

Implementation of Guided Inquiry Learning Models Aid of LKS to Improve the Competency of Learning Science Biology in Class VIII.D MTSN Padang Panjang

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Abstract – Completeness of learning is closely related to the learning process that occurs in schools. The involvement of students as a whole in the learning process affects the ability of students to remember the material being studied, which affects the knowledge, understanding, and skills of students. Inquiry learning is a learning model that encourages students to learn mostly through active involvement with the concepts and principles of conducting experiments that allow them to discover principles for themselves. The purpose of this study was to improve the students' competency in learning science in the affective, psychomotor, and cognitive domains of class VIII D MTsN Padang Panjang through the application of guided inquiry learning models. The research method applied is a classroom action research method with the research subjects of class VIII D MTsN students in the 2015-2016 school year. The percentage of pre-cycle affective competence was 56.21%, cycle I was 78.22%, and cycle II was 88.45%. The percentage of pre-cycle psychomotor competence was 71.88%, the first cycle was 81.94%, and the second cycle was 90.28%. The percentage of pre-cycle cognitive competence was 64.88%, the first cycle was 77.06%, and the second cycle was 80.15%. These data show that the application of guided inquiry learning models assisted by student worksheets can improve students' competency in learning Biology Science

Keywords – Guided Inquiry, Knowledge Competence, Attitude Competence, Skill Competency.

I. INTRODUCTION

Completeness of learning is a reference to determine the success of students. The low achievement of learning outcomes is an educational problem that must be evaluated by the teacher as the person in charge of learning activities. It aims to make efforts to overcome it, because the achievement of competence and / or learning objectives is strongly influenced by the teacher. Completeness of learning is closely related to the learning process that occurs in schools. The involvement of students as a whole in the learning process

affects the ability of students to remember the material being studied, which affects the knowledge, understanding, and skills of students. Hamalik stated the same thing that learning is not enough just by listening and seeing but must do other activities including reading, asking, answering, arguing, doing assignments, drawing, communicating, presenting, discussing, concluding, and utilizing equipment [1].

In an effort to teach students, teachers are required to have multiple roles so that they can create an effective learning process. In order to be able to learn effectively, teachers must

increase the learning opportunities of students as well as improve the quality of their teaching. As a teacher, researchers have attempted to attract attention and motivate students to actively participate in learning activities, trying to create an atmosphere that is conducive to fostering positive and confident attitudes of students. Several variations of learning that the researchers have done so far, such as lectures interspersed with questions and answers, giving assignments, group discussions and using learning media in the form of projectors, as well as carrying out practicum in the laboratory, have not given the expected results. This happens because teachers are still using the teacher centered learning model. So that these variations are not able to make students active in the learning process. The researchers use this method in all classes that the researcher teaches, but the learning outcomes show different results in class VIII D, namely only 22 students who have met the completeness standards of 34 people. learners. In addition, so far, the psychomotor assessment by teachers has not been carried out accurately. Most of the psychomotor scores of students are only based on the teacher's memory without concrete measuring tools. There are several factors that cause this to happen, including the quality of implementation by the teacher.

One way to overcome this problem is to apply a learning model that can activate students. According to Lufri, one of the learning approaches that are known to activate students is the inquiry approach. The inquiry approach is a learning approach that directs students to find knowledge, ideas, and information through their own efforts. Rustaman stated that with inquiry learning, students are encouraged to learn mostly through active involvement with the concepts and principles of conducting experiments that allow them to discover the principles for themselves [2,3].

In addition, MTsN Padang Panjang teachers still use worksheets available in the market. This is due to the lack of time and ability of teachers to make worksheets themselves. As a result, the student worksheets do not function optimally because they are considered less representative in the presentation so that the student worksheets only function for practice questions. Responding to this, the researcher believes that to complement the problem solving of active student involvement is to use worksheets that can provide real experiences to students in finding their own knowledge. With worksheets that are tailored to the needs of students, it is expected that they can increase the activities of students in the learning process. The activities of students physically and mentally will affect the achievement of learning outcomes from the psychomotor, affective and cognitive aspects. The

Ministry of National Education stated that the tasks instructed in the activity sheet for students must be clear about the basic competencies they will achieve [4]. Starting from all these, the researcher conducted a classroom action research to improve the learning process and increase competence biology class VIII D MTsN Padang Panjang students through guided inquiry learning assisted with worksheets.

II. METHODS

The research method used in this research is Classroom Action Research. Lufri stated that action research (action research) is a process of studying practical problems that are situational and contextual that are proposed to determine the appropriate action in order to solve the problem faced or fix something [5]. The research was conducted at MTsN Padang Panjang in the even semester of the 2015-2016 school year. The subjects of this research were students of class VIII.D, with 34 students, consisting of 16 boys and 18 girls.

The research was conducted in 3 cycles, namely: pre-cycle, cycle I, and cycle II. The research was carried out on matter, digestion, photosynthesis and the respiratory system in humans. This research lasted for 24 hours of lessons with 12 meetings including the implementation of daily tests at the end of each meeting in each cycle. Each cycle consists of four stages starting with planning, implementing, observing, and reflecting [6].

The research instrument used to collect data on student learning outcomes in this study was a learning outcome test sheet, observation sheet, field notes, and documentation. Learning outcome test sheets were used to assess the development of students' cognitive competencies. The observation sheet consists of two types, namely the observation sheet to assess the effective and psychomotor competence of students. Field notes filled out by observers during the research implementation. Documentation is taken in the form of video lesson implementation during the research.

Data sourced from the affective and psychomotor observation sheets were analyzed by equation 1, with reference to the assessment categories shown in table 1. Meanwhile, cognitive competency data were measured based on individual completeness and classical completeness.

$$FC = \frac{\text{Score obtained}}{\text{Maximum score}} \times 100\%$$

Table 1. Affective and Psychomotor Domain Assessment Categories

Percentage	Criteria
0-20	Not good
21-40	Less
41-60	Enough
61-80	Good
81-100	Very good

Meanwhile, cognitive competence data is measured based on individual completeness and classical completeness. Individual completeness is analyzed using equation 2.

$$KB = \frac{T}{Tt} \times 100\%$$

Information :

KB = completeness of study

T = correct score obtained by students

Tt = Total total score

The KKM set is 75. Thus students are said to be complete if they reach a value > 75. To see the percentage of overall learning completeness in each cycle a percentage is used with the formula:

$$KK = \frac{JT}{JS} \times 100\%$$

Information:

KK = classical completeness

JT = number of students who completed

JS = the number of all students

Classical mastery target is 75% of the total students [7].

III. RESULTS AND DISCUSSION

Before to the application of the guided inquiry learning model, during the learning process students only received, heard the information presented by the teacher and recorded things that were considered important. Meanwhile, student activities such as answering teacher questions, asking questions about material that is not understood, and issuing opinions or arguments in learning are still very low and only dominated by certain students. Supentangingrum states that the higher the achievements achieved by students, one of which is related to the size or high motivation they have [8]. Students who do not have motivation to learn will not get good quality learning and achievements. The guided inquiry model is a learning model that emphasizes the balanced development of affective, psychomotor and cognitive competencies, so that learning that applies this model feels more meaningful.

1. Affective Competence

Based on the results of the analysis of students' attitudes during the study, it can be seen that the comparison of the results obtained from pre-cycle to cycle II is in Table 2.

Table 2. Comparison of the Analysis Results of Students' Attitudes

No	Name	Pre-cycle (%)	Cycle I (%)	Cycle II (%)	Average increase (%)
1	Confidence	46,08	67,33	85,29	19,61
2	Responsible	61,76	84,64	91,18	14,71
3	Cooperate	60,78	82,68	88,89	14,06
Average		56,21	78,22	88,45	16,12
		74,29			

Table 2 shows the results of increasing the attitudes of students while conducting research. The average increase in the attitudes of students varies. The smallest percentage increase was the attitude of working together, namely 14.06%. However, the cooperative attitude from pre-cycle to cycle II was in the good, very good, and very good categories respectively. While the largest percentage increase was found in self-confidence, in the pre-cycle the students' self-confidence was categorized as sufficient, and increased to be good, and in cycle II increased to be very good. The average percentage of all students' attitudes was 74.29%.

Learning with a guided inquiry model begins solving a problem by hypothesizing. Hypothesis plays an important role in increasing students' self-confidence. Because at the time of hypothesizing students exchange ideas and express their ideas both to other students and to the teacher. If students do not believe in their own abilities and dare to express their opinions, then the learning activities for the next stage will not go well.

The self-confident attitude of students can develop skills in communicating or presenting the results of the discussions that have been carried out. Afidah states that problem-based learning is used to develop students' communication skills in various situations [9]. When a student tries to communicate the results of his thoughts to other students based on his abilities, then what he says will be clearer to these students. In addition, other students who only listen and listen will also gain knowledge from the results of listening to these explanations.

In addition to fostering self-confidence in students, the guided inquiry learning model which is identical to group

discussion activities can also foster an attitude of cooperation and responsibility. The cooperative attitude is seen when students divide the tasks of each group member according to the activities to be carried out. As for the attitude of responsibility, it can be seen from the safety of students in carrying out the tasks that have been given. Laila stated that the implementation of the guided inquiry learning model assisted by LKPD produces a good real world towards the development of student attitudes, such as honesty, discipline, responsibility, tolerance, and self-confident [10].

2. Psychomotor Competence

Based on the results of the analysis of the skills of students during the study, it can be seen the comparison of the results obtained from pre-cycle to cycle II in Figure 1.

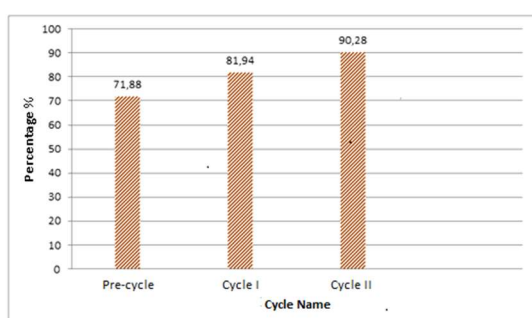


Figure 1. Comparison of the results of students' skills

The results of the assessment of the skills of students during the study increased. The average percentage increase in yield obtained was 7.81%. The biggest increase occurred in the first cycle, which was an increase of 10.06% from the pre-cycle. So it can be concluded that the learning skills of students increase using the guided inquiry learning model.

Students' learning completeness is closely related to the learning process that is undertaken in school. The involvement of students as a whole in the learning process affects the ability of students to remember and understand the subject matter being studied. Hamalik stated that learning is not enough just by listening and seeing but must do other activities including reading, asking, answering, arguing, doing assignments, drawing, communicating, presenting, discussing, concluding, and utilizing tools [11]. By working, students will gain knowledge, understanding, and skills.

Inquiry learning provides opportunities for students to seek, research and solve answers, using problem-solving techniques. This concept aims to make learning outcomes more meaningful for students. The learning process takes place naturally, students work and experience, not in the form

of transfer of knowledge from teachers to students. The guided inquiry model has a systematic syntax and has an effect on increasing the competence of students. The use of guided inquiry learning models in learning can improve the learning skills of students. Rosminarti in her research stated, there is a difference between the class process skills of students who use the inquiry learning model and those who use conventional learning models [12].

At the stage of organizing students to learn, researchers help students formulate hypotheses and organize in preparing experimental equipment to be carried out. At this stage it is seen that students work together to make hypotheses and prepare for experimental activities. Learning in groups can motivate students to be continuously involved in complex tasks and have opportunities for dialogue in developing social skills. This is evidenced by the results of the competency analysis of the skills of students who have increased each cycle.

In addition to improving social skills, the application of guided inquiry learning models in Biology science learning is identical to working on student worksheets systematically and making reports. This helps improve the competence of students' science skills. Ozdemir stated that the application of guided inquiry models can improve scientific process skills and scientific creativity of students [13]. The inquiry model is very efficient to use in science learning, because the learning design is practical and real material. Thus encouraging students to develop and inspire teamwork to reach joint decisions through various knowledge.

3. Cognitive Competence

Based on the results of the cognitive analysis of students during the study, it can be seen the comparison of the results obtained from pre-cycle to cycle II in Table 3.

Table 3. Comparison of the Percentage of Students' Cognitive Results

N o	Name Cycle	Average value	Comple ted (%)	Incompl ete (%)
1	Pre-cycle	64,88	44,12	55,88
2	Cycle I	77,06	76,47	23,53
3	Cycle II	80,15	82,35	17,65

Based on the data in Table 3, the increase in the knowledge of students from pre-cycle to daily tests in cycle II with KKM 75. Improved learning outcomes from pre-cycle, cycle I to cycle II, based on the level of classical completeness can be seen in Figure 2.

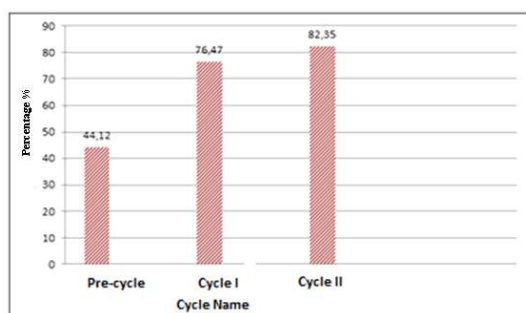


Figure 2. Comparison of Students' Cognitive Outcomes

Figure 2 shows the comparison of the cognitive results of students based on the percentage increase in students' classical completeness. Each student's cognitive cycle increases. A large increase occurred in the pre-cycle to cycle I, the increase was 32.35%. The results of cognitive competencies that increase each cycle, and have exceeded classical mastery standards. This shows that the application of the guided inquiry model in learning has achieved indicators of success. In accordance with the objectives of using guided inquiry models in learning, namely developing the ability to think systematically, logically, critically, or developing intellectual abilities, as part of a mental process [14].

Guided inquiry learning model is a learning model that involves all the abilities of students maximally to find and investigate events or phenomena that exist systematically, critically, logically, so that students can formulate their own findings. In addition, the level of understanding obtained by students is more profound because students are directly involved in the process of finding answers to existing problems and putting them into practice. Anggraeni stated that inquiry learning is learning based on the philosophy of constructivism, because through this learning students build their own knowledge. So that the knowledge received by students lasts a long time in their memory [15].

Discussions between groups will also bring up interesting ideas from other group members. This will be very helpful when students solve more complex problems so that students' cognitive abilities increase. In addition, this also has an impact on the memory of students to be sharper. Jhonson stated that through the discussion process, can improve and develop higher cognitive strategies than individual learning [16]. Cooperative learning is learning where students work together in small teams with individuals of various talents, abilities, and backgrounds to achieve common goals. It is also in accordance with the research conducted by Arisandy, that the use of guided inquiry models in biology learning can

improve student learning outcomes, this can be seen from the cognitive learning outcomes of students that increase with each meeting and each cycle [17].

IV. CONCLUSION

The application of the guided inquiry learning model can improve the affective, psychomotor, and cognitive competencies of students in learning science in class VIII.D MTsN Padang Panjang. The increase in the competence of students is seen from the learning outcomes that have increased each cycle. The percentage of pre-cycle affective competence was 56.21%, cycle I was 78.22%, and cycle II was 88.45%. The percentage of pre-cycle psychomotor competence was 71.88%, the first cycle was 81.94%, and the second cycle was 90.28%. The percentage of pre-cycle cognitive competence was 64.88%, cycle I was 77.06%, and cycle II was 80.15%.

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