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Influence of Interest In Learning and How to Learn on Understanding Concepts: Work and Energy Cases

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Abstract. Student who do not have an interest in lessons will find it difficult to achieve optimal success, and the way students learn also affects student learning outcomes. The research aims to determine the effect of interest in learning and how students learn in understanding student concepts. The type of research used is survey research. The research subjects were 60 students of class X Ar-Rohmah Islamic Boarding School Dau Malang. The research instrument was adapted and developed from previous research.The concept understanding instrument was adapted from the Energy Concept Assessment and Energy and Momentum Conceptual survey questions. Data processing using multiple regression analysis. The data analysis technique used multiple regression analysis. The data analysis results show that the value of F_{count} = 46,946 > F_{table} = 4.001, these results indicate that there is an influence on students' interest in learning with concept understanding. Obtained the results of testing how to learn and understanding the concept of F_{count} = 55.364 > F_{table} = 4.001, it can be concluded that there is an influence on student learning and conceptual understanding. Furthermore, the results of testing the effect of student interest in learning and learning methods on concept understanding were obtained F_{count} = 40.153 > F_{table} = 3.150, so that there was an effect of interest in learning and learning methods on understanding the concept of business and energy theory.
Keywords: Interest to learning; how to learning; conceptual understanding

Introduction

Students cannot focus on physics class, because students consider that physics is difficult. Teachers teach using lecture methods while students record in notebooks (Hidayat & Widjajanti, 2018). Often students find it difficult to understand the theory described by the teacher (Hofer, et al., 2017). The learning media used in the classroom are generally less attractive to students in learning. Students are less involved in discussing the theory, but only memorizing formulas, and working on problems in books (Docktor, et al., 2012). Educators should focus on students, so that students are active in learning (Cheng & Ding, 2020). So that new learning is needed that can improve students' conceptual understanding. Effort to choose the right learning strategy will determine a good understanding of the concept (Donuata, et al., 2019). Usually, each student has a different concept with expert knowledge (Docktor & Mestre, 2014). Effective learning can optimize students' understanding (Anggrayni and Ermawati, 2019). But there are some materials students have difficulties, with of which is work and energy (Anggrayni & Ermawati, 2019).

Problems solving physics requires conceptual understanding. Many studies reveal that students still have difficulty mastering concepts and problems solving physics in the concept of work and energy (Demirci et al., 2015; Lindsey et al., 2009; Maison et al., 2019; Rahmawati, 2019; Sabo, et al., 2016; Van Heuvelen & Zou, 2001). The concept of effort and energy even though it is used in students' daily lives still has difficulties (Herrmann-Abell & DeBoer, 2018). It is important for students to have a good understanding of the concepts of work and energy.

Students have difficulty when analyzing relationships between energy and force (Sabo, et al., 2016) and work on non-conservative force (Maison, et al., 2019). Other than, the concept of energy that is abstract causes students to be more active in understanding it (Bezen, et al., 2016). Anyway there are several factors why students do not yet understand the concept. Students' lack of curiosity about information in learning cause to lazy in following the learning process (Oktalia, et al., 2017). This is a negative impact so that the student becomes less interested in learning (Donuata, et al., 2019).

Interest has a big influence on learning, students who have no interest in physics will find it difficult to perform optimally (Oktalia, et al., 2017). Interest is one strong factor in determining the success of a person (Hadiya, et al., 2015). Learning interest serves to encourage students to do something, students who have an interest in learning physics will try to understand the physics (Friantini & Winata, 2019). For what is learned to be understood, it is necessary to focus on focusing activities to increase students' learning interest (Rosalina & Junaidi, 2020). Learning activities can be done with students learning while doing or practicing in the environment to increase the interest in learning students (Budiwibowo, 2016). If students have low interest, this condition will hinder the achievement of learning goals, namely to achieve cognitive, affective and psychomotor changes in themselves (Friantini & Winata, 2019) Therefore, so that students can achieve successful mastery of concepts, they must strengthen their interest in learning them.

According to Hidayat and Djamilah (2018: 66) student interest in learning can be interpreted as a condition of students who can foster a sense of liking and can arouse self-enthusiasm in carrying out an activity that can be measured through liking, being interested, having attention and involvement in the learning process (Hidayat & Widjajanti, 2018). Then Sari & Esti (2015: 62) expressed interest in student learning is a sense of interest of students to learn where students will want to explore, as well as conduct resulting in a change in the students themselves (Sari & Harini, 2015).

Teachers must be able to awaken students' interest in achieving students' understanding of the physics (Oktalia, et al., 2017). Apart from interest should be considered what can encourage students to learn well. One of them is to note how students learn (Natakusuma & Hardati, 2017). How to learn the activities carried out in learning something, meaning the activities should be done in a certain learning situations, required a certain way anyway (Hidayat & Edidas, 2019). Many students fail or get good learning results not because they do not know how to learn effectively and most are just trying to memorize lessons. To achieve good results it is necessary to learn how to learn good and effective as well. The methods used will become habits, so that these habits will affect learning outcomes (Hidayat & Edidas, 2019).

Not all students get the most out of it, effective learning can develop a more scientific view and understanding concepts of physics (Sahin, 2010). How to learn effectively by making lesson schedules and their implementation, reading textbooks, taking notes, repeating lesson materials, and doing tasks (Natakusuma & Hardati, 2017). How to learn is inseparable from the activities of students in the teaching and learning process that will take effect the achievement cognitive competence, affective, and psychomotor (Prayogo & Aji, 2016).

Many research reveal that the interest in learning (Rosalina & Junaidi, 2020) and how students learn (Natakusuma & Hardati, 2017) influence students' learning outcomes. Therefore, to increase conceptual understanding required interest in learning and good how to learning. However, there are not many research reveals that interest in learning and how learning affects conceptual understanding. Based on the background previously described, this study aims to determine the effect of interest in learning, how to learn to improve understanding of the concept of business and energy theory.

Methods

This research is a type of survey research, to find out the influence of interest in learning physics, and how students learn to understand concept of students. The participants of this study were 60 students of class X Ar-Rohmah Islamic Boarding School Dau Malang in the academic 2019/2020 even semester. This study is designed to determine the level of relationship between different variables in a population which aims to determine how much influence the independent variable (X) has on the dependent variable (Y).

The data obtained during the study must meet the test of assumptions first before the analysis process. Then there are several assumptions or requirements that must be met in the regression model. Test assumptions that must be met is the normality test, linearity, multicollinearity test, heteroscedasticity test and autocorrelation test. If all the conditions are fulfilled then the assumption can be tested multiple regression. The hypothesis tested based on the comparison of the value of F_{count} with F_{table} are as follows:

1. If the value of $F_{count} > F_{table}$, then the hypothesis is accepted. This means that interest in learning (X1) and how to learn (X2) simultaneously affect students' conceptual understanding (Y) of work and energy theory.
2. If the value of $F_{count} < F_{table}$, then the hypothesis is rejected. This means that interest in learning (X1) and how to learn (X2) simultaneously have no effect on students' conceptual understanding (Y) of work and energy.

The hypotheses tested based on the comparison of significance values (Sig.) Are as follows:

1. If the value is Sig. < 0.05, then the hypothesis is accepted. This means that interest in learning (X1) and how to learn (X2) simultaneously affect students' conceptual understanding (Y) of work and energy theory.
2. If the Sig. > 0.05, then the hypothesis is rejected. This means that interest in learning (X1) and how to learn (X2) simultaneously have no effect on students' conceptual understanding (Y) of work and energy.

This research instrument is a questionnaire of students' learning interests and ways of learning adapted and developed from previous research instruments (Ra'is, 2014). Instruments are presented in the form of questionnaire leaflets consisting of 29 question points, with 2 Indicators in Table 1 on Learning Interests Student and 3 Indicators in Table 2 on How to Learn Students.

Table 1. Indicators of Research Instruments Interest Learning of Student

Indicator	Sub Indicator	Number of Statement Items
Interederd, happy, and eager to learn	Interested in subject matter	1, 2, 3, 4, 5, 6, 7, 8
	Always eager to follow learning process	
	Feel happy about getting school assignments	
	Feeling sad if you don't take part in classroom learning	
	Disappointed if teacher is not present	
Learning activities	Always happy to take exam to find out how high ability to dominate the subject matter	9,10,11,12,13,14,15
	Feel at home learning in classroom during learning process	
	Always try to understand lessons learned during learning activities	
	Always ask teacher if they find it difficult to understand	
	Likes to do individual tasks without cheating	

Table 2. Indicators of Research Instruments how to Learn Students

Indicator	Sub Indicator	Number of State-ment Items
How to take lesson	Learning before learning process begining	1
	Attendance of concentration, learning notes, and participation in learning	2,3,4,5,6
Making Schedule and notes	Record lesson schedules	7,8
	Create a study schedule	9
	Methods used in creating notes	10,11
	Reread the material you have learned	12
Doing Task	Doing group or independent assignments	13,14

Students were asked to answer each survey statement by selecting five categories: strongly agree, agree, disagree, disagree, and strongly disagree. The statement consists of 29 positive statements. Quesstionnaire score is based on Table 3.

Table 3. Score Range of Instrument for each Question Item

Options	Score Every Statement
Strongly Agree	5
Agree	4
Less Agree	3
Disagree	2
Strongly Disagree	1

Data descriptions were carried out by descriptive analysis. The data obtained from the questionnaire was collected and analyzed by calculating the amount of interest learning and how each student learned. The data obtained was analyzed using SPSS, with a review of two independent variables, namely the interest learning and how to learn against one dependent variable namely understanding concepts.

Problem understanding concept of work and energy case is an adaptation of ECA (*energy concept assessment)* and EMCS (*energy and momentum conceptual survey)* using a multiple choice with 5 points. The description of per question item used in this study is presented in Table 4:

Table 4. Description of Questions per Item

Concepts	Item Number	Problem Description
Work	1	Image of a worker being inside an elevator and moving at a fixed speed to the top two floors, student is asked to answer how much work on the workers by gravity of Earth.
	2	Students are asked an work by Earth's gravity to throw ball and return to positin beginning
	3	Students are asked to choose how to move the suitcase as the determining factor of work by earth's gravitational force.
	5	Ridwan's image pushed the wall with all its might, students are asked to choose a statement that matched the picture that occurred.
Energy	4	Students were asked to observe two runners heading east at speed v.

The students' answers were analyzed and combined with the grades taken by the teacher during work and energy lesson. Data obtained from questionnaires and concept understanding questions were analyzed with *multiple regression* tests on SPSS with a significance level of 0.05, with two independent variables

Results and Discussion

Learning on work and energy theory requires an interest in learning and how to learn to be right in order to get maximum learning results. How to learn to be right will determine understanding of theory in student. Students must improve how to learn in order to understand concept students more deeply. In addition to how students learn, interest learning physics subjects is also very important. Students who have a high interest learning will encourage students to deepen their understanding of work and energy case.

In this study all assumptions have been fulfilled. The interest learning questionnaire and student learning methods have been tested, the questionnaire items are said to be valid and reliable. The distribution of interest in learning questionnaires and learning methods was given to 60 students of grade X even semester.

Research data obtained from the questionnaire of students' interests learning and how students learn. Analysis data using *multiple regression analysis* showed *the* influence of students' interest learning on understanding concept. Result of the analysis can be seen in Table 5.

Table 5. Results of Student Interest, Student Learning Methods and Concept Understanding Tests

Variable	Score		
	Value	Interests Learning	How to Learn
Student's Total	60	60	60
Standar Deviation	7.01884	9.76068	7.85022
Minimum Score	55	49	54
Maximum Score	90	90	91
Average	73.5833	70.8167	76.0333

The results obtained from Table 5 can be seen that the variable value conceptual understanding with an average value of 73.5833, standard deviation 7.01884 with a maximum value of 90 and a minimum of 55. In interest in learning an average value 70.8167, standard deviation 9.76068 with a maximum value of 90 and a minimum of 49. Meanwhile, how to learning obtained an average value of 76.0333, a standard deviation of 7.85022, a maximum value of 91 and a minimum value of 54. It can be concluded that the interest in learning and student learning methods is very high. on understanding the concept of business and energy materials. This means that interest in learning and learning styles greatly affect students' understanding of concepts. As stated by (Slameto,

2010) success in learning is influenced by interest in learning and student learning, because interest in learning and how to learn are external factors to encourage students to improve understanding of concepts.

Furthermore, to determine whether there is an influence between student interest and concept understanding, a hypothesis test was carried out using multiple regression analysis, the results obtained for interest in learning and concept understanding can be seen in Table 6.

Table 6. Influence of Student Interest Learning on Understanding Concept

Model	Sum of Squares	df	Mean Square	F	Significance
Regres-sion	1300.211	1	1300.211	46.946	0.000[b]
Residual	1606.375	58	27.696		
Total	2906.583	59			

Results of study obtained in Table 6 showed the results of students' interests learning and understanding concepts of students' on work and energy materials. Based on the results of the analysis, it was obtained that F_{count} = 46.946 with a sig. Value = 0.000. The data from the analysis showed that the F_{count} value was 46.946 and the F_{table} value was 4.001. Value of $F_{count} > F_{table}$, it can be concluded that there is an effect of student interest in student understanding of concepts. This is also the same as the significance value of 0.000 less than 0.05, meaning that interest in learning affects students' conceptual understanding. Usually students' interest in learning is shown from the daily learning activities of students in class, whether the student is enthusiastic in class, problems solving if given physics problems, listening if they are explained. Of course, students are interested in something and when they have difficulty in studying, they will take efforts until the problem is resolved.

In addition to analyzing student interest, researchers also analyzed student learning methods obtained from an instrument in the form of a checklist on a Likert scale, the data were analyzed using descriptive statistics and multiple regression. The results of study to knowing influence of how to learn students' on understanding concepts on work and energy are shown in table 7.

Tabel 7. Influence of How to learn Student on Understanding Concept

Model	Sum of Squares	df	Mean Square	F	Significance
Regres-sion	1419.505	1	1419.505	55.364	0.000[b]
Residual	1487.078	58	25.639		
Total	2906.583	59			

The data obtained from the analysis obtained F_{count} = 55.364 with a sig. = 0.000. This shows that the F_{count} value obtained is 55.364 and the F_{table} value is 4.001. Value of $F_{count} > F_{table}$, so there is an effect of student learning on students' understanding of concepts. This is also the same as the significance value, which is equal to 0.000 which is less than 0.05, so that the way students learn affects students' conceptual understanding. Based on the data obtained, it is necessary to determine the effect of interest in learning and learning methods on students' conceptual understanding of the work and energy materials shown in Table 8.

Table 8. Influence of Student Interest Learning and How to Learn on Understanding Concept

Model	Sum of Squares	df	Mean Square	F	Significance
Regression	1699.974	2	849.987	40.153	0.000[b]
Residual	1206.610	57	21.169		
Total	2906.583	59			

The influence of interest learning and how to learn students on the understanding concepts is shown in F table. Obtained data analysis results, namely the value of F table shows 40.153 which is F_{count} while F_{table} value is 3.150. The value of $F_{count} > F_{table}$ so that the interest in learning and the way students learn simultaneously affects students' conceptual understanding. Seen from the significance value of 0.000, which is less than 0.05, it is significant. This means that interest in learning and how to learn simultaneously affects students' conceptual understanding of work and energy.

The main purpose of research was to find out influence of interest learning and how student learn on understanding concepts on work and energy. This research uses survey form instruments, questionnaires of interests learning and how students learn adapted from thesis questionnaires that have been tested for validity and reliability. The understanding concept instrument is adapted from the ECA and EMCS using a multiple choice of 5 points.

Based on the results of data analysis in this research, it shows that there is an effect of student interest in student understanding concepts. This means that students who have high interest will get a maximum understanding of the concept of work and energy materials. Conversely, if students have less interest in classroom learning, then they are less in understanding concept of work and energy. The results of the study are in accordance with previous research which shows that good interest will affect student learning outcomes, meaning that the better student interest in learning, the better understanding of student concepts (Budiwibowo, 2016; Hamdi & Rahim, 2020; Oktalia, et al., 2017).

Similarly, research (Milta & Budhi, 2016) states that interest learning and learning achievement of physics has a significant positive relationship. Research conducted (Rais, 2019) also states that understanding of the concept is very much influenced by interest in learning, if the teaching material being studied is not interesting, then students do not learn optimally. On the other hand, if the teaching material is very interesting, students will be reluctant to learn optimally. Students will need interest when learning, students who do not have an interest in a lesson will find it difficult to achieve conceptual understanding. Students' understanding of concepts increases due to student interest in learn-

ing the material (Budiwibowo, 2016), so that interesting learning will be easier for students to learn. In addition, in learning the teacher must look at the condition of students because the condition of students is also very important. Students who have a higher interest will pay more attention and curiosity to learning (Sirait, 2016). When students begin to have an interest in physics, even though students have difficulty in learning they will not give up solving the problem (Silfitrah & Mailili, 2020).

The right way of learning will determine maximum learning outcomes. Students need to know how to learn that is right for themselves in order to get maximum learning results. The discussion of the influence of student learning on students' conceptual understanding of work and energy materials shows that there is an influence of student learning on conceptual understanding. This shows that the way students learn affects conceptual understanding, the effect of this student learning method shows that the more precise and orderly the students' learning methods are done, the better and improved the conceptual understanding that will be obtained. Likewise, if the students' learning methods are not regular and not precise, the conceptual understanding they get is not optimal. This finding is in accordance with research (Natakusuma & Hardati, 2017) which states that there is a positive influence on student learning on learning outcomes, proper and regular learning will affect students' understanding of physics. If students have an irregular and less permanent way of learning, then the students' understanding of physics is not optimal. The research by also explains that learning methods greatly contribute to learning outcomes, because the more positive the learning methods students have in the learning process, the better the students' understanding of concepts (Hidayat & Edidas, 2019).

Based on the results of data analysis, in general there is an effect of student interest in learning and student learning on student understanding of concepts. This shows that the two variables do have an influence on conceptual understanding of work and energy theory. It is suggested that further research can reveal other factors that influence students' conceptual understanding. These factors can help the learning process run more smoothly. Apart from interest in learning and how to learn, there are other factors that can improve students' understanding of concepts. Such as motivation or environmental factors (Milta & Budhi, 2016). The extrinsic motivation factor is in the form of the teacher's ability, where the teacher should be able to motivate students to achieve optimal understanding of the concept of business and energy materials (Baharuddin & Ahmad, 2017). Intrinsic motivation is a factor that affects student achievement. This is due to the intrinsic motivation, willingness and desire from within students to learn, which will be important to encourage students to improve their learning achievement (Oktalia, et al., 2017). There are also factors about student confidence in expressing opinions and understanding the concept of the material (Rafli, et al., 2018).

Conclusion

Based on the results of the research and discussion, it can be concluded that interest in learning and how to learn affects the conceptual understanding of work and energy theory. The higher the student's interest in learning, the better the conceptual understanding of student's. Conversely, if students do not have an interest in learning, the students' conceptual understanding is not optimal. Students' learning methods also need to be considered because they can affect students' understanding of concepts on energy and energy. In this finding, students should also pay attention to their interest in learning and how to learn because there are many studies that state that interest in learning and how to learn greatly affects learning outcomes. These findings are recommended to teachers and further researchers to use effective learning to optimize students' conceptual understanding.

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