent learning curriculum, empowering MGMP, teacher training, adding facilities and infrastructure including providing student learning materials with hope. to improve students' abilities. In addition, the principal also strives to always improve the knowledge and thinking competence of students. The achievement of high UN results and student acceptance in higher education is the main goal of every educational unit. Meanwhile, teachers are also expected to be active in improving learning and adapting learning from the old model of the mastery index or thinking in or to the implementation and evaluation stages of learning outcomes.

Students' mastery of physics at the high school level is still not as expected. This can be reviewed based on the physics learning outcomes of students of State Senior High School 1 Ranah Batahan for the 2021/2022 academic year. Documentation data shows that the average value of student learning outcomes for Newton's laws of motion material occupies the lowest average compared to other physics materials, which is 50 in the average value range of 50-75. shows that in learning Newton's laws of motion the material is not conducive so that students still have learning difficulties. The low value of students can not be separated from the inability of students to solve problems.

Many factors are caused by the ability to solve problems, some of the factors that often stand out are those related to internal factors and external factors. In terms of internal factors, it can be seen from health factors, interests, talents, motivation, self-readiness, student attention, talent, IQ, and study habits as well as how students perceive learning. Such as being less motivated in the material presented by the teacher, less trying to understand the material, basic concepts that have not been mastered. Meanwhile, in terms of external factors, it can be seen from the factors of the learning environment, the relationship with the teacher and the characteristics of the subject matter. The learning process does not attract attention and is not in accordance with the character of the student concerned. Another cause that can be a student learning difficulty is that students have difficulty determining mastery of the difficult parts of all the material that they must learn. In general, the tendency of students to learn is low. While the tendency of teachers to teach using the lecture method. In general, when asked if the teacher has implemented the 2013 curriculum, in its implementation the teacher does not seem intense with the 2013 curriculum, asking questions and formulating problems is not visible, students tend to be passive and disconnected, do not pay attention to the teacher and rarely solve problems completely. The tendency of student activity and the general habits of the teacher certainly indicate whether in learning Newton's law there are also problems with these difficulties.

Several previous studies have shown that Newton's laws of motion are still a difficult subject to solve. For example, research conducted by [6] in Malang, it turns out that students still have difficulty interpreting inertia on objects, have difficulty identifying what force acts on falling objects and students are still unable to determine the magnitude of the force. compel. interaction between objects. two objects [6] and the results of the study Ayu found that students had difficulty in defining and understanding the formula $F = 0$, understanding the action and reaction forces and identifying the forces using free diagrams [7]. Smith and Wittman in America, found that students still experience errors in determining the magnitude of the interaction force between two objects of different mass and difficulty in relating the resultant force, velocity [8] and acceleration as well as research conducted by David in South Australia, students still have difficulty identifying the force on an object when the object is thrown vertically upwards [9] and Singh & Schunn, making free-body diagrams to solve problems related to Newton's Second Law [10] and research by Rosenblatt & Hekler students have difficulty in determining the resultant component of the force [11]. These difficulties can occur due to differences in students' empirical experiences and difficulties in describing phenomena and then bringing them into physics concepts [12]. This is usually caused by the low motivation to learn physics students. Students are not only required to

work on problems using formulas, but also have to understand the meaning of the questions and their application in everyday life.

The ability of teachers in teaching will also affect student learning outcomes. Students will have difficulty in learning because of the use of inappropriate learning strategies [13]. Learning strategies can also directly affect student achievement. This statement is also supported by Adekoge and Ajadi who state that the low achievement in learning physics occurs due to the use of inappropriate and less effective teaching methods [14]. The results of Ulstad show that teacher support is very important related to meeting student needs, because it will affect students' self-competence and will be used in predicting ideal learning strategies. This is in line with what was expressed by Kusumaningrum, namely teacher support has an effect on student learning achievement [15]. In line with the statement above, according to Adegoke and Ajadi, it is stated that teacher characteristics, teacher teaching skills affect student learning achievement in the field of physics. The selection of learning strategies at the planning stage and the use of these strategies will certainly be able to improve student evaluation results which will lead to optimal achievement. Optimal achievement can occur if teachers are able to develop their knowledge and are able to carry out teaching skills, teachers must have sufficient knowledge and understanding of strategies, methods and educational media as communication tools so that the teaching and learning process is more effective.

Based on the description above, this study aims to find out how the tendency of students' difficulties in solving problems related to Newton's laws of motion are, to find out the factors that cause students' difficulties in solving problems of Newton's laws of motion and to find out how learning strategies are used. teacher on Newton's law of motion at State Senior High School 1 Ranah Batahan.

II. METHOD

This researc is a descriptiv study with a qualitative approach. In this study, events in the field are described objectively.

Population is the population is the whole of the object of research which consists of objects that have certain qualities and characteristics determined by the researcher to be studied and drawn conclusions ". The population used in this study were all students at State Senior High School 1 Ranah Batahan who had studied physics on Newton's laws. The sample is part of the number and characteristics possessed by the population. The sample in this study were all students of class XI Mathematics and Natural Sciences and physics teachers who teach at State Senior High School 1 Ranah Batahan. The number of students sampled in this study was chosen randomly, referring to the number of teachers who teach and grouping student scores with the criteria of low grades, medium grades and high grades (strata grades). Details of the data regarding the determination of the sample in each class are shown in table 3 below.

Table 1. Distribution of Research Samples

Class	Number of People		
	Student		
	Smart	**Moderate**	**Stupid**
XI MIPA 1	3	3	3
XI MIPA 2	3	3	3
XI MIPA 3	3	3	3
Number Of Samples	27 People		

Based on Table 1, in class XI MIPA there is only 1 teacher who teaches in the class and there are 3 classes, the number of students taken as samples for each class is 9 people representing 3 smart students, 3 moderate students and 3 poor students. The total number of student samples was 27 people, consisting of 9 students for each level of high, medium, and low grades.

Research variabless are everything in any form determined by theresearcher to be studied so that informationeis obtained about it, then conclusiions are drawn. This study suggests a single variable, namely the students' difficulties in solving problems related to Newton's laws of motion. Research data is a collection of facts that are used as information in conducting research. There are two types of data in this study, namely primary data and secondary data. Primary data in this study is data obtained from questionnaires filled out by students and secondary data is student learning outcomes data obtained from material mastery test questions Newton's Law of motion In this study, the instrument used was a written test question and a questionnaire on the factors of students' difficulties in solving the questions plus a teacher learning strategy questionnaire to

strengthen the data obtained in addition to the test. The tendency of students' difficulties in solving problems is measured by using test questions that are used consisting of 10 questions that contain material indicators of Newton's laws of motion. Difficulty factors and teacher learning strategies were measured using a questionnaire instrument. Questionnaire for students consists of 35 statements arranged based on the instrument grid, then the instrument grid is arranged in the form of positive/negative questions. Questionnaire for teachers is used to find out how teachers teach strategies on Newton's law of motion. This questionnaire is compiled based on the instrument grid, which is then arranged in the form of positive questions

III. RESULTS AND DISCUSSION

The resuts of The study will be explained about the data obtained at the time of the study. The data obtained in this study were in the form of student test data on Newton's law of motion and students' difficulty factors in solving problems with Newton's law of motion obtained through filling out questionnaires by students and teacher teaching strategy data on Newton's law of motion. The research data will be explained as follows.

a. Overview of Student Test Results in Solving Material Problems on Newton's Laws of Motion

Table 2. Class Data of Student Test Results

Class Interval	Frequency	Percentage	Category
20 – 29	11	41%	Tall
30 – 39	7	26%	Tall
40 – 49	1	4%	Currently
50 – 59	4	15%	Currently
60 – 69	2	7%	Low
70 – 79	2	7%	Low
Amount	**27**	**100%**	

Table 2. shows the range of test scores for 27 students on Newton's law of motion. The number of students who scored in the interval 20-29 were 11 people with high difficulty category. The number of students who scored in the 30-39 interval was 7 people with high difficulty category. The number of students who scored in the 40-49 interval was 1 person with moderate difficulty category. The number of students who scored in the 50-59 interval was 4 people with moderate difficulty category. The number of students who scored in the 60-69 interval was 2 people with low difficulty category. The number of students who scored in the 70-79 interval was 2 people with low difficulty category.Based on the result of statistical calculations, the data obtaned from student tests on Newton's law of motion in table 3 below.

Table 3. Highest value, Lowest value, Average value, and Median

N	The Highest Score	Lowest Value	Average	Median	Standard Deviation
27	75	20	41,9	36,5	24

Table 3 shows that the highest score of student test results on Newton's law of motion material is 75 and the lowest score obtained by students is 20. The median value of the value is 36.5 and the average student test result is 41.9 with a standard deviation of 24.

The data contained in table 2 can also be presented in the following graphic form

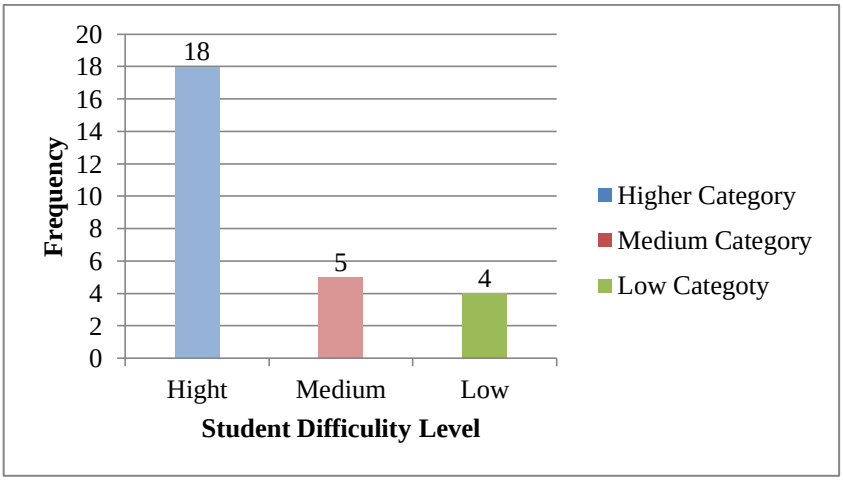

Figure 1. Graph of student difficulty data in solving test questions

Based on the data obtained and depicted in the graph above, it can be seen that the level of difficulty of students in solving Newton's law material test questions about motion, which is shown as many as 18 students out of 27 students are in the high difficulty category. This shows the tendency of students of class XI MIPA at State Senior High School 1 Ranah Batahan to have difficulty in solving problems related to Newton's laws of motion.

b. Factors of student difficulty in solving problems related to Newton's law of motion

Data on the factors of students' difficulties in solving problems related to Newton's law of motion were obtained using a questionnaire given directly to students. This data is accumulated through 35 instrument statement items contained from statements 1 to 35 in the questionnaire. Filling out student questionnaires is done by giving a value of 1, 2, 3, or 4 in the answer choice column contained in the questionnaire according to what students feel. Based on 35 questionnaire items regarding students' difficulties in solving problems on Newton's law of motion, they are grouped according to the categories in the questionnaire.

Data on students' difficulty factors in solving problems with Newton's law of motion is divided into two parts, namely internal factors and external factors.

1) Internal Factors of Students' Difficulty in Solving Newton's Law Material Problems

The internal factor of students' difficulties in solving Newton's law material questions about motion there are 5 questionnaire indicators and each indicator of internal factors contains positive and negative statements.

Table 4. Categories of Internal Factors of Learning Difficulties by Percentage

No	Internal Factor Indicator	Average Score	Max Score Average	% Achievements	Category
1	Health	2,3	4,00	58%	High
2	Interest	1,9	4,00	48%	Low
3	Talent	1,7	4,00	44%	Low
4	Motivation	1,8	4,00	46%	Low
5	Habit	1,9	4,00	48%	Low

Table 4. shows the average maximum score of the student's difficulty factor for solving Newton's law material problems regarding motion in terms of internal factors is 4.00. The student's health factor with a percentage of 58% is in the high category. The student interest factor with a percentage of 48% is in the low category. The talent factor obtained a percentage of 44% in the low category. The students' motivation factor to get a percentage of 46% is in the low category. The habit factor of obtaining a percentage of 48% is in the low category. Based on the data above, it shows the interests, talents, motivations and habits of students in solving problems related to Newton's law of low motion.

After obtaining the above data, a graph of the percentage of achievements can be made as follows:

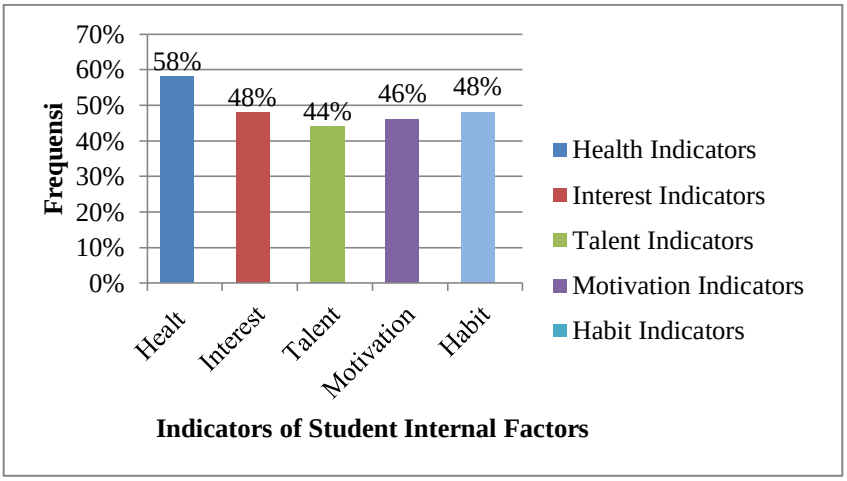

Figure 2. Graph of Student Internal Factor Indicator Data

Based on the data obtained and depicted in the graph abov, it can be seeen that the student's health factor is high with a percentage of 58%, meaning that the student's health factor does not affect students' difficulties in solving problems. Factors of interest, motivational talent and habits of students are in the low category, which means that these factors influence students' difficulties in solving Newton's law of motion material problems.

2) External Factors Students' Difficulties in Solving Newton's Law Material Problems

Enter the second factor causing student difficulties, namely external factors. In this external factor, there are 3 factor indicators.

Table 5. Categories of External Factors of Learning Difficulties by Percentage

No.	External Factor Indicator	Average Score	Max Score Average	% Achievements	Category
1	Teacher	1,8	4,00	47%	Low
2	Environment	1,6	4,00	40%	Low
3	The characteristics of the Subject Matter	1,9	4,00	47%	Low

Table 5 shows the average maximum score of the student's difficulty factor for solving Newton's law material problems regarding motion in terms of external factors is 4.00. The teacher factor obtaining a percentage of 47% is in the low category. Student environmental factors with a percentage of 40% are in the low category. The characteristic factor of the subject matter obtained a percentage of 47% in the low category. Based on the data above, it shows that teacher factors, learning environment factors and characteristics of physics subject matter are low so that it can cause students to have difficulty in solving Newton's law of motion material problems.

After obtaining the above data, a graph of the percentage of achievements can be made as follows:

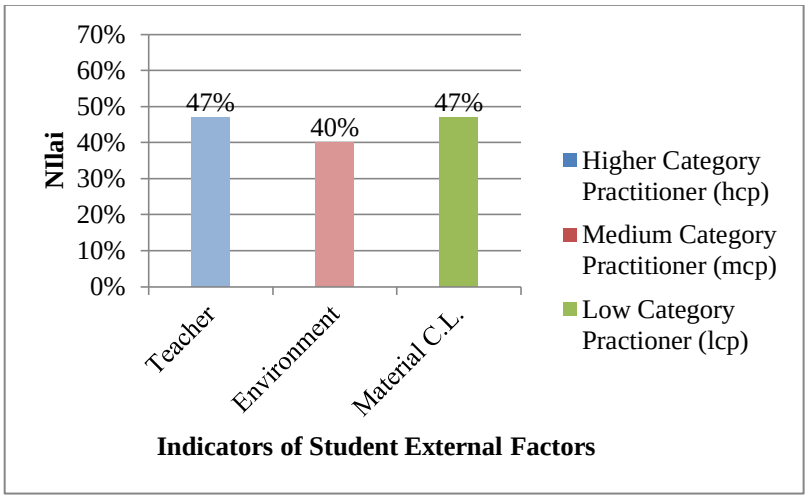

Figure 3. Graph of Student External Factor Indicator Data

c. Teacher Learning Strategies on Newton's Law of Quiet Motion

The teacher's learning data strategy on Newton's law of motion was obtained using a questionnaire given directly to the teacher consisting of an open questionnaire and a closed questionnaire. This data is accumulated through 25 statement items contained from statements 1 to 25 questions for an open questionnaire. Filling in the teacher's questionnaire is done by giving a value of 1, 2, 3, or 4 in the answer choice column contained in the questionnaire according to the actual situation. Based on 25 closed questionnaire items and 15 open questionnaire questions regarding teaching strategies to teach Newton's law material about the possibility of teacher movement in accordance with teaching strategy criteria. Based on data analysis, it can be seen that the teacher's strategy in learning Newton's law of motion from two teachers is in the medium category. Analysis of the data can be seen that in general the teacher has not instilled the important concepts needed in discussing Newton's laws of motion so that students have wrong perceptions and make students unable to answer test questions. Such as: 1) The teacher has not instilled the relationship between normal force and gravity, friction and attraction and the angle of inclination so that the general perception of normal force is always the same as gravity, 2) The teacher does not explain correctly about the forces acting on objects so that students assume objects -objects that are at rest if given a force will remain and assume there is no problem there is no static force, 3) The teacher does not explain enough about the explanation of the forces acting on objects and free force diagrams, 4) The teacher does not explain about the force. case examples correctly. For example, when the car is braked, it shows when pushing forward the teacher does not explain why it can happen, 5) In explaining the nature of the inertia of objects the teacher does not explain the concept information in solving clearly, and the teacher also does not provide illustrations of examples that often such as issuing ketchup from a bottle, walking fast on fire, 6) In explaining the concept of action and reaction forces the teacher does not explain the principles of Newton's laws. Like not explaining the pair of gravity with the normal force on the book on the table as a pair of action and reaction forces.

Based on the data from the answers to the teacher's questionnaire, it can be sen that the strategies and methods of teaching teachers in physics learnng, especially Newton's law of motion, have not been completed, so that students have difficulty in solving the test questions given. The purpose of this research is to analyze the difficulties of students in solving Newton's law of motion, the factors that cause students to have difficulty in solving problems and how the teacher's teaching strategy is on Newton's law of motion State Senior High School 1 Ranah Batahan. From the results of the tests given, it was found that students still had difficulties in understanding Newton's law of motion. This is shown from the results of the tests given generally students do not complete. The results of the analysis showed as many as 4 students were in the low difficulty category with a percentage of 14%. Furthermore, as many as 5 students were in the moderate difficulty category with a percentage of 19%, as many as 18 students were in the high difficulty category with a percentage of 67%. From this analysis, it can be seen that the students of class XI Mathematics Natural Sciences State High School 1 Ranah Batahan are in high difficulty in solving problems related to Newton's laws of motion. The thing that makes students have difficulty in solving problems in the high category is caused by factors that affect students in their learning. These factors can be seen from the analysis of the questionnaire given to students after working on Newton's law materil test questions about motion.

The difficulty factor of students in solving problems is divided into two factors, namely internal factors and external factors [16]. Internal factors are factors that come from students themselves which include physical conditions, talents, interests, motivations and student study habits [17]. While external factors are factors that come from outside the students themselves which include the teacher, the learning environment and the characteristics of the subject matter. The discussion of the results of the research is emphasized to answer the research questions that have been formulated.

The results showed that the health factors of class XI MIPA students were includeed in the high category wiith an averagee max score of 58%, meaning that the visual conditions and the general health or fitness conditions of students were in good condition. This is certainly very supportive of students in learning Newton's law of motion because a person's fitness has an effect on their learning [18]. In accordance with research data regarding student health, it can be stated that health factors are not a factor that causes students' learning difficulties in Newton's law of motion.

Based on the research data that has been analyzed, it is known that the student's interest factor in solving problems with Newton's law of motion is in the low category of 48%, which means that students' interest in solving problems is low. Interest or interest of students in the lesson will affect the learning process. The stronger the interest in the subject, the easier it will be for students to understand and master and be able to solve the subject matter. Because with a strong interest, students will try hard to master what they are interested in. However, if students are not interested in the subject, in this case solving the problem, the student will have difficulty [19]. In accordance with research data regarding student interest factors, it can be stated that low student interest is a factor that causes students' difficulties in solving Newton's law of motion problems [20].

The students' talent in solving Newton's law material problems is low with a score of 44%. The talent of a student can be seen from the ease with which the student understands the material presented by the teacher so that students can solve the problems given by the teacher. Studying in the appropriate field will increase the likelihood of success. Students will easily learn something if it is in accordance with their talents [21]. But if the student's talent is low, it will tend to be difficult to master it [18]. So it can be said that low talent can cause students' difficulties in learning. Based on the results of the research and the statement above, the talent factor of class XI students of State Senior High School 1 Ranah Batahan certainly strongly supports the success of students in learning physics. As it is known that students will easily learn something if it is in accordance with their talents.

The results of data analysis that examines motivational factors show that students' motivation in solving Newton's law material questions is low with a score of 46%. Learning motivation is a mental force that encourages the success of the learning process and understanding the learning material. Students who have high motivation show positive behavior when learning takes place. This can be seen from the enthusiasm of students to follow the lesson and enthusiasm of students when working on questions or assignments given by the teacher. The high motivation of students, one of which can be seen from the perseverance that does not give up easily to achieve success [21]. Motivation is generally influenced by high student interest. It will indirectly encourage students to follow the lesson enthusiastically. Teachers or other related parties can increase student learning motivation. Based on the data obtained from the study, it was found that low student motivation means that the student's motivation factor is the cause of students' difficulties in solving problems with Newton's law of motion at State Senior High School 1 Ranah Batahan.

The results of data analysis showed that the habit factor of students obtained a score of 48% in the low category. The study habits in question include the readiness of students before the lesson begins or in solving the problems given. Students who are ready to learn and work on questions will more easily grasp the material given by the teacher. Readiness needs to be considered in the learning process, because if students learn with proper preparation, their learning outcomes will be better [18]. Students' difficulties from habit indicators can be overcome by providing encouragement so that students are not lazy to take notes from the teacher, prepare textbooks, and be diligent in working on questions.

The results of the analysis of teachers show a percentage of 47% is in the low category. This shows that the teacher's factor is one of the factors causing students' difficulties in solving newton's law material problems of motion [22]. This means that the methods and learning strategies used by the teacher are not suitable enough to make students understand the material so that it makes students difficult to solve the problems given [23].

The results of the analysis of students' environmental factors showed a score of 40% in the low category. Environmental indicators that affect learning include student relationships with the surrounding environment. The results of the analysis show that the environment causes students to experience difficulties. These problems can be overcome by motivating students to always establish good relations between friends, teachers and the surrounding environment [24]. This is also related to the condition of students in learning. Crowded conditions will have a bad impact on students because the environment is very crowded so that the concentration of student learning will be disrupted.

The results of the factor analysis of the characteristics of the subject matter showed a score of 47% in the low category. This means that Newton's law of motion is material that makes it difficult for students to solve problems [25]. Factors derived from the inherent properties of physical matter are reflected in cumulative physical material. If you do not understand one concept, it will be difficult to understand the next concept. This is due to the interrelationship of one concept with another concept. This can be in the form of Newton's laws of motion material that has too many formulas to learn, requires good mathematical skills, must master the concept of vectors and the description of forces [20].

The results of the analysis of teacher learning strategies on Newton's law of motion are in the medium criteria with the percentage of each teacher being 60% and 59% being in the medium criteria. This means that the teacher learning methods and strategies that are applied are not sufficiently appropriate to be applied by the teacher. The physics teacher of State Senior High School 1 Ranah Batahan has not yet fully implemented a good learning strategy in teaching Newton's laws of motion. This is linear with the results of an open questionnaire, it was found that the teacher did not properly embed the important concepts in Newton's law material. The teacher only explains the basic concepts without explaining other important concepts. So because of this problem, it is difficult for students to answer the questions given.

This conclusion can be justified because it is linear with the results of the questionnaire on the difficulty factors of studentss in solving problemss with Newton's law of motion, where it can be seen that the teacher's factor is in the low category, which means that the teacher's factor is the cause of student difficulties, either because of the student's relationship with the teacher or of unfinished teacher teaching methods and strategies [26]. This conclusion is also linear with the observations observed in Newton's law learning are things whose material has not been completely conveyed by the teacher, for example, the case of the norm force is always the same as the gravity above, the example of the case of the inertia of objects, the case of the action reaction force and so on.

The teacher factor is also a factor that causess students' difficultiies in solving problems [27]. Teachers include factors that come from outside the students (external), namely from their abilities and teaching methods [28]The teacher's teaching method affects learning [18]. Poor teaching methods will affect the student's learning process, for example the teacher uses the lecture method which tends to be a one-way form of communication and only takes notes so that students become passive, sleepy and bored [29]. Conversely, if the teacher uses the right learning methods and strategies followed by the use of interesting learning media and careful preparation, the teacher will look professional as a result students will like the teacher and the subjects given [30]. Of course, this motivates students to be enthusiastic about learning and students can complete assignments and questions well without experiencing difficulties.

IV. CONCLUSION

Based on the result of the research and discussiion of the analysis of students' difficultiies in solving problemss on Newton's law material about motion in class XI MIPA at State Senior High School 1 Ranah Batahan, the following conclusions can be drawn: The tendency of difficulty of students in class XI Mathematics and Natural Sciences, State Senior High School 1 Ranah Batahan on Newton's law material about motion are in the high difficulty category. A total of 18 students from 27 students had difficulty in solving questions in the high category with a percentage of 67%. The factors that cause students' difficulties in solving problems with Newton's law of motion are: Factors that cause students' difficulties in solving problems with Newton's law of motion in terms of internal factors are health factors of 58%, interest factors of 48%, talent factors of 44%, the motivation factor is 46%, and the habit factor is 48%. This percentage figure shows that except for health factors, other factors are low in causing students' difficulties in solving problems. Factors causing students' difficulties in solving problems with Newton's law of motion in terms of external factors include the teacher factor with a score of 57%, environmental factors by 40%, and the characteristics of the subject matter by 48%. This percentage figure shows that these factors are low to be the cause of students' difficulties in solving problems. The teacher's learning strategy on Newton's law of motion at State Senior High School 1 Ranah Batahan is in the medium criteria.

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