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RESEARCH ARTICLE

THE IMPACT MODULE OF DINAMICS BASE PROCESS IMAGE ON CONCEPT UNDERSTANDING OF STUDENTS.

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Abstract

Process image is defined as a series of images of objects, events or phenomena, which the images of one and another are relatively different in terms of circumtances, position, shape, or their combinations, as a whole describes a coherently phase and a unified whole. The aim of this research is to analyse the impact of module dynamics base process image on the student's concept understanding in senior high school. The impact of the module is shown by difference of student's concept understanding before and after learning with module dynamics base process image. This research is a quasi experiment by using one group pre-test and post test-design. The subject of this research is students class X senior high school. The technique of data collect in this research is test before and after learning with module of dynamics base process image. The analyze of data in this research is paired sample t-test with IBM SPSS 20. The result shows that student's concept understanding is increas after using module dynamics base process image.

Introduction:-

The 21st century learning brought a popular change in educational development that led to a change of learning paradigm with marked curriculum changes, so that difficult concepts became more easily understood. The goal of 21st century learning is to encourage students to have the skills to become learners and to be able to solve various problems (Park, et al., 2006). Skills as learners is very appropriate with the characteristics of physics learning and closely related to the scientific approach. Physics is one of the lessons that has contributed greatly in the development of science and technology and is widely used in everyday life (Sanders, 2007). However, physics learning in the classroom is still experiencing some problems, students need a good media to understand the concept of physics with more active (Coca, et al., 2013). For that, we need a learning media that makes students understand the concept, so that the quality of learning in the class to be better.

Physics is one of science that studies and analyzes the symptoms or processes of nature and the nature of substances and their application (Wospakrik, 1994: 1). One of the main subjects in physics is the dynamics (Giancoli, 2014). The dynamics is one of concept in physics that can be understood by seeing a direct incident. In general, students work out the problems of dynamics with start by using the formula. Though physics is a science that begins with how to analyze the symptoms or natural processes. This often happens because students do not understand the concept of physics so that students view physics as a difficult lesson (Omek, et al., 2008). Based on research of

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Jatmiko, et al., (2016) and Wicaksono, et al., (2017) students more easily understand the concept with the existence of learning media. According to Nagpal, et al., (2013) understanding of student's concept will be more meaningful if the concept of learning is controlled independently. For that, we need a learning media that can help students to understand the concept of dynamics by looking at the incident directly or the model of direct incident with independently.

Module is one media that can make students able to work independently to analyze the dynamics (Rufii, 2015). In addition, students prefer to study physics by using modules (Syahroni, 2016). A good module should be accomodate to the character of the material and students to make it easier to understand. Currently, there are more general physics modules in many high schools that focus more on problem exercises than explaining the physics concept, whereas students prefer and easily understand the concept of physics when accompanied by an explanation of images (Good, et al., 2010). So, to understand the concept of dynamics, required modules in which there are images that can make students more easily analyze incident related to the dynamics. One type of image that good in representing an incident related to the concept of dynamics and is suitable for high school students is process image.

According to Sutarto, the process image is a series of object modeling image, events or phenomena, which between the images of one another are relatively different in terms of circumstances, position, form, and combinations which as a whole describe a coherent stage and constitute a unified whole (Harianto, 2017). Student will be easier to analyze an incident more detail because in the process image there are different stages of an incident. In addition, the use of process image in learning can make students more interested and bring the creativity of students to understand a more difficult concept (Yusmar, 2017).

Concept understanding is one of cognitive skill to understand the content on some learning matery (Darvies in Dimyati & Mudjiono, 2009). According to Bloom, the students understand a concept if they can explain the concept correctly. There are three category of concept understanding namely translation understanding, interpretation understanding, extrapolation understanding (Sudjana, 2012). The student will have the three categories of concept undertanding if they can learning with good media. For that, we need the use of module base proses image to determine the impact module of dynamics base process image on concept understanding of students.

Research Method:-

The focus of this research is to analyse the impact modul of dynamics base procces image on concept understanding of students. The impact modul of dynamics base procces image is shown by the existence of significant (statistically) increment scores of all concept understanding categories between the pre-test and the post-test. This research was coducted using one groups of students at science study program in senior high school academic year 2017/2018. These group consisted of 36 students.

This research can be classified as quasi experimental research. It was using the one group pre-test and post-test design. The analyze of the impact of modul of dynamics base on procces image on student's concept understanding, the score pre-test and post-test were analysed using the paired t-test or non parametric analysis Wilcoxon test. The selection of the testing methods depended on the fulfilment of the normality assumption for both pre-test and post-test scores. When the normality assumption for the scores are achieved, then the paired t-test will be applied. Otherwise, the non-parametric analysis will be used. The analysis was performed using the IBM SPSS Statistics 20 software.

Findings and Discussion:-

The mean of pre-test and post-test mean of all categories concept understanding are presented in Figure 1. The red bar representing the pre-test and the shaded bar the post-test. The existence of significant (statistically) increment scores between the pre-test and the post-test are presented in Table 1 and Table 2.

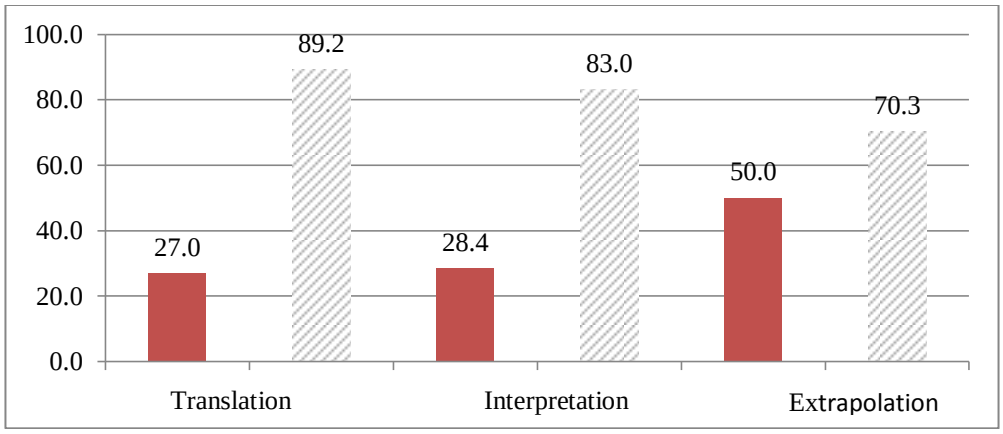

Figure 1:-The mean of student's pre-test and post test in terms of the concept understanding in using module of dynamics base process image.

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**
Asymp. Sig. (2-tailed)	0.319	0.074	0.058	0.072	0.126	0.209

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**
N	36	36	36	36	36	36
Paired Sample Test Sig. (2-tailed)	0.0001		0.0001		0.0001	

Figure 1 shows that the mean score between the pre-test and the post-test in terms all of categories of student's concept understanding in using modul dinamics base process image is increasing. The average of the pre-test and the post-test scores for the category of translation understanding are 27.00 and 89.22, respectively; the average of the pre-test and the post-test scores for the category of interpretation understanding are 28.42 and 83.03, respectively; while the average of the pre-test and the post-test scores for the category of extrapolation understanding are 50.03 and 89.22, respectively. For analysing the impact modul dynamics base process image on student's concept understanding, we used a paired t-test statistical measurement. 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.

Discussion:-

Based on the Figure 1, it can be seen that before the learning process was done, the student's concept understanding are low. The mean scores all categories of student's concept understanding after using modul of dynamics base process image can be categorized as high acording Hake (Jatmiko, 2016). The result of the research were suported by Rufii (2015) that student's achievment was increase after using module. The most increase category of student's concept understanding is translation. Acording to Bloom it means that students can changes problem into symbol correctly (Sudjana, 2012).

Based on the Table 1, it can be seen that scores pre-test and post-test in all categories of student's concept understanding was normal because score of asym significant > 0.05, so the paired sample t-test is chosen. The scores of paired sample test in all categories of student's concept understanding < 0.05. It mean that there is impact of module based on process image againts student's dynamical motion concept understanding. That happen because student had motivation to develope their concept understanding about with module of dynamics base process image. This theory was suported by result of study by Harianto (2017) and Yusmar (2017) that module base process image give motivation in student's learning. Similiarly, students achievement increas in term using visual media in learning (Cui, et al., 2017; Sharif, Wills, & Sargent, 2010).

Conclusion:-

Based on the result and discussion of research above, there is significant increament of student's concept understanding after using module of dynamics base process image. So, it can be concluded that there is impact module of dynamics base process image student's concept understanding.

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