

Analysis Of Students' Concept Understanding About Newton's Law

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Abstract: This study aims to determine students' understanding of concepts related to Newton's law; this study uses a qualitative descriptive approach. Respondents in this study amounted to 10 students in grade 8 at MTsN 6 Tulungagung. Reasoned multiple choice tests and interviews collected data. From the research, it can conclude that the understanding of the student concept of Newton's law is still low. While the interview data that has done can see that students know various examples of phenomena related to Newton's law from the experience of daily life, but less able to connect with the concept of Newton's law.

Keywords: Students' concept, Newton's law.

1. Introduction

One important concept that needs to study in physics is Newton's law. There is a wrong conception of students when discussing the forces acting on parabolic motion (projectile motion systems), Students draw velocity vectors, not force vectors (Students draw velocity vectors, not force vectors) [1] preconceptions or initial concepts obtained by students in the assimilation process obtained. During the assimilation process, students try to improve their environment using existing cognitive structures without making changes. Through the accommodation process, students try to arrange a new cognitive structure based on received stimuli [12] During the assimilation process, asking to discuss a very large misconception. Karen, in this process, students build their concepts based on out-of-experience outside expert guidance. This process arises from students' initial knowledge, which is the basis of subsequent knowledge. Because each concept does not stand alone, but each concept connected with other concepts. So each concept can be connected with many other concepts and only has meant about other concepts. All concepts together form a kind of knowledge network in the human mind. Moreover, according to the viewpoint of constructivism philosophy that argues that knowledge is the construction of students, it can occur, even though given the same material or lesson, students can build knowledge that is different from what is expected by the teacher so that misconception occurs. Further research is needed to find out students' conceptions of Newton's law. By knowing an accurate description of students' conceptions, the teacher will find it easier to choose the appropriate method, thus improving learning outcomes. Understanding the concept is very important in the process of gaining knowledge. The concept of students and their cognitive processes influence what they see (The concepts of students and their influence processes what he or she sees) [4]. Understanding students' concepts are very important because if something goes wrong, it can cause a wrong conception. Students can experience the different conceptions that occur they confronted with a source of incoherent presentations. Based on the explanation above, it

can conclude that students' conceptions of Newton's law are very important. Given that this is very important, and conception ultimately depends on the information provided by experience (and conceptions ultimately depend on the information provided by experience) [5]. There are five reasons why students find it difficult to understand science concepts, namely (1) abstract concepts, (2) complex systems, (3) very limited initial experiences / knowledge of students, and (4) lack of understanding of symbols, which causes misconceptions occur in students (5) misconceptions that occur in students [6]. The concept of learning refers to a constructivist view, that understanding about construction becomes more important than memorizing facts (that understanding is more important than memorizing fact) [7]. Physics learning must change from memorizing to focusing more on understanding concepts. When you submit your paper print it in two-column format, including figures and tables [1]. In addition, designate one author as the "corresponding author". This is the author to whom proofs of the paper will be sent. Proofs are sent to the corresponding author only [2].

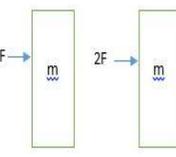
2. Method

This research is qualitative research with data consisting of facts, so that in this study used for qualitative descriptive. In this study, ten people responded. The respondents gave tests of Newton's legal concept descriptions. Data collected by giving reasoned multiple choice tests, interviews, and three FCI (Force Concept Inventory) questions [8].

3. Result and Discussion

From the data obtained shows that many students can correctly answer all questions related to Newton's laws, but there are still many who have difficulty in connecting between problems related to Newton's law and concepts related to Newton's laws. The results of the research conducted are as follows.

Table 1. analyzes student answers and concepts

N O	QUESTION	ANSWER				N O	QUESTION	ANSWER			
		RIG HT	FAL SE	REASON				RIG HT	FAL SE	REASON	
				RIG HT	FAL SE					RIG HT	FAL SE
1	 <p>When someone is in the car and the car is braked suddenly. What will happen to that person is</p> <p>a. The person will be pushed forward b. The person will be pushed back c. Pushed to the right and left sided d. Nothing happened</p> <p>..... (give reasons for your answer)</p>	100%	0%	26,67 %	73,33 %	3	 <p>Two carts have different masses, then both are driven in style the same so that it moves ...</p> <p>a. Both will move with the same acceleration b. Both will move with different accelerations c. Both will move with the same acceleration and then after a certain time, the acceleration is the same. d. Both will move with the same acceleration and then after a certain time the acceleration will be different</p> <p>(give reasons for your answer)</p>	100%	0%	53,33 %	46,67 %
2	 <p>A magician suddenly pulls a tablecloth on which there is a glass, what will happen to the glass is</p> <p>a. The glass will follow the tread and fall b. The glass will move in the opposite direction with the tablecloth c. The glass will remain in its position</p>	73,33 %	20%	6,67 %	93,33 %	4	 <p>Aldo and Aldi are pushing the beam, Aldo pushes the table with an F style, while Aldi pushes it with a 2F style. in the same time interval and the same distance</p>	93,33 %	6,67 %	40%	60%

NO	QUESTION	ANSWER			
		RIG HT	FAL SE	REASON	
				RIG HT	FAL SE
	then a. Aldo will arrive first b. Aldi will arrive first c. Aldo will start first then Aldi follows d. Aldi will start first and Aldo will follow (give reasons for your answer)				
5	 A student is experimenting by pushing the wall using roller skates, so the student will a. The student will be pushed forward b. The student will be pushed back c. The wall will be pushed d. Nothing happened (give the reason for your answer)	80%	20%	13.33 %	86.67 %
	Average	89%	9%	28%	60%

Student: I had experienced when I went to school
 Lecturer: what caused this to happen?
 Student: I don't know sir
 Lecturer: then what is the effect of the push force on the acceleration that arises on an object?
 Student: great style will make things move faster
 Lecturer: Have you ever hit a wall?
 Student: ever
 Lecturer: what happened?
 Students: the parts hit hard
 Lecturer: why did it happen?
 Student: because the wall is hard, sir

From the results of the interview, known that the causes of the number of students who can answer questions related to Newton's law correctly, but only a few can connect it with Newton's law in concept. Because the phenomenon used is indeed related to the experience of students in everyday life, but they are less able to connect it with concepts from Newton's law, here are some answers from students from the student's answer, the student's answer is correct, but the reason for the student's answer is a repetition of the question asked, this occurs because students already know the answer to the question based on daily experience, but are unable to find the relationship between the phenomenon and Newton's law. Even in the second question about the law to Newton II, a student gave the reason that the cause of the glass above the tablecloth that pulls suddenly did not fall because the one who did it was a reliable magician. Where this is not relevant if it is associated with Newton's law. Based on the answers of these students began to associate the experiences encountered with the existing concepts. Students have been able to make connections between the influence of the masses on acceleration. Based on student answers can be outlined that mastery of student concepts about Newton's legal concepts is still relatively lacking, where it can see from the percentage of students who can provide the right reasons for the answers given which is still low at 28%, students 60% incorrect answer. This reinforces from the results of interviews with several students about how to understand their concepts, and from the answers given by students they tend not to understand the concept of Newton's law well, while the causes of students being able to answer correctly are caused by the phenomena that are asked by students in everyday life.

4. Conclusion

From the data obtained on average than 89% of students' answers are correct and 9% of students' answers are wrong, while the reason for student answers 28% is correct, but 60% of students give the wrong reasons. From these data, there is an interesting fact that 89% of students' answers are correct, but 60% of the reasons for student answers are still wrong, as for the answers - the student's answers are as follows interesting to be explored further so that interviews results obtained as follows:

Details of the interview sample with students answer shown in (Figure 1) as follows:

Lecturer: what happens to passengers when the vehicle brokes suddenly ?.

Students: passengers pushed forward
 Lecturer: where did you know that this would happen?

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