https://dx.doi.org/10.22161/ijaers.6.5.60 ISSN: 2349-6495(P) | 2456-1908(O)

The Impact of Interactive Physics Animate Media to Concept understanding of High School Students

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Abstract**—** *The purphose of this research is to know the impact of Interactive physics animate media to concept understanding of high school students. The impact of media can be shown by difference of concept understanding indicator before and after learning physics with Interactive Physics animate media. The design of this research is one group pre-test and post-test. The subject of this research are 75 students class XI senior high school. The technique to get data in this research is test before and after learning physics with Interactive physics animate media. The data analyze in this research is using IBM SPSS 20 with paired sample t-test. The result of this research shows that p-value < 0,05 wich mean that the concept understanding of students is increased after using Interactive Physics animate media.*

Keywords**— Physics Animate Media, IBM SPSS 20.**

I. INTRODUCTION

Learning in 21th century must develope a vision of education using technology that make impact to concept understanding (Aderson & Krathwohl, 2001). One of contribution to developing a vision in learning is developing physics learning for students (Sanders, 2007), because physics is one of science that studies and analyzes the symptoms or processes of nature and the nature of substances and their application (Giancoli, 2014). Developing physics learning is an important thing in this global era, because by learning physics student can explore their skills to face complexity problem (Dircknick and Holmfeld, 2009). But a lot of students think that physics is more hard then the other lesson. That because physics contains some of abstract concept (Omek, et al., 2008). According to result of begining observation to some high school in Jember, that student use text book to learning physics concept. According to Halim et al (2012), student more hard to study a science concept because a lot of material content should be memorize. Whereas, physic is a lesson that have a lot of abstract concept and it can't be understand if the student only memorize the material content. For that, we need to develop an innovative physics learning. Innovative learning can make students esier to finishing problem and understanding of physics concept (Hmelo and Ferrari, 2016; Heong, et al., 2011).

Concept understanding is a part of cognitive skill, this skill make some one understand the content on some learning matery (Darvies in Dimyati & Mudjiono, 2009). Students can be said understand a concept if they can explain the concept correctly. Concept understanding devided to be three part namely translation understanding, interpretation understanding, extrapolation understanding (Sudjana, 2012). The student will have all of concept undertanding if they can learning with good media (Wicaksono, 2017). According to the result of interview by the researcher to some high school in Jember, students prefer learning physics with media and animation because difficult content become esier and more interesting. For that, we need to use a kind of animated interactive media.

Interactive media is one of kind media that the user can be free to use the media (Suhandi, et al., 2009). According to (Gunawan, et al., 2015), interactive media can make student more active physics learning. Learning with interactive media more meaningfull, because the student can explore their skills to solve a problem (Saregar, et al., 2013). One of interactive media that can make student more attractive is animated media. So the researcher do this research to know the impact of interactive physics animate media to concept understanding of senior high school.

II. METHODOLOGY

The type of this research is quasi experimental research The purphose of this research is to analyse the impact of interactive phisycs animate media to concept understanding of high school students. It was using one group pre-test and post-test design. The early researh had done with observation about student media and interview with 30 student from 3 of 10 high school in Jember district The interview has given with some qustion about requirement of media in physics learning.

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The impact module of interactive phisycs animate media to concept understanding is shown by the existence of significant (statistically) increment scores of all concept understanding categories between the pre-test and the post-test. The test was using one groups of students at science study program in islamic senior high school academic year 2018/2019. There are 32 students in these group. Every students have pre test before learning phisycs concept, after that students learning with interactive phisycs animate media, and than students have post test.

The score of pre test and post test were analyzed with the paired t test or non parametric analyze Wilcoxon test. The testing methode was selecting depend on the fulfilment of the nomality assumtion for pre test and post test scores. Otherwise, the non-parametric analysis will be used. The analysis was performed using the IBM SPSS Statistics 20 software.

III. RESULT

The The result of this research are presented in Figure 1, Table 1, and Table 2. The Figure 1 is result of score pre-test and post-test for all categories concept understanding. The orange bar is representing the pre-test and the shaded bar for the post-test. Table 1 and Table 2 are representing the existence of significant (statistically) increment scores between the pre-test and the post-test of Translation, Interpretation, and Extrapolation understanding.

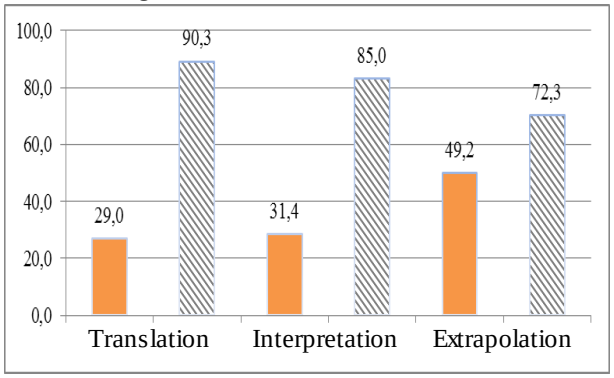

Fig.1: The score of the students' concept understanding before and after learning with interactive phisycs animate media.

Table 1. The result of normality test for concept understanding of students

	Translation		Interpretation		Extrapolation	
	Pre-test 1	Post-test 1	Pre-test 2	Post-test 2	Pre-test 3	Post-test 3
N	36	36	36	36	36	36
Paired Sample Test Sig. (2-tailed)	0.00001		0.00001		0.00001	

Table.2. The result of paired t-test for concept understanding of students.

	Translation		Interpretation		Extrapolation	
	Pre-test 1	Post-test 1	Pre-test 2	Post-test 2	Pre-test 3	Post-test 3
Asymp. Sig. (2-tailed)	0.326	0.072	0.061	0.071	0.128	0.231

Figure 1 represents that the score in the pre-test and the post-test in all of categories of student's concept understanding in using of interactive phisycs animate media is increasing. The score of the pre-test and the post-test for the translation understandings category respective are 29.00 and 90,3; The score of the pre-test and the post-test for the interpretation understandings category respective are 31,4 and 85; The score of the pre-test and the post-test for the extrapolation understandings category respective are 49.2 and 72.3. The result show that all student's concept understanding are increasing,. The summary of the paired t-test after the fulfilment of the normality assumptions for all pre-test and post-test is shown in Table 1 and Table 2. For that, we used a paired t-test statistical measurement.

IV. DISCUSSION

Acording to the Figure 1, we can see that before learning with interactive phisycs animate media was done, the mean scores of student's concept understanding are low. The mean scores of student's concept understanding after using interactive phisycs animate media can be categorized as high acording Hake (Jatmiko, 2016). The result of the research were suported by Gunawan., et al (2015) and Saregar ., et al (2013) that student's concept understanding skill was increase after using Interacive multimedia. The most high increament on the Figure 1 is translation understanding and the most low increament is extrapolation understanding. Acording to Bloom it cause translation understanding is only change variables and extrapolation understanding is predict a problem, so extrapolating is more dificult to understand for student (Sudjana, 2012).

https://dx.doi.org/10.22161/ijaers.6.5.60 *ISSN: 2349-6495(P) | 2456-1908(O)*

Acording to the Table 1, we can see that the score of asym significant > 0.05, it mean that scores pre-test and post-test in all categories of student's concept understanding was normal, so we choose paired sample t-test for the the statistically test. The scores of paired sample test in all categories of student's concept understanding < 0.05. It mean that there is impact of interactive phisycs animate media on physics concept understanding. That happen because student learn with interactive phisycs animate media in physics. This arguement was suported by result of study by Wicaksono, et al., (2011) and Suhandi, et al., (2009) that concept understanding of student become increa after using interactif media in learning. The increament of students concept understanding is because of using animate media in learning, so student have motivation and esier to understand physics concept. This statement suport by Anggraeni (2013), coca, et al., (2013), and Hopson (2014) that using technology and animate media is make learning more active and students achievement increas. Similiarly with Cui, et al., (2017); Harianto, et al., (2017); Sharif, Wills, & Sargent, (2010) that students achievement increas in term using visual media in learning..

V. CONCLUSION

Based on research above, the student's concept understanding after using interactive phisycs animate media had significant increament. So, it can be concluded that there is impact interactive phisycs animate media on student's concept understanding.

ACKNOWLEDGEMENTS

The Author would like to thank everyone involved this research and to the faculty of Teacher Training and Education of Jember University wich had provided support this jornal.

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