

# *Application of Learning Model Learning Guided Discovery with Scientific Approach to Enhance Learning Competency Science Seventh Grade Students*

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**Abstract** – Classroom management VII SMPN 2 Gunung Talang not fully in accordance with the demands of Curriculum 2013. One was the application of learning models, which have not been able to improve critical thinking and curiosity of learners. Lack of critical thinking skills and scientific attitudes of learners have an impact on learning outcomes IPA competence which is still below minimum completeness criteria (KKM). This study aims to determine the increase competence of learners in learning science by applying the learning model guided discovery learning in class VII SMPN 2 Gunung Talang.

This type of research is classroom action research. The study consisted of three cycles. Each cycle consisted of three meetings. The subjects of this study are learners VII.i grade SMPN 2 Gunung Talang. Classroom action research design using a model Kemiss & Taggart, which each cycle consists of: planning (planning), action (action), observation (observing) and reflection (reflecting). The instrument used in this study is a test sheet of learners. Competence of learners is said to be completed individually, when reaching the KKM categories with 78, while classically when it reached 85%.

The results showed that the competence of the knowledge of learners ranging from prasiklus until the third cycle is 63.33%, 70%, 80% and 90%. The completeness of competence attitudes of learners ranging from prasiklus until the third cycle is 62.71%, 69.3%, 77.08% and 85.67%. Meanwhile, for completeness of competence skills of learners ranging from prasiklus until the third cycle are 71.66%, 72.57%, 83.6% and 85.83%. Based on this, it can be concluded that an increase in the competence of learners in learning science by applying the learning model Guided Discovery Learning in class VII SMPN 2 Gunung Talang.

**Keywords** – Classroom Action Research; Guided Discovery; Scientific Approach; Competence.

## I. INTRODUCTION

Learning is a process of interaction between learners, between learners and teachers and learning resources in a learning environment. Learning is a process of development potential and character development of each learner as a result of synergies between education that takes place in schools, families, and communities. The process provides an opportunity for learners to develop their potential to evolve the ability that progressively increasing in attitude (spiritual and social), knowledge, and skills needed him for life and for the society, the nation and contribute to the welfare of mankind.

Learners are a subject that has the ability to actively search for, cultivate, construct and use knowledge. For that learning should be regarding the opportunities given to students to construct knowledge in cognitive processes. In order to truly understand and can apply the knowledge; learners should be encouraged to work to solve problems, find everything for themselves, and strive to realize their ideas.

Enforcement of the 2013 curriculum emphasizes the scientific approach in the learning process; the teacher uses a variety of learning models of teaching and learning activities. The government recommends three models of learning in the curriculum implementation in 2013 is a model Project Based

Learning, Discovery Learning / Inquiry and Problem Based Learning.

Given the importance of learning science, the teacher should always evaluate the learning process in the class, such as the use of appropriate models and methods in the learning process in order to obtain good learning outcomes of all competencies, both knowledge, attitudes and skills. Evaluation of teachers on a regular basis to the design and implementation of the learning process using the right strategy is needed to improve the competence of learners learn science better than the competence of knowledge, attitudes, and skills.

Learning that takes place in class VII SMPN 2 Gunung Talang have tended to use the method of discussion and lectures, the outline can be described as follows: (1) Master still dominate activity in the classroom (2) Teachers are not accustom ourselves to give an opportunity to participants students to determine their own knowledge (3) the teacher was not to give a stimulus to students to ask questions (4) Teachers are less motivated and facilitate learners to increase interest in reading (5) Teachers are not using model recommended-kan in the curriculum in 2013 as Problem Base learning, Discovery Learning and Project Based Learning which give problems to students who are challenging so that learners are actively involved (6) Teachers not only as a guide in the discussions but also act as a conduit of information that is dominant so it tends to lecture.

The impact of the learning process that is not in accordance with the demands of curriculum learning outcomes IPA 2013 lead to the competence of learners knowledge still exist that under the minimum completeness criteria (KKM). KKM SMPN 2 Gunung Talang IPA is 78. One of the classes are still a lot of test scores of students under the KKM is a class VII.i.

In recent years, one of the materials science class VII daily test scores of students who under the KKM is a matter of Life Organization System. This is evidenced from the classical completeness ranges from 60% - 67%. Matter of Life Organization System chosen in this study because the material is new to the students in class VII which have not they get the time in elementary school. This material also introduces that person's body for example learners, is an example of a system. The introduction of the concept of system refers to the nature of the biological hierarchy ranging from the smallest unit components (cells) to the

largest is the biosphere, but emphasize learning through the hierarchy of the organism.

When the learning condition is allowed to drag it will reflect badly on the study of students who ultimately quality of education at SMPN 2 Gunung Talang will fall so that the national education goals will not be achieved. To overcome these problems is necessary to find another alternative to doing research. One of the efforts that will be done is to apply the learning model Guided Discovery Learning (GDL).

Model GDL is an elaboration of the model of Discovery Learning (DL). Model DL is one model which is recommended-right government to be implemented in 2013. Learning Curriculum discovery (discovery) is a learning activity or designed so that learners can discover the concepts and principles through his own mental processes. Concepts and principles found learners, can be through observation, classify, make assumptions, explain, draw conclusions, and so forth. However, it is difficult to occur so that the need for referrals from teachers to guide the students to become a pure inventor, the one model that can be used is the model GDL.

Based on the application of the model GDL is expected to overcome the problems in the learning process in the classroom VII.i because with the instructions of teachers, learners will work more focused in order to achieve the goals set. However, note that the teacher is a director in the learning process. This is in line with the opinions Dzaki (2009), explains that the guidance of the teacher is not the sort of steps that must be followed, but only a directive on working procedures are required. Based on research conducted by Mayer (2004) concluded that the Guided Discovery Learning is more effective than Pure Discovery in helping the process of transfer and learners. Along with Meyer, pe-nelitian conducted by Aini (2011) mem-prove that by applying the GDL can improve learning outcomes and scientific communication skills of learners.

Based on the background of the problem, will do researches of class action entitled "Application of Learning Model Learning Guided Discovery with Scientific Approach to Enhance Learning Competency Science Seventh Grade Students of SMP N 2 Gunung Talang".

## II. REVIEW OF LITERATURE

### 2. Theoretical Basis

#### 2.1 IPA Learning Characteristics on Curriculum 2013

IPA essentially covers four main elements: (1) an attitude: curiosity about objects, natural phenomena, living beings, as well as the causal relationship that raises a new problem that can be solved through the proper procedure, the IPA is open-ended; (2) process: the troubleshooting procedure through the scientific method; scientific method includes the preparation of the hypotheses, designing experiments or trials, evaluation, measurement, and conclusion; (3) products: in the form of facts, concepts, principles, theories, and laws; and (4) application: the application of scientific methods and concepts of science in everyday life. IPA's four main elements should appear in science learning.

Learning science curriculum in 2013 to develop the competence of learners in the realm of attitudes, knowledge, and skills. The third domain has a trajectory acquisition of these competencies (psychological processes) are different. Attitude is obtained through the activity of "accept, execute, respect, appreciate, and practice". Knowledge is acquired through the activity of "remembering, understanding, applying, analyzing, and evaluating". Skills acquired through activity "observe, ask, try, reasoning, menyaji, and create". In learning science, the track "observe, ask, try, reasoning, menyaji, and create" is used as a driver for the path of the other. The approach used is called a scientific approach (*scientific approach*).

#### 2.2 Learning Model Guided Discovery Learning

Education figure who first introduced the discovery learning is Jerome Bruner (1961). He is a renowned educator who seeks to introduce learning strategies through observation and investigation consistently and systematically. The emergence of discovery learning or commonly called a discovery strategy, inseparable from diversionary see teaching practices that do not directly involve students. That's why he wants to improve teaching, during which only leads to memorize facts and does not provide an understanding of the concepts or principles contained in the lesson (Divine, 2012: 41).

Discovery is a search result of knowledge (discovery can be thought of as the results of seeking knowledge), it can also be said that the discovery an approach to learning or education that requires students find ideas and information through the efforts of his own study of the material that has

been given to them (Lufri, 2007: 26). Furthermore Ruhimat (2013: 209), approach discovery this can in principle be used as a model or a learning system that helps learners either individually or in groups to learn to find themselves in accordance with their respective experiences. So if viewed in terms of emotional satisfaction, a result find themselves will have higher satisfaction scores compared with the results of administration.

#### 2.3 Scientific Approach

Learning which uses scientific approach is learning that emphasizes providing direct experience either using observation, experiment or other means, to develop science skills so the students made creative and able to learn science a higher level in a relatively short time (Sujarwanta, 2012). Similarly Hosnan opinion (2014: 34) states involving scientific learning process skills, such as observing, classifying, measure, predict, explain, and concluded. Scientific Learning is a scientific study. According Machin (2014: 33) scientific learning can suppress certain attitudes or values, such as attitudes refrain from dogmatism, flexible, creative, honest, logical, open tau criticism, conscientious, love of duty and understand the risks.

#### 2.4 Learning Competence

Yamin (2012: 27), reveals the ability of the cognitive domain in the ability to "think", the ability of a more simple ability, namely remembering, to the problem-solving skills that attract students to interact and strategies, previously to solve the problem

According to Yamin (2012: 27), in the cognitive domain there are six levels with different aspects of learning, namely:

1. Level of knowledge or knowledge. This level asks students to recall previously received information, example facts, terminology, and formulas and so on.
2. Level of understanding or understanding. Categories of understanding related to the ability to explain knowledge, information that has been known in words alone. In this case the student is anxious or with a keyword that has been heard in his own words
3. Depth of application or application. It is the ability to use or apply learned information into new situations, and solve problems that arise in everyday life
4. Levels of analysis or analysis. It is a component to remember, separate or differentiate one, concepts, opinions, hypotheses or conclusions, and the configuration of each component to see.

5. Level of synthesis or synthesis. There is a person's ability to link and unite the various elements and elements of existing knowledge to form new patterns more.
6. Level of assessment or evaluation. What is the highest level that students expect to make judgments and judgments using concepts, methods, or by using certain criteria. So evaluation here is more likely to be a regular assessment of an evaluation system.

### III. METHODS

The research is a classroom action research is research in the classroom that teachers aim to improve the learning process. The teacher's action is a new learning model for teachers and learners. Thus, the actions taken by learners are not an act that is commonly practiced.

The subjects were learners VII.i class SMP N 2 Gunung Talang in the academic year 2016/2017, aGununging to 30 people consisting of 12 women and 18 men with characteristics of air-ability learners are heterogeneous.

Classroom action research is done using a model developed by Kemmis & Taggart in Arikunto (2010: 137) per one cycle consists of four stages: planning, implementation, observation, and reflection, the fourth stage in the action research is forming a cycle, successive round of activity is never a single activity, but it is always a series of activities that go back to the origin.

Data collection techniques used are giving the test. Giving tests were conducted to obtain data on the knowledge competence.

#### 3.1 Data Competence Knowledge

Competence knowledge based on individual learning completeness percentage is based on the analysis of daily tests using formula.

$$KI = \frac{SB}{SM} \times 100$$

Description:

KI = Mastery learning individually

SB = Correct Score obtained learners

SM = maximum score (Arikunto, 2006: 197)

Table 1. Categories of Knowledge Competency Assessment

Interval	Category
86-100	Excellent (A)
71-85	Good (B)
56-70	Fair (C)
≥ 55	Less (D)

Source: Permendikbud No. 53 2015

Data competence of individual learners' knowledge is said to be complete if it has reached the minimum completeness criteria (KKM) set by the school. KKM teaching science to grade VII in SMP N 2 Gunung Talang is 78, so learners will be said to be complete if the value obtained is  $\geq 78$ .

Competence of knowledge based on the percentage of overall mastery learning (classical) in each cycle based on an analysis of daily tests. The number of learners who completed individually would affect the classical completeness. The completeness of learners in the classical can be found using the formula.

$$KK = \frac{JST}{JSS} \times 100\%$$

Description:

KK = mastery of classical

JST = Number of learners who completed

the JSS = Sum of all learners (Arikunto, 2006: 197)

Competence of knowledge is successful/ complete if 85% classically learners achieve KKM of  $\geq 78$  (Arikunto, 2006: 197).

### IV. DISCUSSION AND RESULTS RESEARCH

#### 4. Result

Based on the findings of the application of learning models Discovery Guided Learning the scientific approach to improve science learning competencies of learners class VII N 2 Gunung Talang, can be described as follows.

##### 4.1. Pre Cycle

Prasiklus activities carried out in one session, with a time of 3x40 minutes, on Saturday January 21, 2017. Study conducted prasiklus can be described as follows.

##### 4.1.1. Preliminary Activity

The teacher said hello and asked how the students while taking a hiatus. Teachers do apersepsi and motivation by asking the question " Why do we have to eat every day? "The teacher presents the learning objectives and become clear-kan various forms of assessment will be taken. Ratings attitude to be taken is that of curiosity and critical thinking. The evaluation is an assessment of the proficiency skills in preparing the report and presented the report.

#### 4.1.2. Core activities

Teachers begin by asking the definition of the core activities of energy. Followed by explaining about the various sources of energy in life. Only a few students who pay attention and respond to what the teacher. The teacher explains the lesson with the lecture method. Learners nothing to ask the teacher. The teacher then told the students sitting in groups by combining the two tables of four or five people, and teachers share a discussion sheet to work together in a group. It is expected that after the discussions and work sheet activities, learners can grasp the material being studied. Discussion did not go well. Learners' lot of playing and chatting with his friends. Briefly silent after being reminded, and soon they began to fuss again. In fact there are learners who continually reprimanded but still be noisy and did not pay attention. Only one or two of the members of each group are actively trying to complete an activity sheet. Learners often looks tired of flipping through a book that is used both and they do not have any other books besides borrowing books from the library.

#### 4.1.3. Closing Event

Teachers and learners discuss the results of an activity sheet to ask representatives of the group read the answer. Teachers guide students to formulate a correct answer. Teacher's lesson closes with the conclusion. Teachers evaluate or daily tests by providing the ultimate test prasiklus the form of multiple choice questions.

### 4.2. First cycle

Stages of activities in the first cycle consisted of three meetings and four meetings conducted daily tests I. The stages are done in the classroom action research is the stage of planning, action, observation, reflection. The stages in the implementation of the first cycle can be explained as follows:

#### 4.2.1. Planning

Eventually in the first cycle is implemented based on the observation that has been done on the problem of the low competence of learners evidenced by the low achievement of KKM. Based on the researchers are planning a class action by using the model GDL. Interest GDL model application is expected to overcome the problems of lack of competence of learners.

In this activity structured learning strategy that focuses on process-oriented learning on the learner by using the model GDL. Planning is done in the first cycle background of the

problems encountered in the initial observations. Prior to the study carried out it is necessary to do the following things.

#### 4.2.2. Measures

Implementation of the action on the first cycle is held from January 23, 2017 until February 6, 2017. On stage the teachers carry out the action in accordance with the implementation of learning that has been prepared in advance in accordance with the model GDL. Model GDL has several stages of phase 1) Stimulation, 2) Problem statement, 3) data collection, 4) Data processing, 5) Verification, 6) generalization. Implementation of the action consists of preliminary activities, core and cover. Implementation of the action on the first cycle held three meetings. Meeting one, two and three is the implementation of the learning process, while the fourth meeting held daily test cycle I.

#### 4.2.3. Core

Stages Stimulation activities. Prior to activities stimulation generally given researchers explain briefly about one-celled organisms. Stimulation is given by turning a video about one-celled organisms that *Euglena*, sp as shown in Figure 3. Based on the video aired researchers, learners can see that *Euglena* is composed of a single cell in the body and *Euglena*, sp there are few component called cell organelles. But some people do not pay attention to the explanation learners researchers that Ghufran, Fadil, Heru, and Rahayu. Researchers reprimand learners who do not notice an explanation of the material to be studied.

#### 4.2.4. Closing

In closing activity researcher meriview result of learning activities. Researchers provide opportunities for learners to ask if there is a concept that is not yet understood. Researchers gave follow up with a homework assignment asks students to read materials related to the subject at the next meeting that is on the network. Researchers closing the lesson by reading the greetings.

Competency assessment sheet Based on the analysis of students in the second cycle, seen an increase at every meeting. Competence of learners individually and classically said to be completely reached the percentage of 85%. Researchers' joint observer agreed to continue the action until the third cycle. This is due to the researcher wants to maximize the competence of learners in the implementation of GDL models that can exceed 85% of the thoroughness of the classical and the results of the second cycle of reflection does not occur again in the third cycle.

Improvement in the attitudes and skills of the students will give effect to increase students' cognitive aspect, because if the students show a good attitude and also have good skills in the learning process will have a positive impact on the mastery of the material concept. Based on the results of the third cycle of reflection, research joint observer agreed to suspend action until the third cycle. This is due to the analysis results obtained from the competence of learners in the third cycle has been increasing and is already very high. Competence of learners individually and classically has exceeded a predetermined limit of 85%. To see the comparison can be seen in the following table

Table 1. Comparison of Percentage of Knowledge Competence Learners During Research

No.	Cycle	The average value of UH	Completed	Not completed%
1	Prasiklus	71.50	63.33	36.67
2	Cycle I	78.83	70	30
3	Cycle II	81.50	80	20
4	Cycle III	86.83	90	10

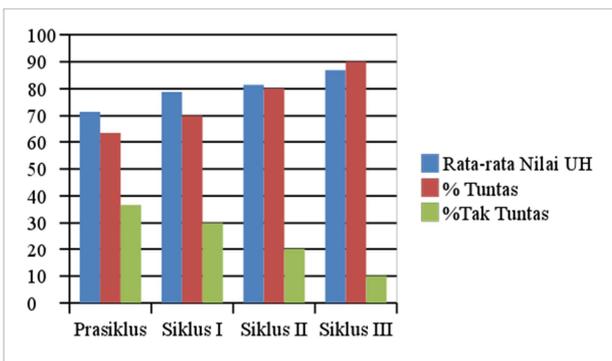


Figure 1. Comparison of Knowledge competency Evaluation learners for research

### 4.3. Discussion

The results show that by using the model GDL can improve the competence of learners in science learning, especially in the matter of Life Organization System. This is caused by the use of the model GDL can be a positive influence on active learners and learner motivation in learning. Model GDL requires learners to cooperate in solving the problems *stimulation* that must be solved in each group. The impact of students actively involved in learning both in discussions and experimenting.

The problems solved in this study are the problem related to the subject matter in accordance with stimulation the different each meeting. The role of teachers in the application of the model GDL is to formulate the problem statement and guiding learners in solving problems and to help learners relate to the material being studied. Problems are solved every meeting is different. The problems that the teacher not only be given in oral form, but the problem will be solved packed into LKPD given to the learner, every learner get LKPD which already contain the problems and questions related to the learning materials. This facilitates the students in group discussions and cooperation with each group, as well as making them more active in learning. The learning process that directs learners directly involved in solving the problems that will create meaningful learning contextual.

Model GDL can be said to be a learning model that is designed so that students gain important knowledge, which makes them adept in solving the problem, and it has its own learning models and have the skills to participate in the group. The learning process uses a systematic approach to solve a problem or face a challenge that is later needed in everyday life. This is in accordance with the opinion Deneher (2009: 40) guided discovery made by learners can lead to the formation of the ability to perform free at a later invention. Guided discovery learning activities have similarities with learning activities oriented process skills. Guided discovery learning activities emphasize on the learning experience directly through the investigation, found the concept and then apply a concept that has gained in everyday life.

Each cycle improved as a result of reflection of each cycle. As a basic revision every action should refer to the results of previous investigators. To reshuffle group is basically the result of research Takeda (2014) which states that the implementation of learning which demands collaboration between boys and girls at the age of 11 -18 years (gender effects) shows the difficulty of cooperation (incorporation).

Changes in group members are also based on the research results Federer (2016) which menyatakan that "the effects of gender on learning biology primarily requires working together between girls and boys have learning outcomes are different, male students preferred learning materials that challenge, while women do not like the learning materials that are difficult and challenging.

## V. CONCLUSIONS

Implementation of learning model Guided Discovery Learning can improve the competence of knowledge of learners in science teaching in class VII SMPN 2 Gunung Talang. Prasiklus completeness percentage of 63.33%, the first cycle of 70%, 80% the second cycle and the third cycle by 90%.

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