



**THE EFFECT OF GUIDED DISCOVERY LEARNING MODEL ON THE STUDENT'S LEARNING ACHIEVEMENT IN VECTOR KINEMATICS TOPIC IN CLASS XI SENIOR HIGH SCHOOL 2 LINTONGNIHUTA ACADEMIC YEAR 2016/2017**

**Partogi A.T. Hutapea<sup>1\*</sup>, Wawan Budiman<sup>1</sup>, and Reza T.D. Sitompul<sup>2</sup>**

<sup>1</sup>Department of Physics Faculty of Mathematics and Natural Sciences, Medan State University

<sup>2</sup>Science Department Faculty of Mathematics and Natural Sciences, Medan State University

St. Williem Iskandar Psr. V Medan Estate, Medan, Indonesia, 20221

\*partogi.htp01@gmail.com

Accepted: November 11<sup>th</sup>, 2019. Published: November 26<sup>th</sup>, 2019

**Abstract**

This research was aimed to know the student's achievement using guided discovery learning model and conventional learning about vector kinematics topic. This research employed a quasi-experiment pre-test and post-test with control design. The populations were 59 students grade XI-science in SMAN 2 Lintongnihuta academic year 2016/2017. The samples consist of two classes, one class with 30 students as experiment class and one class as control class with 29 students, while the sampling technique used purposive sampling. The research instrument used an essay test. The data obtained in the study were analysed using Microsoft Excel. The conclusion was there was an effect of Guided Discovery Learning Model on the student's learning achievement in vector kinematics topic in class XI SMA Negeri 2 Lintongnihuta Academic Year 2016/2017. The observation was done by observer using an observation sheet of student's activity conclude that activity of students in experiment class more active than control class.

**Keywords:** guided discovery, student's achievement, vector kinematics

## Introduction

Learning is the effort made educators to help students to receive knowledge given and to help facilitate the achievement of learning objectives. The learning process is a system that consists of students as input components, hardware and software components as instrumental input, component environment as environmental input, implementation of learning as a process, and ultimately produce an output of student learning outcomes as a component of output (Suprihatiningrum, 2013, p. 75&77).

A teacher is a person who will develop a free atmosphere for students to examine what is interesting, express ideas, and creativity within the norms enforced consistently in the learning process (Suprihatiningrum, 2013, p. 61). One of the major problems faced by science teacher today is not necessarily “what to teach” but how to teach; and the teachers’ inability to teach science in a meaningful way is identified as one of the factors responsible for student’s poor performance in this area in both public and internal examinations (Udo, 2010, p. 389-390).

Learning of physics included in learning that requires students to take an active role during the learning process takes place, however, learning of physics in schools still use conventional teaching methods because this method is easy to apply.

The physic learning process is centred on the physics teacher where the teacher explains a topic, writing on the board, and solve problems related to the topic. Students learn to memorize concepts and formulas as well as working on the problems related to the topic described teachers. Students become inactive, do not have the critical and creative thinking and easy to forget what has been learned so that the achievement of students in the physics subject is still low. Students’ achievement in physics subject can be improved by applying the learning model that can arouse students’ activeness in learning or called constructive learning.

Constructivism learning emphasizes the process of learning, rather than teaching.

Students are given the opportunity to build new knowledge and understanding based on real experience. This theory holds learning is a process, not emphasizing results. Students are encouraged to conduct the investigation in an effort to develop a natural curiosity (Sani, 2013, p. 21).

Jerome Bruner developed a theory of mental development, which describes that the learning process is determined by how to set the subject matter. Learning process occurs through stages, namely: a) direct object manipulation (*enactive*); b) the representation of images (*iconic*); c) manipulation of symbols (*symbolic*). The enactive stage is the activity of the learner to understand the environment through direct observation of reality. The iconic stage occurs when students observe reality indirectly, but through a secondary source, for example through pictures or writing. Symbolic stage occurs when students create abstractions in the form of theory, interpretation; analysis of the reality has been observed and experienced (Sani, 2013, p. 15).

One model of learning that suits constructivism learning is Guided Discovery learning model. Sund & Trowbridge in Suprihatiningrum (2013, p. 162) states discovery when an individual is involved mainly in using his mental process to mediate (discover) some concept or principle.

Students’ achievement is something that students accomplish successfully, especially by means of exertion, skill, practise or perseverance. Achievement in this context specifically refers to academic attainment of students after completing a course (Josephine, 2010, p. 26). Student learning is the growth in subject-matter knowledge, understanding, and skills over time. The most commonly used to measure student achievement is a standardized test (NBPTS, 2010, p. 28).

Based on experience during the implementation of the Integrated Field Experience Practice at Senior High School 2 Lintongnihuta, teachers still use the conventional model, discourse and giving tasks. The average value from the last exam of these students was

60. It causes students less active and the achievement is low because it is not directly involved in the learning process, therefore offered an alternative learning models that can resolve the problem. The title of this research is “The Effect of Guided Discovery Learning Model on the Student’s Learning Achievement in Vector Kinematics Topic in Class XI Senior High School 2 Lintongnihuta Academic Year 2016/2017.”

### Research Method

#### a. Research Location and Research Time

The research has been done in Senior High School 2 Lintongnihuta, Siponjot-Silaban, Kecamatan Lintongnihuta on October first semester academic year 2016/2017.

#### b. Design of Research

This research conducted in experimental design and divided into two groups, an experimental group which is applying a Guided Discovery Learning Model and control group which is applying Direct Instructional Model. Pre-test and post-test were administered to both experimental group and control group before and after treatment. The design of research can be shown in Table 1.

**Table 1 The Design of the Research**

| Group | Pre-Test       | Treatment | Post-Test      |
|-------|----------------|-----------|----------------|
| A     | T <sub>1</sub> | X         | T <sub>2</sub> |
| B     | T <sub>1</sub> | O         | T <sub>2</sub> |

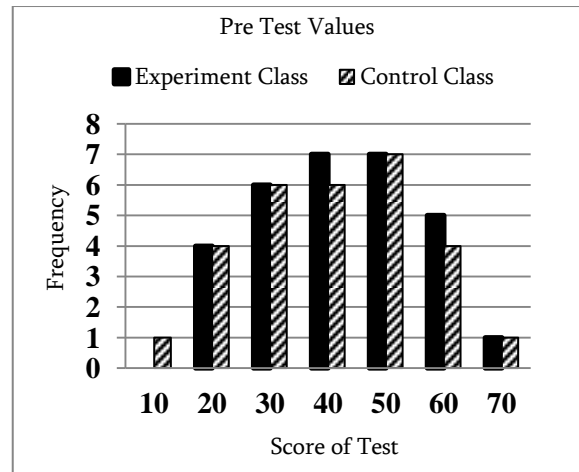
Note:

- A = Experimental group
- B = Control group
- T<sub>1</sub> = Pre – test for experiment class and control class
- T<sub>2</sub> = Post – test for experiment class and control class
- X = Applying Guided Discovery Learning
- O = Applying Direct Instruction

### Result and Discussion

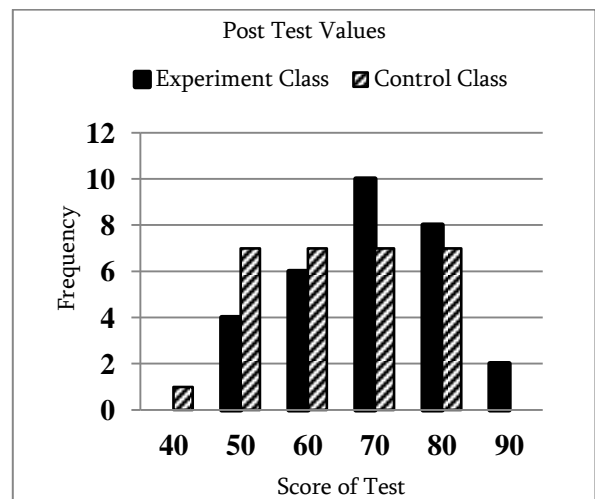
#### a. Result

The result of this research was obtained from two classes, experiment class with number of students is 30 and control class with number of students is 29. Both of classes given pre-test to obtain initial achievement before treatment applied. The two classes had been treated by two different treatments, experiment class treated by guided discovery learning model and control class by direct instruction. The columns of pre-test values can be shown in Figure 1.



**Figure 1 Columns of Pre Test Values**

The columns of post-test values can be shown in Figure 2.



**Figure 2 Columns of Post Test Values**

#### b. Discussion

Discovery learning is an important component of modern constructivist approaches that has a long history in education innovation. In

discovery learning, students are encouraged to learn largely on their own through active involvement with concepts and principles, and teachers encourage students to have experiences and conduct experiments that permit them to discover principles for themselves. The increasing of student's achievement in experiment class because learning process using Guided Discovery Learning Model carried students to find a related concept of topic. Teacher's role is to guide and provides instructions that students needed in learning process. Students found the concept from observation and analyze of learning sources and discuss in group. The Guided Discovery Learning Model can improve learning achievement but during the teaching and learning process, this model has disadvantage such as students not ready to present and afraid to present their discussion result and the use of time is less effective.

### Conclusion and Suggestion

There is an effect of Guided Discovery Learning Model on Student's Learning Achievement in Vector Kinematics Topic in Class XI SMA Negeri 2 Lintongnihuta Academic Year 2016/2017. Researcher suggests the using of this model require more time to obtain the most effective result.

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