**THE IMPLEMENTATION OF LEARNING CYCLE MODEL IN ENERGY TOPIC AT SENIOR HIGH SCHOOL 2 LAMONGAN**

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Abstract

Based on Law Number 20 Year 2003 on National Education System 1 point 1 explains that the ideal learning in Indonesia should be able to make the students play an active role in the process of improving human quality. One of model that can be applied to reach these demands is the learning cycle model (LC). The LC model was first popularized by Robert Karplus. Based on Bybee and colleagues in 1996 in the Sciense Curriculum Improvement Study (SCIS), LC is one of the learning models using constructivism approach. LC consists of 5 syntaxes, namely: (i) engagement, (ii) exploration, explanation, elaboration and evaluation. The purpose of this research is to describe the implementation of LC model in Energy material in SMAN 2 Lamongan. The type of this research is experimental research. The object of this research is determined by using random sampling technique and the research instrument used is the learning activity sheet. The implementation of the LC model is observed by the observer by scoring on the instructional learning sheet and evidenced by the video recording when the learning takes place. The result of this research is almost all the components in the observation sheet of learning implementation. The implementation of learning with LC learning cycle model is very good (LC syntax implemented) at the first meeting and second meeting. The implementation of syntax is shown by the high performance value at the first meeting, which is 88.96% and the second meeting is 89.65%. The results of video analysis also support the performance values ​​provided by the observer.

Keywords: Learning cycle, learning activities, implementation

# **PRELIMINARY**

Based on Law Number 20 Year 2003 on National Education System Article 1 point 1 states that education is a conscious and planned effort to create an atmosphere of learning and learning process so that learners actively develop their potential to have spiritual spiritual strength, self-control, personality, intelligence, noble character, and skills needed him, society, nation and state (Depdiknas, 2003). The law clearly states that ideal learning in Indonesia should enable students to play an active role in the process of improving human quality.

The demand of students to be able to do an active role is also found in Permendikbud Number 22 Year 2016 on Standard of Education And Secondary Process. In the Permendikbud, explained that the principle of learning used is from learners are told to learners to find out (demands students to play an active role) and from a textual approach to the process as a strengthening the use of scientific approach (Kemendikbud, 2016).

In addition to students required to be able to play an active role in learning, students must also master the characteristics of the skills of the 21st century society. Characteristics of community skills The 21st century published by Partnership of 21st Century Skill (PCS) in 2008 identifies that students in the 21st Century should be able to master critical thinking, problem solving and communication skills (Basuki, 2012).

Based on the interview that has been done to some teachers of Physics at SMAN 2 Lamongan about the learning process given to the students, got the fact that Physics learning in high school (SMA) using teacher-centered learning model. The Physics Teacher at SMAN 2 Lamongan clearly says that the students just sit and listen to the explanation from the teacher during the learning process. Based on these facts, it can be concluded that students in SMAN 2 Lamongan role passively in learning physics. This is in contrast to the demands that students must have in this era of globalization.

Based on the background that has been presented, Researchers believe that one model that can make students play an active role in learning and can meet the demands of education in Indonesia is the Learning cycle 5E model. Of course the learning cycle model should be well implemented. Well here means all LC model syntax should be implemented by the teacher. Based on this background, Researchers feel the need to describe the implementation of learning with Learning Cycle model at SMAN 2 Lamongan on Energy topic.

Learning cycle model (LC) was first popularized by Robert Karplus. Based on Bybee and colleagues in 1996 in the Sciense Curriculum Improvement Study (SCIS), LC is one of the learning models using constructivism approach. LC consists of 5 syntaxes, namely: (i) engagement (ii) exploration (iii) explanation (iv) elaboration (v) evaluation (Wena, 2011). These five syntax are often called 5E. Here is the syntax explanation:

1. Engagement Syntax

In this syntax, teachers try to inflame and foster interest in learning learners by making learners have a sense ingi know (curiocity) about the concept to be studied. This can be accomplished by asking questions about phenomena in real life (in accordance with the concepts to be studied). It is expected that the way it can make learners provide feedback in the form of response / answer. Students' answers are used as a reference by teachers to know their initial knowledge about the subject matter to be studied.

1. Exploration Syntax

In this syntax, small groups are formed heterogeneously. Then learners work together in groups directly without any explanation of the material being studied. Activities undertaken by learners is to test the hypothesis or create a new hypothesis, try alternative solutions with a group of friends, conduct and record experiences and ideas or opinions developed in the discussion. The teacher acts as a facilitator and motivator in this syntax.

1. Explanation Syntax

The purpose of this syntax is to refine and develop the concepts that have been gained by learners on the previous syntax. In this syntax, teachers evoke the ability of learners to be able to explain a concept with a sentence based on their own thinking, asking for evidence and explanation for their explanation. In this syntax learners find the terms of the concepts studied.

1. Elaboration Syntax

In the excavation syntax, learners apply the concepts and skills that have been acquired into other phenomena. If this syntax can be well designed by the teacher, then the motivation to learn learners will be able to increase. Increased motivation learners are believed to be able to encourage increased learning outcomes.

1. Evaluation Syntax

In the evaluation syntax, teachers are expected to review the understanding of learners as a result of the learning process. Learners are also expected to be able to carry out self-evaluation and provide questions about things they are confused or things they want to know and look for answers. Evaluation results can be used as a reference by the teacher as an evaluation of the process of applying the LC model.

The learning process using LC is a learning model that focuses on the learner. Learners play an active role in learning to be able to find and understand the concept of learning materials that are taught. The LC model is supported by several learning theories, namely the cognitive development theory proposed by Piaget, Bruner's theory of learning, the theory of constructivism learning, and Ausubel learning theory.

Here are the activities of teachers and learners on LC 5E syntax:

Table 1.1 Activities in LC model

|  |  |  |
| --- | --- | --- |
| No | LC syntax | Activities |
| Teacher | Student |
| 1 | Engage-ment | Bring up interest and curiosity | Developing interest / curiosity about the subject matter / topic |
| Asking questions about real life phenomena (related to the topic) | Responding to questions asked by the teacher |
| Associate the topic discussed with the learners experience. Helping learners to remember their daily experiences and show their relation to the topic of study being discussed | Trying to remember everyday experiences and connecting with the topic of learning being discussed |
| 2 | Explora-tion | Forming groups heterogeneously, giving the opportunity to be able to work together in small groups them | Form groups and work together in groups to find a concept |
| The teacher acts as a facilitator | Make a new prediciton |
| Encourage learners to perform hypothesis testing | Conducting hypothesis testing |
| 3 | Explana-tion | Encourage learners to explain concepts with their own sentences | Trying to give an explanation of the found concepts |
| Request evidence and explanation of the learner's explanation | Provide explanations based on observations and notes |
| Listen critically between students or teachers | Provide an opinion to support the proposed concept |
| 4 | Elabora-tion | Remind the learners of alternative explanations and consider data / evidence as they explore new situations | Apply concepts and skills in new situations |
| Encourage and facilitate learners to apply concepts / skills in new / other settings | Completed the new settings using the concepts that have been obtained in the previous syntax |
| 5 |  Evalua-tion | Test and evaluate the knowledge or understanding of learners in terms of application of new concepts | Evaluate the concepts / lessons learned |
| Encourage learners to conduct self-evaluation | Taking further conclusions about the learning situation it does |
| Encourage learners to understand the shortcomings / advantages in learning activities | View and analyze the shortcomings / advantages in learning activities |

According to the theory of cognitive development, learners perceive their new knowledge based on previously possessed knowledge. Bruner's theory of learning focuses on the process of learning by discovery. Bruner conveyed that with learners discovering their own material that must be understood, it will make the material last longer. The theory of learning contructivism explains that learning is the process of acquiring knowledge and capabilities obtained directly by learners. Ausubel's learning theory conveys that learners associate information or knowledge that they have before with the new knowledge they receive. This connective process is through meaningful learning.

**METHOD**

The type of this research is experimental research. The object of this research was determined using random sampling technique. The location of this research is in SMA Negeri 2 Lamongan (SMADA). SMADA is located on Jl. Veteran Number 01, Banjarmendalan, Lamongan Sub-district, Lamongan Regency, East Java (62212). The data were collected in March 2018 (academic year 2017/2018).

Learning tools in this research are syllabus, learning implementation plan (RPP), student work sheet (LKPD) and Handout. All learning tools are validated by 2 expert lecturers theoretically first before use. The research instrument used is the learning activity sheet. The research instrument was validated by two expert lecturers in the field prior to use.

In this study, researchers will analyze the value of teacher performance when providing learning using learning cycle model and then describe it. The performance appraisals include syntax execution, content content presentation, student enthusiasm, the demands of planned learning steps, time conformity and language usage. The performance appraisal can be calculated using the formula:

Performance value = $\frac{the number of scores earned}{maximum number of scores}$ x 100%

(Purwanto, et al., 2008)

Performance value criteria:

81 % - 100 % = less

66 % – 80 % = fair

56 % – 65 % = good

≤ 56 % = very well

The performance scores that obtained will also automatically indicate the category of LC syntax execution because in providing the observer performance value based on the learning instruction sheet where there are LC syntaxes in the assessment component.

**RESULTS AND DISCUSSION**

**Result**

The results of this study are as follows:

Table 3.1 The Implementation of First Meeting Learning

|  |  |  |  |
| --- | --- | --- | --- |
| No | Components (description) | Score | Analysis by Researchers |
| In hours, minutes and seconds to | Conclusion |
| Preliminary activity |
| A | Engagement |
| 1 | Teachers prepare students psychically and physically to follow the learning process | 4 | 00.18-01.30 | It's done |
| 2 | Awaken interest and curiosity. | 5 | 01.31-02.20 | It's done |
| 3 | Asking questions about videos that are expected to arouse learners' interest in learning | 5 | 02.21-02.43 | It's done |
| 4 | Equate the initial perception to learners | 5 | 02.44-03.34 | It's done |
| 5 | Delivering learning goals | 5 | 03.35-05.13 | It's done |
| Core activities |
| B | Exploration  |
| 1 | Forming groups, giving opportunities to work together in small groups independently | 4 | 05.14-39.57 | It's done |
| 2 | The teacher guides the experiments being performed by each group. | 4 | 05.14-39.57 | It's done |
| 3 | The teacher acts as a facilitator. | 4 | 05.14-39.57 | It's done |
| 4 | Teachers facilitate the interaction between learners as well as between learners with teachers, the environment, and other learning resources | 4 | 05.14-39.57 | It's done |
| 5 | The teacher gives the opportunity to think, analyze, solve problems, and act without fear | 5 | 05.14-39.57 | It's done |
| C | Explanation |
| 1 | Teachers encourage learners to explain concepts with their own sentences. | 4 | 39.58-47.33 | It's done |
| 2 | Teachers provide positive feedback and reinforcement in the form of rewards | 4 | 47.35-47.40 | It's done |
| 3 | The teacher listens critically to the learner or teacher. | 4 | 39.58-47.33 | It's done |
| 4 | Teachers facilitate the interaction between learners | 4 | 47.53-54.41 | It's done |
| D | Elaboration |
| 1 | Master reminds learners of the concepts they have gained | 5 | 54.42-56.45 | It's done |
| 2 | The teacher provides development exercises to apply the concept in new conditions | 5 | 56.46-01.15.47 | It's done |
| 3 | Teachers encourage and facilitate learners to apply concepts / skills in new / other settings. | 4 | 56.46-01.15.47 | It's done |
| 4 | Teachers provide motivation to learners who are less or have not actively participated | 4 | 01.05.18-01.05.36 | It's done |
| Closing activity |
| E | Evaluation |
| 1 | Teachers along with learners and / or themselves make summaries / conclusions | 2 | - | Not done |
| 2 | Teachers provide feedback on learning processes and outcomes | 5 | 01.18.51-01.19.14 | It's done |
| 3 | Teachers function as resource persons and facilitators in answering learners' questions that face difficulties by using standard and correct language | 5 | 01.18.42-01.18.50 | It's done |
| 4 | Teachers facilitate reflection learners to gain the learning experience that has been done | 5 | 01.19.42-01.31.10 | It's done |
| 5 | The teacher presents the lesson plan at the next meeting | 5 | 01.19.22-01.19.32 | It's done |
| 6 | Teachers perform assessment and / or reflection on activities that have been implemented consistently and programmed | 4 | 01.19.42-01.31.10 | It's done |

From the table, it can be seen that almost all components in the observation sheet implementation of learning implemented. There is one component that does not occur that is in the evaluation stage Teacher does not make summary / conclusions lesson. Implementation of learning at the first meeting to get the performance value of 88.96%. These performance values fall into very good criteria.

Table 3.2 Implementation of Learning at the Second Meeting

|  |  |  |  |
| --- | --- | --- | --- |
| No | Components (description) | Score | Analysis by Researchers |
| In hours, minutes and seconds to | Conclusion |
| Preliminary activities |
| A | Engagement |
| 1 | Teachers prepare students psychically and physically to follow the learning process | 5 | 00.15-00.59 | It's done |
| 2 | Awaken interest and curiosity. | 4 | 01.00-01.44 | It's done |
| 3 | Asking questions about videos that are expected to arouse learners' interest in learning | 5 | 01.46-02.00 | It's done |
| 4 | Equate the initial perception to learners | 5 | 02.01-03.27 | It's done |
| 5 | Delivering learning goals | 5 | 03.28-04.19 | It's done |
| Core Activities |
| B | Exploration  |
| 1 | Forming groups, giving opportunities to work together in small groups independently | 5 | 04.28-48.37 | It's done |
| 2 | The teacher guides the experiments being performed by each group. | 5 | 04.28-48.37 | It's done |
| 3 | The teacher acts as a facilitator. | 5 | 04.28-48.37 | It's done |
| 4 | Teachers facilitate the interaction between learners as well as between learners with teachers, the environment, and other learning resources | 5 | 04.28-48.37 | It's done |
| 5 | The teacher gives the opportunity to think, analyze, solve problems, and act without fear | 5 | 04.28-48.37 | It's done |
| C |  Explanation |
| 1 | Teachers encourage learners to explain concepts with their own sentences.Teachers provide positive feedback and reinforcement in the form of rewards | 5 | 04.38-54.31 | It's done |
| 55.45-57.09 |
| 57.15-01.03.02 |
| 2 | Teachers encourage learners to explain concepts with their own sentences.Teachers provide positive feedback and reinforcement in the form of rewards | 5 | 57.10-57.14 | It's done |
| 01.06.26-01.06.31 |
| 3 | The teacher listens critically to the learner or teacher. | 4 | 04.38- 54.31 | It's done |
| 55.45-57.09 |
| 57.15-01.03.02 |
| 4 | Teachers facilitate the interaction between learners | 4 | 54.32-55.45 | It's done |
| 01.04.15-01.06.15 |
| D | Elaboration |
| 1 | Master reminds learners of the concepts they have gained | 5 | 01.05.34-01.06.20 | It's done |
| 2 | The teacher provides development exercises to apply the concept in new conditions | 5 | 01.06.35-01.09.45 | It's done |
| 3 | Teachers encourage and facilitate learners to apply concepts / skills in new / other settings. | 4 | 01.06.35-01.09.45 | It's done |
| 4 | Teachers provide motivation to learners who are less or have not actively participated | 4 | 01..09.46-01.11.07 | It's done |
| Closing activities |
| E | Evaluation |
| 1 | Teachers along with learners and / or themselves make summaries / conclusions | 4 | 01.11.27-01.12.19 | It's done |
| 2 | Teachers provide feedback on learning processes and outcomes | 4 | 01.11.07-01.11.25 | It's done |
| 3 | Teachers function as resource persons and facilitators in answering learners' questions that face difficulties by using standard and correct language | 5 | 01.14.00-01.14.15 | It's done |
| 4 | Teachers facilitate reflection learners to gain the learning experience that has been done | 5 | 01.14.16-01.23.51 | It's done |
| 5 | The teacher presents the lesson plan at the next meeting | 2 | - | Not doe |
| 6 | Teachers perform assessment and / or reflection on activities that have been implemented consistently and programmed | 4 | 01.14.16-01.23.51 |  It's done |

From Table 3.2, it can be seen that most of the components described and used as a reference in observation activities have been implemented in learning activities. There is only one component that does not happen that the Researcher did not submit the lesson plan at the next meeting. Implementation of learning at the second meeting get a performance value of 89.65%. The performance values are included in the criteria very well.

**Discussion**

In the first lesson, the teacher gives some questions that check the concentration of learners in the syntax of involvement, whereas in the second meeting, the teacher gives a game. Both activities are as a way to prepare students psychically and physically to follow the learning process. After that the teacher showed a video about the pogo stick first encounter and a video about the roller coaster at the second meeting. The video viewing is an important activity in the syntax of engagement in the hope that learners can be motivated to learn. The first encounter constraint on this syntax is that learners do not know the pogo stick so Teachers need to notify learners after the video is shown to prevent students' inferiority perceptions. While the obstacle at the second meeting at this stage is there are some learners who do not concentrate so that the Teacher reminds the students to concentrate.

In the investigation syntax the learners work with their respective groups and carry out experiments and fill LKPD. Constraints on the syntax of inquiry at the first meeting are slow learners gathering with their groups so that Teachers should remind to speed up gathering with their respective groups. While the barriers to this syntax in the second meeting were Teacher overwhelmed as a facilitator in each group (when the teacher provides guidance to one of the groups, another group asks a question indicating that the group needs Teacher as a facilitator). In order to overcome these obstacles, Master accelerated the relief activities to one of the groups and immediately rushed to the group in need of help. In addition, Master also asks other groups to be patient and read the handouts more carefully.

In the explanation syntax, one group comes forward to the class and presents the results of their discussion, while the other group responds. There are no significant obstacles in this syntax in the first meeting. But at the second meeting, there were obstacles where too many groups wanted to present their experimental results. If all groups come to the front of the class to present their experimental results, it will result in the duration of learning to be delayed and there will be a syntax that does not work because the lesson has run out. To overcome these obstacles, Master asked the group representatives to raise their hands after being given the signal by Master. The fastest group representatives raised their hands after the cue was given the right group to present the results of their experiment in front of the class.

In the excavation syntax, learners work on the elaboration points in the LKPD then discussed together. There are no significant constraints in this syntax in the first encounter. But at the second meeting there were two groups who wanted to come to the front of the class to explain the results of their elaboration points, while all the items in the LKPD were answered by another group. To overcome these obstacles then the Teacher provides additional elaboration to the two groups and also be considered by all learners in one class.

In the evaluation syntax, students do post-test to be able to know their HOTS ability after being given treatment. Obstacles in this syntax in the first and second meetings are not conducive and crowded learners. This is because learners are tired of the activities they get. Teachers overcome these obstacles by reminding the learners not to crowd and doing their post-test honestly (not cheating).

**CONCLUTION**

Based on the research that has been done, it can be concluded that the implementation of learning with learning cycle model (LC) performed very well in the first meeting with the performance value of 88.96% and also in the second meeting with the performance value of 89.65%. The results of video analysis by the author also supports the performance values provided by the observer

**SUGGESTION**

After the author completes the research, there are some inputs that can be observed by the reader and applied in further research. The suggestions are:

1. Teachers should be familiar with learners with certain norms limit when learning by using LC model takes place, because if learners are familiar with the teacher, then learners will not hesitate to convey their learning difficulties and ask for help teachers when in the learning process they feel confusion.

2. Teachers should be able to control students who tend to often create a rowdy atmosphere in the classroom, because if the learners can be controlled, then the learning atmosphere will be more conducive.

3. Ensuring LKPD used to help students perform activities in accordance with the syntax on the LC.

4. Preparing learners before learning with LC model takes place.

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