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**PE - 02**

**IMPROVING THE RESULT OF PHYSICS STUDY OF THE STUDENTS ON  
PARTICLE DYNAMICS TOPIC BY USING CONTEXTUAL TEACHING AND  
LEARNING**

Classroom Action Research at class X Science 2 at Public High School (SMAN 68) Jakarta-  
Indonesia.

**Anida Nurafifah<sup>1</sup>, Slamet Siswoyo<sup>2</sup>, Vina Serevina<sup>3</sup>**

<sup>1</sup>University Student of Phsics Department (FMIPA) State University of Jakarta, <sup>2</sup>Teacher of SMAN 68 Jakarta, <sup>3</sup>Lecturer of Phsics Department (FMIPA). State University of Jakarta, 2013  
[anidanurafifah@yahoo.com](mailto:anidanurafifah@yahoo.com), [vina\\_serevina77@yahoo.com](mailto:vina_serevina77@yahoo.com)

**ABSTRACT**

The purpose of this research is to improve the result of physics study and to achieve a minimum completeness criteria (KKM) by using Contextual Teaching Learning method for class X Science 2 SMAN 68 Jakarta. KKM value at SMAN 68 Jakarta for physics subjects is 75. The method of this research is class action research, which is collaboration between university students, teachers and lecturer. This action research by Kemmis & Taggart begins with stage: 1) Plan, 2) Act, 3) Observation, and 4) Reflection. Contextual Teaching Learning is a teaching system that linking physics lesson with the context of everyday life of student. Contextual learning model has seven stages, namely: constructivism, inquiry, questioning, community learning, modeling, reflection and authentic assessment. The subject of the research were university students, teachers, and lecturer and the object of the research was 36 students at class X science 2. This research has been done at SMAN 68 Jakarta-Indonesia in November 2013, semester I. The research was conducted in two cycles, each cycle consist of two meetings. Where each cycle started from planning, implementation actions, observations and reflection. Data research has been used from student learning outcomes, interviews and events in the field, which is authorized by data triangulation. The results of this research showed that in the first cycle of mastery learning students reached 45.2 %, in the second cycle of mastery learning students achieved to 86 %. The conclusion of this research is The Contextual Teaching Learning can improve the learning outcomes of students in physics.

**Keywords:** Contextual Teaching Learning Model (CTL), learning results, learning physics.

**BACKGROUND**

One of the goals physics at the senior high school according to permendiknas No. 22 tahun 2006 is as a vehicle or the means to train the students to be a knowledge, the concept, and physics, and have skills and attitudes scientific.

In each follow the process of learning in schools would have been all the participants students hope to get a good learning result result, for a good learning the learners can help to achieve their aims. A good learning result only achieved through a good learning process. If the learning is not optimal result is very difficult is expected to be a good learning.

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Based on observation result in a less satisfactory. Inquiry needs analysis and interview students Mathematics and Science class X 2 SMAN 68 Jakarta shows difficulties faced by the students are learning. When given pretest 60% students get a under KKM. Students households materials were difficult to understand and in the apply that in his life.

The low student learning outcomes was Acknowledges potential negative environmental impact from from less effective learning process took place. According to observation in the field, and an interview with the students, in the teaching in class X science 1, X science 2, and X science 3 teachers explain the subjects physics with oriented to PPT and PesonaEdu, while X science 4 and X science 5 teachers teaching methods lecturing. So that the atmosphere to learn to tiresome are. The teacher explained experienced formula and examples of questions that similar. other factors that were supposed to be as the main cause low learning science especially physics is teaching physics which is run by educators there are still separate the learners physics formal knowledge with day-to-day experiences the students.

Because of that needs to be formulation that brought students in the teaching that presents real world in the classroom. Learning Model, which is a model *they started teaching learning*, which will be referred contextual learning. Contextual learning (CTL) is a concept to learn that help teachers who taught link between matter and the situation real world students to encourage students to make the connection between the knowledge that belonged to him and its application in their lives as a member of the royal family and community.

Based on the explanation above that instruction to that result in accordance with the intention that have been planned, teachers need to consider teaching and learning strategies that can be more effective. Therefore, it have to be research on " Improving the Result of Physics Study of the students on Particle Dynamics Topic by Using Contextual Teaching and Learning in X science 2 at the SMAN 68 Jakarta ".

### **Problem Formulations**

Learning model is the application *they started teaching learning* in the matter dynamics particles can improve student performance?

### **Research Objectives**

Learning model To know the application *they started teaching learning* in the matter particles dynamics in improving student performance in science class X 2 in SMAN 68 Jakarta.

## **LITERATURE review**

### **The fact Learning**

Learning outcomes that was quoted by Ngalim Purwanto (2003:84) are:

"Learned is a power or resources to grow from the themselves someone with (the individual). By their behavior study related to a certain situations that due to repeatedly moving experience in that situation, where behavior change, that cannot be explained or the tendency response talent, maturity or the circumstances just one (e.g. , fatigue, drug effect, and etc)".

Learning outcomes that was quoted by Munir (2008:146) are:

"So changes in behavior is the result learning. On that is encompassed the knowledge (*cognitive*), attitude (*affective*) and skill (*impact*). Learning on aspects of knowledge is not known to know, in the skills of not be able to be able to. Changes that occurred in soul on

changes in their perception and understanding that is not always in the form on which can be observed. Learning as changes knowledge that are stored in memory. The teaching and learning in view as processing information on three stages, namely attention (*called ada* ()), writing in the form of symbols (*encoding*), and get back information (*retrieval*)".

Physics as science study of the material or substances that covers the fisis, composition, changes, and the energy that it produces. Talk about technical evaluation in the teaching and learning processes in physics is very interesting particularly in the various test in physics hunungannya with a question physics. Several forms test answers among other test right or wrong, test choice test and other forms like test with stuffing or also form or writing essays. In a process to teaching physics that is meant by a physics lesson assessment result is a work in layers of measurements and assessment that relate to the measurement result a physics lesson, learning assessment and physics result drew a physics lesson (Kemajaya, 2007:8).

The criteria Thoroughness Minimal (KKM) is a reference to basic guidelines learning achievement in determining the students. Based on the decision DEPARTMENT (2008:51) Criteria thoroughness minimum set by education unit based on subject teachers result of the discussion disatuan education or some education units that have characteristics that is almost the same. Directors educators or MGMP forum Subject Teacher Conference academically as the consideration the determination KKM.

Based on the Letter of the school principal decision and MGMP meetings with SMAN 68 teachers Physics, the KKM set for subject physics is 75.

Based on opinion of experts in over, it can be concluded that the fact learning outcomes is the changes that occurred after the occurrence of a process with their lessons. Thus, the study can be observed and measured by means of a test. Learning outcomes assessment physics itself was related to the measurement learning assessment and physics learning physics. Learning the meaning of the learning this research is the result in physics, which was held at the SMAN 68 Jakarta with the KKM Physics of 75.

### **Contextual Learning / The fact they started Teaching Learning (CTL)**

According to Elin Rosalin (2008:26) holds "CTL is an approach to learning and teaching materials that ties between taught and the situation real world students to encourage students to make the connection between the knowledge that he had with its application in their lives as individuals, a member of the royal family, community, and the nation".

According to Nurhadi et al, contextual learning (2004) (*they started Teaching and Learning*) is a concept learning where teachers present real world class and encourage students to make relationship between the knowledge that he had with their daily lives its application in the day, while students to gain knowledge and skills of the context are limited, little by little, and from the mengkontruksi himself, as provisions to solve the problems in his life as members of the community.

According to Sanjaya (2006). Using CTL teaching and learning is a strategy that emphasizes to process student involvement in a full for dapatmenemukan materials that are learned and connect with the situation real life so that cannot apply it to encourage students to the kehidupanmereka.

Some sense Of it can be concluded that teaching models contextual learning (CTL) is a concept to learn that help teachers who taught link between matter and the situation real world students to encourage students to make the connection between the knowledge that belonged to him and its application in their lives as a member of the royal family and community.

But sintak from this model of teaching, namely (1) phase *Constructivism* : students work on its own and mengkontruksi own knowledge, (2) phase *Inquiry* that students find by itself knowledge and skills, (3) phase *Questioning* the students are asked to the teacher of hal yang has yet to be understood, (4) phase *Learning Community* that students join to make group, (5) phase *Modeling* the students are implementing media, which brought teachers so that the students are more easily understood the material that is taught, (6) phase *Reflection* the students to make the connection between that has been gotten by pelajaran life in fact, (7) phase *Authentic Assessing* the assessing student learning outcomes.

Some of the things that need to be addressed to use a collaborative approach teachers CTL :

1. The role of the teacher is not as an instructor or a ruler who to impose his will, but a teacher is supreme guide students so that they can learn in accordance with the stage its development.
2. The role of the teacher for choosing materials - learning materials that are considered to be important to be learned by the students.
3. The role of the teacher is to help so that each student to be able to find a link between new experiences with previous experience.
4. The role of the teacher is facilitating (makes) so that the children to be able to do process assimilation and process accomodation.

## RESEARCH METHOD

The methods used in this research is classroom research activities (Classroom Action Research). (In Kunandar, 2008) Classroom Action Research according to Kemmis and Mc Taggart is the discovery problem on their own groups will be done by the participant-participants in a situation that aims to develop or increase rationality and to assess these practices social and educational them as soon as they come to understand situations. Research was done in the cycle, each of which siklus consists of planning (*planning*), action (*acting*), observation (*observing*), and reflecting (*reflecting*).

This Research carried out in SMAN 68 Jakarta in Mathematics and Science class X 2 first odd academic year 2013/2014. SMAN 68 Jakarta is located at Jalan Salemba Raya No. 18 Central Jakarta.

*The cycle 1*

### a. Planning

The planning process In action, researchers made an instrument data collection as sheets observation, tests ability to think the learners and worksheets. Make plans for teaching (RPP) that is in accordance with model of teaching *order* that will be delivered by Teaching Learning in the process of learning in the matter circular motion.

### b. Implementation

In the final teaching learning model researchers use *they started Teaching* the steps to Learning as follows:

Table 1. The design activities or In the cycle I

Events	Stages CTL.	Details in	Time
Observe ( <i>observing</i> )  Ensnared ( <i>questioning</i> )	Asked ( <i>questioning</i> )	<p>Introduction</p> <ul style="list-style-type: none"> <li>• Self Reflection order result (KD) about movement is straight</li> <li>• Passing the purpose of the lesson.</li> <li>• Motivation and Apperception: Looking at a demonstration of video (car that is moving all of a sudden in brake and car lived all of a sudden move). What happens if the car that you were to stop all of a sudden?</li> <li>• Ask questions and collect orally task of finding information about the Laws I Newton through various sources (books, the internet or modules)</li> <li>• Carrying out pretes characteristics law I Newton</li> </ul>	15 Minutes
Data Collection ( <i>Experimenting</i> )	Constructivism (Learning Theory), inquiri, modeling and learning community	Core activities	5 Minutes
		<ul style="list-style-type: none"> <li>• Students are divided into small groups, each consisting of 4 people</li> </ul>	
		<ul style="list-style-type: none"> <li>• Students prepared tools and materials that will be used to conduct a test</li> <li>• Students receive piece of work students</li> </ul>	
		<ul style="list-style-type: none"> <li>• Students did an experiment</li> </ul>	25 Minutes
Mengasosiasi ( <i>Associating</i> )		<ul style="list-style-type: none"> <li>• Each of the groups have had a discussion and make the jump</li> </ul>	10 Minutes
Communicate ( <i>Communicating</i> )		<ul style="list-style-type: none"> <li>• Representatives from two reported group discussion results</li> </ul>	10 Minutes
	Reflection	<ul style="list-style-type: none"> <li>• Teacher explaining students to pay attention to</li> </ul>	10 Minutes
	Learning community, Authentic assessment	<p>Closing</p> <ul style="list-style-type: none"> <li>• Students concluded characteristic Newton's law</li> <li>• Give the awards to the students (group) who behave well and good high-performance</li> <li>• A task read piece of work practices that will come</li> <li>• Carrying out posttest</li> </ul>	15 Minutes

**c. Observation**

Examinations conducted is still the same as I cycle. Posted all new findings that occurred during the learning process. Observation Data collected to be processed and analyzed

**d. Reflection**

Indicator success has been achieved so the cycle stopped.

**RESULTS & DISCUSSION**

After carried out or action this class with two cycle so by triangulation method data based on data, namely:

**1) Data events**

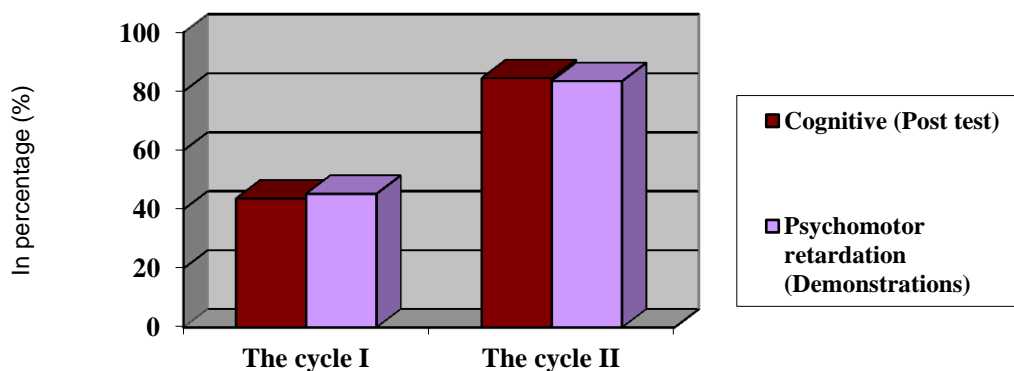
This research action class (*classroom action research*) to use the procedures developed by Kemmis and Taggrat (1990) with the draft ryhtmical cycle that will stop if there are already or will be achieved the indicator, in this case the student learning outcomes have reached the KKM Physics 75. This Research carried out on November 15, 2013 cycle (I) and november 22, 2013 cycle (II) in SMAN 68 Jakarta, which is located at Jalan Salemba Raya No. 18 Central Jakarta. Applicants Objects are the sons and daughters Mathematics and Science class X 3 first odd academic year 2013/2014. SMAN 68 Jakarta.

In this research learning material dynamics motion particles tested by the actions test students learning to get the result. Research carried out in two cycles, including both the cycle will be done reflection to sharpen up action so that can be obtained data that are really reflects the success method. The results students' learning as follows:

Table 3. Data results students Learning at cycle I and II cycle

<b>The assessment</b>	<b>The cycle I</b>	<b>The cycle II</b>
Cognitive (Post test)	40 Percent.	86 Percent.
Psychomotor retardation (Demonstrations)	50 Percent.	85 Percent.
Affective (The attitude and Scientific motivation students)	Assessment of the attitude and scientific student motivation optimal.	Assessment of scientific attitude increased significantly. Almost all of the students were showing a enthusiastic than in following their lessons.

### A diagram student Learning outcomes In Physics lessons



Picture 4. Graph student Learning outcomes

## 2) Data Interview

This research was supported by interviews with some objects such as students and teachers. The interview result as follows:

### a. 3 Respondents Teachers

There are three questions I propose to 3 teachers were as follows: (1) Are you sure Mr if composition Teaching and Learning more experiment (doing an experiment in the laboratory) from the theoretical (lectures in the classroom)? Teachers is variable answer including two teachers said *agree*, because it applications application (practicum) is to encourage children to be active in work and honed understanding theory. While one teacher said *did not agree*, because physics more mathematical calculations in a very needed time to explain much. (2) According to Mr, whether using the media learning can have a good students understanding of the physics? All the teachers answer is yes . That learning media are very good for students understanding. What is joyful learning (3) physics that Mr to teach students are centered on students' activity (research, project, etc. ? The majority teachers answer is yes , has been actualized.

### b. 5 Respondents students

There are three questions I propose to 5 students were as follows: (1) Do you think it with the help learning media can enhance understanding the concept physics? All of the students answer is yes , that the media is very helpful once in the teaching. (2) What is in a way teachers teaching using new methods such as this (*they started Teaching Learning*) you feel happy and become more familiar with the matter? All of the students answer is yes , they said they were very happy and become more understood the concept materials. (3) Setujukah you if teachers motivating more creative, in teaching, especially in developing teaching methods that new so that it will not monotonous and students are not quickly bored in learning? All of the students answer is yes *agrees*. Teachers creative generation will give birth to a smart.

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### 3) Data Documentation



### CONCLUSION

Model of teaching Impelentasi *they started Teaching Learning in Mathematics and Class X Science 2 SMAN 68 Jakarta*, in general, the students' learning that has reached the KKM 75 on the percentage in a row achievements at cycle I (45,2%), in which its engineering cycle II (86%). It is advisable teachers to improve the ability to teach it and capability in guiding the students. Teachers are expected to be able to and want to use strategy or methods and model of teaching subjects in accordance with goods or discussed are generally about.

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