Empirical Analysis KPS and Study Result Waves with Setting Model LC-5E Accompanied LKS Based RGM in SMA

I Ketut Mahardika¹*, Royisi Nur Jamilah¹, Subiki¹

¹University of Jember, Jember, Indonesia

Email: iketutmahardika@unej.ac.id

ABSTRACT

Has analyzed in empirical KPS (skill process of science) and the study results with setting model LC-5E accompanied LKS based RGM (Representation of Picture and Math) on a student of XI MIA 1 SMAN 5 Jember. The purpose of the analysis are to describe the skill process of science and study results waves with setting model LC-5e accompanied LKS based RGM on a student of XI MIA 1 SMAN 5 Jember. This analysis is Action Research (Class). Design of the research uses cycle model hopkins comprising four phase involving planning, action, observation, and reflection. The subject of analysis is student of XI MIA 1 SMAN 5 Jember who will be the act of to solv the problem of low study results. The technique of data collection used in this analysis is interview, observation, documentation, scientific journal, proceeding, and the reference books. The data which there are analyzed and has been described in a qualitative manner. The analysis shows that by using a model LC-5E accompanied LKS based RGM can improve the skill process of science and study result waves grade students of XI MIA 1 SMAN 5 Jember.

INTRODUCTION

Education is conscious effort and planned to realize the atmosphere learning and learning that students actively develop the potential himself to have spiritual power religious, self-control, personality, intelligence, attitude noble, and skills needed himself, the community, the nation and the country. Magfiroh (2014: 2) said that to can realize quality education, so the development of education must be implemented with
standard in four pillars education as has already been recommended by UNESCO that is learning to know, learning to do, learning to be, and learning to live together.

One of the lessons in senior high school is physics. Physics was the result of human activities of knowledge, the idea, and concept which organized about nature about learned through a series of the process of scientific which includes discovery problems, the formulation of problems, the hypothesis, deduction of hypothesis, the testing of hypotheses and acceptance of hypothesis be scientific theory. Of that definition can be concluded that learning activities physics includes two components that cannot be separated namely the process and products. The process is the process of scientific his moves are using procedure or the scientific method. While of the product is knowledge of the fact, the concept, the principle, law, and the theory. Learning physics not only leads in the provision of the concept of the principles of just , but there must be aspects skill and attitude students. In addition, in learning physics did not only lead to the physics just, but also leading to the process physics. Therefore in learning physics should students have just listen explanation teachers but students are required to be able to build knowledge in students and actively for learning.

According to the preliminary observations in SMAN 5 Jember semester odd precisely in October 2016, the activity of learning students who is very low it is proven when learning physics graders XI MIA 1 still tend to passive. In addition, preliminary observations also show their experiences in the laboratory and lab work obtained the result that skill the process of science students XI MIA 1 to supervise the, interpret experiment, concluded learning, communicate the outcome of the experiment, and apply the concept of are low.

Based on the results of observation and interview restricted to teachers field of study in physics public SMAN 5 Jember in October 2016, obtained information that the results of the learn physics students XI MIA 1 in klasikal reached 18.92 % only 7 in 37 students xi mia 1 at the score ≥72 of the score maximum 100. Of these facts show that the results in learning physics class XI MIA 1 are low and not in accordance with KKM which must be achieved students in SMAN 5 Jember namely ≥72. It was because the involvement of students in learning very weak, as a result students had difficulty to represent concepts physics, whether they are real and on a abstract. Learning physics in class XI MIA 1 SMAN 5 Jember tend to be more frequent use of a method of lectures and question and answer. Beside this teachers also in a tutor age have been conducted by teachers in learning. The use of this method make students less are aware of the concept of material described by a friend.

One effort to solve the problem namely by implementing a learning model who makes teaching meaningful, provide the opportunity students active in learning, so as to make study results and skills the process of science students increased. According to Ausubel learn meaningful is a process that connecting new information to concepts relevant that was found in an existing cognitive structure someone (Dahar, 2011: 95). Based on reviews above, model corresponding to applied as one of the solution of the problem in from the classroom XI MIA 1 is model Learning Cycle 5E (LC-5E). According to Purniati 2009, Learning Cycle is learning model who see the ability early students. Learning model was developed of the theory piaget the knowledge early owned students associated with new knowledge obtained students. Learning Cycle 5E is a series of activity phases organized so students over competences to be accomplished in learning physics to the active (Kamidi, 2007: 96). Model Learning Cycle 5E consists
of five stage interconnected one another, namely the generation of interest (engagement), exploration, explanation, elaboration, and evaluation (Lorsbach, in Kamdi, 2007: 97). Election model Learning Cycle 5E because students actively involved in the process of learning so skill the process of science and study results can increase, and learning will be meaningful.

Model Learning Cycle 5E also requires of teaching materials to help students in the process of learning. It was because some condition their experiences in the class when the children given a little work in the implementation of the discussion, 75 % of students still crowded and less be in discussion, so it needs one of the dormitory can help students in use the model Learning Cycle 5e namely sheets of students activity (LKS).

Sheets students activity (LKS) is a guide students who used to engage in the inquiry or problem solving in developing cognitive aspects, affective, and psychomotor (Trianto, 2013: 111). LKS used in learning physics in SMAN 5 Jember contains material by presenting lots of practice about which are generally only show the ability representation verbal and math just, while representation of an image is weak raised. Representation of math are still were very simple that is only in the form of public formulas, the subsidence of formula has not yet been raised, so that students only focused on formulas that is all. If the students faced with questions have been included in the about enrichment, the kids will bewildered because in the questions enrichment it was generally not only using formulas common but relating to a decrease of the recipe had.

One effort to solve the problem necessary LKS containing the problem physics who directs students to observe do and analyze in which includes a representation of pictures and math. Hence LKS used is LKS based representation of an picture and math (LKS based RGM). LKS based representation of an picture and math used to measure skill the process of science students to arrange hypothesis, noted the result of the observation, analyzed data, and conclude. Addition to this measure skill process of science at learning is to do observation, experiment, and communicate. Hence, the application of the kind of classroom Learning Cycle 5e will be integrated with the LKS based rgm is expected to train the process of science skills students and will raise student learning outcomes.

Learning Cycle that is learning model centered on students (student centered). Learning cycle according to the theory learn piaget, namely theoretical learning based constructivism (Ranner,dkk, in Kamdi, 2007:96). Learning Cycle of a series of stages activities organized so that students could master the competences to be achieved in learning to the play an active role. Learning Cycle is one of the learning model constructivis which were originally only consists of three stages, namely: (a) exploration, (b) an introduction of the concept, and (c) the concept. Learning Cycle three stages has developed and improved to 5 the consisting of the stage engagement, (b) exploration, (c) explanation, (d) elaboration, (e) evaluation (Lorsbach, in Wena, 2011:171). The 5 phase of model Learning Cycle define by Lorsbach, as follows:

1. Engagement

   The engagement (interest is generating) early stages of Learning Cycle 5E. At this stage, arousing and teachers trying to develop interest in and curiosity (curiosity) students on a subject of would be taught. This is done by means of asking questions about the process factual in the daily (dealing with topic) subjects. In this case
teachers have to build the links between experience daily on the topic of students will be discussed.

2. Exploration
   The exploration is the second phase of Learning Cycle 5E. At this stage formed clusters of small, then be given the opportunity to cooperate in the small group without learning directly from teachers. In this group students driven to test hypotheses or make new hypothesis, trying to alternative solving with friends a group of, do and record observation and opinion that develops in the discussions. At this stage teachers act as the facilitator and motivator.

3. Explanation
   The explanation is the third stage of Learning Cycle 5E. At this stage requiring teachers get students to explain a concept with the words / thought their own, ask evidence and clarification on explanation students, and listening to in a critical explanation of among students or teacher. The discussion, give the definition and explanation of the concept of discussed by wearing explanation students old as a basis discussion.

4. Elaboration
   The elaboration is the fourth stage of Learning Cycle 5E. In this tahp students apply the concept of skills and has learned in a new situation or different contexts. Thus, students will be can learn in meaningful, having been apply/ apply new concept studying in a new situation through kegiatan-kegiatan as lab work advanced solving problems.

5. Evaluation
   The evaluation is the final stage of Learning Cycle 5E. At this stage teachers could see knowledge or understanding students in applying a new concept. Students can evaluate away by asking questions open and find answers that uses observation, evidence and explanation previously obtained. This evaluation could become teachers as an evaluation of the application of model Learning Cycle 5E is being followed. Evaluation self also knows lack or student progress in learning that has been done.

   According to Fajroh and Dasna (2007: 99-100) excess of model Learning Cycle 5E is as follows:
   a) Expand perspectives and creative teachers in designing learning activities.
   b) Increase motivation study because students actively involved in the process of learning.
   c) Helped develop the scientific attitude students.
   d) Learning became more meaningful.
   The weakness the application of this model is as follows:
   a) The effectiveness of teachers low if it is over matter and measures learning.
   b) Demanding earnestness and creativity teachers in designing and delivering learning.
   c) Management needed a class more well-planned and organized.
   d) Needed time and effort more to create a plan and implement learning.

   Trianto (2009: 222-223) explained that sheets of students activity is a guide students who used to perform the activities of inquiry or problem solving. Sheets of students activity can be a guide to exercise development cognitive aspects and guide to the development of all aspects of learning in the form of a group of fundamental
activities that should be adopted by students to maximize the achievement indicators study results have to travel.

Mahardika (2012: 24-25) explained sheets of students activity is lembar-lembar contains a task to be done school tuition. Sheets of students activity usually a guidance, steps to complete a task. A job instructed in sheets of students activity must be clear that will rise. Duties given to school tuition can be theoretical and duties of practical. Profit the sheets of students activity for teachers is ease teachers in implementing learning, while for students is to make students learn to independently and learn understand and run a the written assignment.

Representation is a configuration (form or arrangement of) could describe, represent or typify something in one way (Goldin, 2002). According to Prain and Waldrip (in Mahardika, 2012: 37) representation is something that represents, describing or symbolizes object or process. Representation is one of the good and developing to infuse understanding the physics (Mahardika, 2013). The use of more than one representation named multirepresentasi. According to Prain and Waldrip (Putri et al., 2012) multirepresentasi also means presented to the same concept with format different, including verbal, math, pictures, and graph.

In physics there are several the format of a representation that can be raised. The formats among other: verbal description, math, pictures and graph (Waldrip and Prain in Mahardika, 2012). A description of each format representation as follows:

a. The format representation of verbal format
   Representation of verbal is one way used to give the definition of a concept. Description of verbal is an explanation of the text of a concept.

b. The format representation of math
   Representation of math needed to resolve the problem quantitative. But its use this representation quantitative there will be determined by the use of representation of success qualitative well. We looked at process that students are not supposed to memorize all mathematic formulas.

c. The format representation of picture
   A concept will be more obvious when we can represented in picture. Picture can help visualize something still in abstract.

d. The format representation of graph
   Explanation length to a concept can be represented in the graphic formats. Hence, the ability to make and read charts is a skill that needed in learning.

RGM is a representation of emphasis on two types of representation namely pictures and math. RGM purpose of giving ease to their students in understanding a concept physics through photographs and through math.

**METHODOLOGY**

This research tend as research survey, with an emphasis on study: 1) book source of reference beginning; 2) description of subjects; 3) learning model commonly used beforehand; 4) research results before relating to the effectiveness of the model LC-5E in their experiences in SMA; 5) research results before relating to the application of LKS based Multirepresentation in learning in SMA; 6) research results before relating to the application of model LC-5E accompanied LKS in increasing skill the process of science (KPS) students; and 7) research results before relating to the application of model LC-5E accompanied LKS in increasing study results of students. Technique data collection used in this analysis is interview, observation, documentation, scientific
journal, prosiding, and the reference books. The data is analyzed and described qualitatively. The subject of study this is a student XI MIA 1 SMAN 5 Jember. Focus on this research is improving KPS and study results waves with setting model LC-5E accompanied LKS based RGM

RESULT AND DISCUSSION
1. Learning physics use LC-5E model
The results of the study related to learning using model LC-5E obtained from scientific journal, article, and reports research shows that model LC-5E effective in learning. Some research results can be seen in table 1 below.

Tabel 1. research results before relating to the effectiveness of the model LC-5E in their experiences in SMA

<table>
<thead>
<tr>
<th>Year</th>
<th>Product and Researcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Students was pleased to applied model learning cycle 5e in learning, activity and study results students increased. M. Khoirul Anwar and Yunus.</td>
</tr>
<tr>
<td>2013</td>
<td>The 5 learning cycle model with inkuiri approach based on ICT (Information &amp; Communication Technology) effective against study results and liveliness student of class XII SMK Pancasila. Cahyo Aji Nugroho, Yuyun Estriyanto, Ngatou Rohman.</td>
</tr>
<tr>
<td>2014</td>
<td>Learning with a model learning cycle 5e effective to improve cognitive ability students knowledge reviewed aspects of study result with the percentage of students who gain value &gt;60 worth 91,10 % with average value 79,68. Hesty Sapitry, Maksun, and Yustina Sri Ekwandari.</td>
</tr>
</tbody>
</table>

2. The use of LKS based Multirepresentation in learning
The results of the research of the previous studies related learning by using lks based multirepresentasi obtained from scientific journal, articles, and reports research shows that lks based multirepresentasi better used in learning. The outcome of several research can be seen in table 2 below.
3. The use of model LC-5E accompanied LKS to increase KPS students

The results of the research of the previous studies related to the use of model LC-5E to increase KPS students obtained from scientific journal, articles, and reports research shows that model LC-5E increase KPS student. The outcome of several research can be seen in table 3 below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Product and Researcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>With the help of LKS based Multirepresentation can lead students in observing, do, and analyze a permasalahn physics, Himmatul Hasanah, I Ketut Mahardika, Babmbang Supriadi.</td>
</tr>
<tr>
<td>2015</td>
<td>LKS Multirepresentation based problem solving ease students to understand information and concept which contained in it. Defy Maharani, Trapsilo Prihandono, Albertus Djoko L.</td>
</tr>
</tbody>
</table>

4. The use of model LC-5E accompanied LKS to increase study result of student

The results of the research of the previous studies related to the use of a model LC-5E to improve result study of students who obtained from scientific journal, articles, and the report on research shows that the model LC-5E improved the study result of students. The outcome of several research can be seen in table 4 below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Product and Researcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>The increase skill the process of science (KPS) students included in the category better after use the model Learning Cycle 5E. Ahmad Purwanto.</td>
</tr>
<tr>
<td>2013</td>
<td>There has been increasing significant study results after using model Learning Cycle 5E accompanied LKS, which is 83% on cycle II. Budi Utami, dkk.</td>
</tr>
</tbody>
</table>

CONCLUSION

Based on analysis of the empirical the research existing concluded that setting model LC-5E accompanied LKS based RGM can increase KPS and study results students. The steps that can be used is conformed to stage on the model LC-5E such as 1) engagement, 2) exploration, 3) explanation, 4) elaboration, and 5) evaluation, where
LKS based RGM can be used in the stage exploration. The use of setting model LC-5E accompanied LKS based RGM will make meaningful learning.

REFERENCES


