

Measures for Enhancing Capability Literacy of Science and Learning Outcomes Biology through Learning Model Guided Inquiry Completed LKS SMA Negeri 1 Kecamatan Kapur IX

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Abstract –This research aims to find out increase science literacy and learning outcomes Biology on aspects of knowledge, attitudes, and skills of students in learning biology by applying the guided inquiry learning model incorporates worksheets in class X SMA Negeri 1 Kecamatan 5 Kapur IX. This type of research is a classroom action research. The subjects were students of class X 5 SMA Negeri 1 Kecamatan Kapur IX of the school year 2016/2017 as many as 31 people. The results showed that the guided inquiry learning model can improve scientific literacy, i.e. in the first cycle was: 64 in the second cycle are: 77. Percentage of learning outcomes aspects of knowledge the first cycle is the second cycle is 68.0: 77.6. Attitude aspect of learning outcomes, acquired the first cycle is: the second cycle is 73.0: 85.6 and skills aspects of learning outcomes is the first cycle: second cycle is 76.4: 85.76 average of two cycles is: good category, Based on the results of the study concluded that an increase in the ability of science literacy and the results of class X student 5 SMA Negeri 1 Kecamatan Kapur IX of the school year 2016/2017 through the implementation of guided inquiry learning model equipped with LKS.

Keywords – *Literacy Science; Guided Inquiry; Learning Outcomes.*

I. INTRODUCTION

Literacy is important mastered science students to understand the environmental, health, economic, and other problems facing modern society highly dependent on technology and the progress and development of science (Hayat, 2010: 13). Scientific literacy is important for a student's life when he participated in issues of public policy related to technology following the advances in the field of biotechnology, medicine and aerospace and especially entering the world of work is increasingly based on science (Adolphus, Telima, AA Aroyoku. (2012) . Based on this it can be concluded that the ability of science literacy is essential to implement because it will affect the progress of science and technology. However, based on test results about scientific literacy shows that the ability of scientific literacy in the poor category. This is evident from the average value 26 average of the maximum score of 49. The

results of the interview on January 3, 2016 also showed that students are less like a matter of daily tests of type essay, multiple choice, and students is more like the type of multiple choice. This is in line of research Yulianda (2016: 143) that teachers Biology rarely give the matter the form of discourse, selection compound, so declared by Yulianda that in conducting teacher evaluations should be more varied presenting problems in the form of discourse, graphs and charts, as the matter can enhance students' science literacy skills.

Low student learning outcomes one cause of the problem due to the learning model used by the teacher is not in accordance with the characteristics of students, it can also be seen in Table 1.

Based on Table 1 seen that in general the value of student learning outcomes Biology class X SMAN 1 Kecamatan Kapur IX in the school year 2016/2017 is still

low, especially students of class X 5, so it takes the appropriate treatment for the results of student learning has increased and reached KKM.

Table 1 Average Deuteronomy Semester Biology Class X SMA 1Kecamatan Kapur IX Academic Year 2016/2017

Classroom	Number of Students	average Value Deuteronomy Semester 1
X 1	34	70
X2	34	70
X 3	34	67
X4	34	67
5X	34	65
X 6	34	71
	average	68

Source: Teachers biology

Results of study on the skills aspect are still low, for example in the aspect of skill to make observations on the matter mushrooms (fungi). Students are less conscientious and less understood in identifying the problem of the object of observation so that observation data is not complete, 19% make the data accurate and precise conclusion, 81% make less precise data and conclusions. , This will impact on the ability of scientific literacy in terms of explaining scientific phenomena, because the skills to identify problems and make observations in accordance objects as the basis for students' science literacy skills. It is appropriate that otherwise OECD (2013: 17) defines scientific literacy as an individual scientific knowledge and the ability to use this knowledge to identify problems, acquire new knowledge to explain scientific phenomena, and draw conclusions based on evidence.

The observation of attitudes on learning unsatisfactory Biology is seen during learning activities teachers often ask students can anyone ask about the material that has been described, but only one person of students who asked, it shows the attitude of curiosity among students is not maximized. Dewi research results (2013: 6) shows that the influence of the scientific attitude of curiosity after the application of guided inquiry learning model, where the attitude of curiosity higher using guided inquiry learning model than conventional models.

Based on the above, we need a model of learning that can be selected to improve science literacy and learning outcomes of the aspects of knowledge, skills and attitudes. One that is guided inquiry learning model. Inquiry learning model is a learning gives students the chance to support the

conclusion that they made by way of describing objects and phenomena, ask questions, seek evidence, build explanations, test their explanations, and communicating it to others (Kim, 2011). The learning process using guided inquiry, at an early stage given more guidance and then gradually reduced guidance. Besides referring questions raised directly by teachers are also given through the questions made in the student worksheet (LKS). Therefore, worksheets created specifically to guide students in conducting experiments and draw conclusions. (Fathurrohman, 2015: 107).

Based on the above background, the researchers have been conducting research to improve scientific literacy and learning outcomes Biology through guided inquiry learning model is equipped LKS SMAN 1 Kecamatan Kapur IX of the school year 2016/2017.

II. REVIEW OF LITERATURE

Learning is programmed activities of teachers in instructional design, to make students active learning, which emphasizes the provision of learning resources (Dimiyati and Mudjiono, 2006: 297). In education learning at school not only emphasizes the accumulation of knowledge of the subject matter, but the main priority is the ability of students acquire knowledge itself (Sanjaya, 2006: 105).

Guided Inquiry learning model is that many direct inquiry and provide better guidance through the complete procedure and questions briefing during the inquiry process. Teacher much to questions on the sidelines of the process, so that the conclusions more quickly and easily retrieved (Suparno, 2007: 68). Learning more geared to the problems that must be resolved is needed inquiry learning guided by the teacher where the problem formulated by teachers and students complete upper directional guidance from the teacher. The instructions are generally the questions that are guiding the students. In the early stages given more guidance and then gradually reduced guidance. Besides referring questions raised directly by teachers are also given through the questions made in the student worksheet (LKS). Therefore, worksheets created specifically to guide students in conducting experiments and draw conclusions (Fathurrohman, 2015: 107).

Scientific literacy can be developed through discourse in textbooks or textbook science. In the examples given in one part of the textbook or textbooks can be known dimensions measured in the text accompanying questions and learning activities. Special literacy in PISA in three dimensions with

high demand in a matter-point. Each question represents a third dimension scientific literacy in PISA studies that context, the content (knowledge) and competence / process (Zuriyani, 2012: 170).

Learning outcomes appear to changes in student behavior through changing attitudes and skills. Based on the above opinion, it can be argued that the learning outcomes are changes in a person's behavior as a result of learning activities that include aspects of knowledge, attitudes, and skills. Hamalik (2006: 155) states that the study results obtained can be measured by the progress made students after studying in earnest.

III. METHODOLOGY

This research is an action research Classes is researches in the classroom that teachers aims to improve the learning process. The experiment was conducted in SMA Negeri 1 Kecamatan Kapur IX. The subjects were students of class X 5 with the number of students 31. The experiment was conducted in the second semester of March until the month of the school year 2016/2017, with a research phase consisted of, pre-stage of the cycle, the first cycle and the second cycle.

This class action research using repeated cycles, each one stage comprises four phases: planning implementation, observation and reflection. Data in the form, field notes, a daily record of observations and comments the research participants, the results of daily tests, video recordings, and photographs. The data collection technique used is the provision of scientific literacy proficiency test by using a type of matter of scientific literacy. And the results of observation. Giving tests were conducted to obtain data on biology and science literacy skills learning outcomes Biology on aspects of knowledge. The observations were made to get the data aspects of skills and attitudes.

IV. RESULTS AND DISCUSSION

4.1. Analysis Capabilities scientific literacy

Based on the analysis of upgrading scientific literacy of pre-cycle, the first cycle and the second cycle, the results achieved in the study are shown in Table 2.

Based on data in Table 2, there is increasing scientific literacy ability of prasiklus to the first cycle to the second cycle. Comparison of the results of scientific literacy ability of prasiklus, the first cycle to the second cycle, it can be seen more clearly in Figure 11, through the bars.

Table 2. Comparison of Percentage of Science Literacy Ability for Research

No	Variable/ Indicator observations	Average Percentage (%) of each cycle		
		Pre cycle	cycle I	cycle II
1.	Explaining the phenomenon of Scientific	60	64	78
2.	Evaluating and Designing the Scientific investigation	53	56	76
3.	Interpret Data and Scientific evidence	67	72	77
average		60	64	77
Category		Pretty	Good	Good

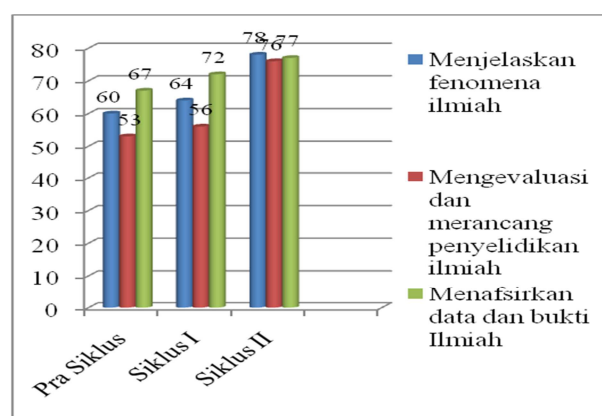


Figure 1. Comparison Science Literacy Ability of prasiklus the first cycle and the second cycle.

Figure 1. Shows the percentage ratio of the average results of scientific literacy capabilities for research increased from prasiklus to the first cycle: 4%, from the first cycle to the second cycle: 13%, overall increase of 17%.

Based on the results achieved during the study an increase in students' science literacy skills. The percentage increase in the ability of science literacy is highest in the field to explain scientific phenomena is 78 for guided inquiry learning model provides more opportunities for students to develop scientific literacy capabilities. The ability to evaluate and design the Scientific Investigation as much as 77%, while the lowest increase in the ability to evaluate and design a scientific investigation of 76%.

4.1.1. Analysis of Study Evaluation research aspects of Knowledge During

Based on the analysis of learning outcome of students' knowledge aspect of pre-cycle, the first cycle and the second

cycle can be seen comparing the results achieved during the study in Figure 2.

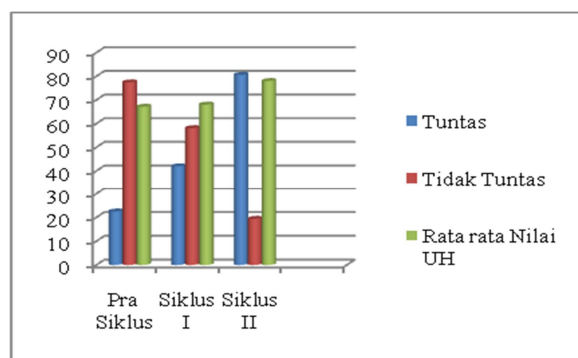


Figure 2. Comparison of Learning Outcomes Knowledge Aspects of

The mean percentage Comparison average results of studying aspects of students' knowledge during the study increased from prasiklus to cycle I: 1, from the first cycle to the second cycle: 9.6, an overall increase of 10.6.

Based on the results achieved during the study increased mastery learning outcomes aspects of students' knowledge and decrease ketidaktuntasan aspect of learning outcomes of students' knowledge. Improved learning outcomes aspects of this knowledge occurs because the implementation of guided inquiry learning model is equipped LKS provide more opportunities for students to develop the knowledge k through teacher-led discovery activities. Likewise, the subject matter of ecosystems and environmental pollution, is the subject matter that can be observed directly in the daily lives of students. Hence, in the evaluation of learning outcomes of knowledge students get a better value than the previous evaluation.

4.1.2. Analysis of Study Evaluation Research Aspects of Attitude During

Based the analysis of the students' attitude learning outcome of the pre-cycle, the first cycle and the second cycle can be seen comparing the results achieved during the study in Table 3.

Table 3. Comparison of Student Learning Outcomes for Research Aspects attitude.

Observationsindicator	averageof each cycle		
	Prasiklus	Cycle I	Cycle II
Curious Sense of	53.0	67.5	85.5
Confidence	54.0	79.0	87.2
Environmental Care	56.0	72.6	84, 1
average	54 , 3	73.0	85.6
Category	enough	Good	Good

In Table 3, an overall average of students' learning outcomes attitude aspect of pre-cycle, the first cycle to the second cycle with both criteria. Comparison of the average results during the research aspects of learning attitude increased from prasiklus to the first cycle: 18.7 from the first cycle to the second cycle: 12.6, overall increases of 31.3.

For a comparison of the learning outcomes for the research aspects of the student's attitude can be seen in Figure 3.

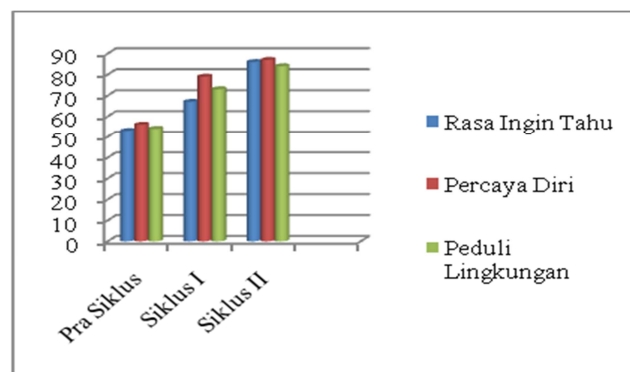


Figure 3. Comparison of Learning Aspects of Attitude For Research

4.1.3. Analysis Aspects of Learning Outcomes Skills For Research

Based on analysis of the students' attitude learning outcome of the pre-cycle, the first cycle and the second cycle can be seen comparing the results achieved during the study in Table 4.

Table 4. Comparison of results Learning Skills during the research aspect.

No	aspect of Skills	average of each Cycle		
		Pre cycle	Cycle I	Cycle II
1.	Explain the Scientific Phenomena	52.0	77.4	86.3
2.	Evaluate and Scientific Research Designing	53.0	76.7	85.8
3.	Interpret Data and Scientific evidence	68.0	75.3	85.2
average		57.7	76.4	85.8
Category		Pretty	Good	Good

Based on data in Table 4, an overall average yield learning aspects of student skills of observation sheet for each cycle, with good criterion. Comparison of average skill aspect of learning outcomes during the study increased from

prasiklus to the first cycle: 18.7, from the first cycle to the second cycle: 9.4 overall increased 28 1.

Comparison of learning outcome aspects of the student's skills for research the highest is the skill to explain scientific phenomena of 86.3. With indicators of observation makes clear identification of a problem with the right hypothesized in worksheets, use the correct scientific concepts in LKS, conveying knowledge gained to others. The lowest skills of interpreting data and scientific evidence with the indicator recording the data properly, making observations / practice well, conveying the right arguments, make decisions with the right is 85.2.

For a clearer comparison of learning skill aspect can be seen in Figure 4.

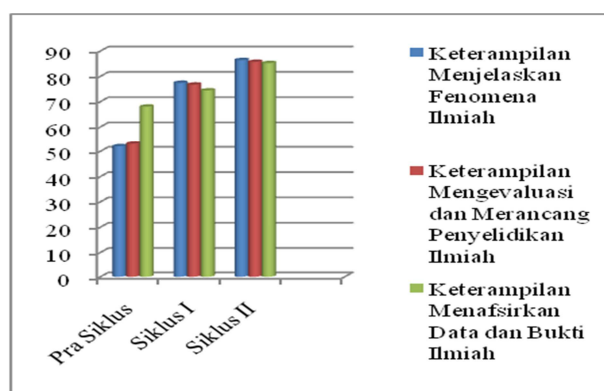


Figure 4. Comparison of Learning Outcomes Research Aspects of Skills During

V. DISCUSSION

Increasing students' science literacy skills of pre-cycle, the first cycle to the second cycle occurs in the following cases:

- When learning takes place, teachers are not straight into the subject to be taught in the day but provide a stimulus to the students according to the stage of guided inquiry model that stimulation (giving stimuli).
- Delivery of material from teachers to students has involved the students to be active in the classroom so that they can build scientific literacy aspect of science students. Then, in the learning process teachers are also seen already invites students to analyze the cause of the problem. The material taught is Ecosystems and environmental pollution, the teacher has given examples of problems that may occur around the student to analyze. One example that may be given is the cause of the imbalance of the ecosystem such as

in the food chain. If one of the components of the food chain or food web is missing, then it will disturb the balance of the ecosystem. A student is said to have literacy to science is that if these students when it is able to apply the concepts or facts learned at school with the natural phenomena that occur in everyday life. Science literacy is important to be mastered by students in relation to how the student can understand the environmental, health, economic and other problems faced by modern society that relies heavily on technology and progress and development of science.

Overall aspects of your scientific literacy of students have increased after using guided inquiry learning model incorporates worksheets in learning.

Guided inquiry learning process teaches students to participate actively in order to discover new knowledge individually with guidance and motivation of teachers. In this lesson students do a lot of investigation using a variety of learning resources that will stimulate students' science literacy skills: the ability to identify, analyze to draw conclusions from a phenomenon that he met so that students will understand the influence of science on the development of technology and its implications for life. Based on the results Vindhy (2016) keterlaksanaan learning model guided inquiry to melatihkan the literacy skills of science, including the excellent category learning by using guided inquiry provides an opportunity for students to continue to develop the potential optimally both in the form of knowledge, attitudes and skills (Toharudin, 2011: 47) ,

Improved learning outcomes aspects of the student's knowledge of the pre-cycle, the first cycle to the second cycle occur for several reasons: a) the students are familiar with the inquiry learning or discovery, b) students who carry out observation / practice can direct experience in the learning process makes it easier to absorb the lesson material with good, and c) the students can understand the lesson well, because the subject matter is close to everyday life. Learning outcome of students' knowledge aspect is also caused by the implementation of guided inquiry learning provides the opportunity for students to develop their ability in learning. This is consistent with the results of research Kurniawati (2016), stating in guided inquiry learning emphasizes a learning process by using scientific measures so that the concept of the material on the ecosystem and environmental pollution can be formed. In addition to the application of learning models of guided inquiry then in class students are more active, through learning by discovery concept; the students are better able to understand the material, so that it can improve learning outcomes.

At the early stage of the implementation of guided inquiry is given a lot of guidance to the students, little by little guidance reduced. As stated by Hudoyono (in Zuriyani, 2010) that in an effort to find some concepts students need guidance even need the help of teachers step by step. Students need help to develop the ability to understand the new knowledge. Although students should try to overcome the difficulties faced by the teachers but help is still needed. Based on the above explanation can be concluded that the guided inquiry learning can improve learning outcomes aspects of knowledge. Blanchard et.al (2010) 'found that guided inquiry learning model is more effective than conventional learning in improving the science knowledge and skills of the students. Yildirim (2012) Inquiry guided causing students to conduct an investigation, the teacher asked a question by formulating hypotheses, designing procedures students themselves to choose the materials needed, analyze the data and make inferences

Improved learning outcomes aspects of science learning outcomes attitude of pre-cycle, the first cycle until the second cycle, encompassing curiosity, self-confidence and increased environmental awareness. Percentage observations highest student attitudes attitude of curiosity based on the observations. This happens because at every meeting there is always a discussion group in learning. This can be evidenced by the results of research: Dewi et al. (2013: 9) indicates that the scientific attitude and the results of the study studying Biology with guided inquiry learning model is better than the group of students who study learning model conventional. Kemudian also delivered by Sudjana (2006: 29), the attitude of someone predictable changes, if someone has had the mastery of knowledge. It can be understood that aspects of knowledge affect each aspect of value for students' attitudes.

Learning outcomes by implementing aspects of the student's skills guided inquiry learning model has increased. This is evident from the section filled by the observer during the observation. Observation of learning outcomes aspects of the student's skills do with three categories: skills assessment explain scientific phenomena indicator marouses identification of problems clearly, making the hypothesis is right in worksheets, using the scientific concept right at LKS, conveying knowledge gained to others, skills to evaluate and designing scientific investigations indicator menyusun experimental design, observation / work practices in a manner that is true, have the ability to respond well in the analysis worksheets, conveying knowledge gained to

other people and the skills to interpret the data and scientific evidence. With the indicator recording the data properly, making observations / practice well, conveying the right arguments, make decisions with the right. Based on the description indicator of the skill aspect, it is reinforced by the results of research Kurniawati et al. (2016) showed that the application of guided inquiry learning model is equipped LKS to improve science process skills and learning achievement in the subject matter of law the basic chemistry class X MIA 4 SMAN 1 Karanganyar 2014/2015 school year peningkatan learning outcomes skills aspect is also evidenced by the results of research Asnawi (2016), the effect of the use of Guided Inquiry learning model with LKS based *Open-ended Question* to competency skills in high school physics learning.

VI. CONCLUSION

Based on the results of a classroom action research carried out by applying the guided inquiry learning model is equipped LKS to improve science literacy and learning outcomes on material biology ecosystems and environmental pollution in SMA 1 Kecamatan Kapur IX, can be summed up as follows: "With the process LKS equipped guided inquiry learning can improve the literacy skills of 9% and the results of studying biology in the aspect of knowledge 58, 1%, 31.6% attitude aspect, the aspect of skill 28.06% on material ecosystem and environmental pollution in SMA 1 Kecamatan Kapur IX.

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