



The influence of Learning Learning Cycle Model against the motivation of learning and critical thinking skills of students on the material of the human digestive system

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Abstract

This research aims to know the influence of motivation towards Learning Cycle of learning and critical thinking skills of students on the material of the human digestive system in SMP Negeri 03 Jekulo. The sample used is grade VIII VIII C and D taken with the technique of convenience sampling and research design a non-randomized control group pretest-posttest design. Data obtained in the form of motivation and critical thinking skills as well as the response of teachers and students towards learning Learning Cycle model. Data analysis using SPSS 16.0. The research results obtained studying motivations of students after learning Learning Cycle has increased from 76.87 with higher category be the category with very tinggi 84.67. Results the average critical thinking skills has increased from 76.34 with critical categories into classes with 82.11 wants a category of highly critical. The t-test based on posttest showed thitung > 11.628 from ttabel 2.073 which means there is a significant difference. The response of the students towards the Learning Cycle shows interest because of the interesting activities and serves the appropriate issues with everyday life. The teacher gave a positive response, namely students became active in learning, so that students acquire the knowledge of the concept of direct experience of the menjadikan pengetahuanya longer remember. The conclusions of this research are the Learning Cycle model provides a positive influence motivation towards learning and critical thinking skills on the material of the human digestive system in SMP Negeri 3 jekulo.

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INTRODUCTION

One of the must-have skills on a 21st-century is the critical thinking skills. Critical thinking skills train students to make decisions from a wide point of view carefully, meticulously, and logical. In fact, in many schools biology learning has not been oriented towards habituation and improvement of skills in critical thinking skills, but still focuses on low level cognitive learning outcomes. Fembriani *et al.* (2015) States that 50% of the school had yet to develop a learning device for improving critical thinking skills that correspond to indicators.

Based on the results of interviews with teachers of biology SMP Negeri 3 Jekulo Kudus that the implementation of learning biology had yet to develop critical thinking skills of students, but still operates on a low level cognitive learning results. And there is an indication of student learning motivation are low. That is because the learning methods used by the majority of teachers using learning model of lectures. The learning model is used because it has a time efficiency and can explain the concept of the material. But not all material can be taught with the model of the Learning Material, such as the digestive system which requires the observation in his education. It also results in less-trained students develop critical thinking skills and apply the concepts learned in school to the real world. In the initial observation, the average level of motivation of students turned out to be quite high at 76,175 which was in the high category.

According to Yulaikah (2015) 21st-century biology learning should use a learning model that can improve students' thinking skills, so students can keep up with the development of the world based on science and technology. To overcome these problems, we need a learning model that can improve students' critical thinking skills. One of them is the Learning cycle learning model. Learning cycle is a research-based learning model that can help students explore concepts in science and help teachers to plan learning that can facilitate understanding of concepts (Duran *et al* 2011).

Sadi and Cakiroglu (2014) in their study suggested that learning using the learning model can improve students' cognitive and motivation. Novianti (2014) argued that Learning cycles can explore students 'critical thinking skills, according to the results of their research that showed a positive influence on students' critical thinking skills.

The advantages of Learning cycle 5E include stimulating students in shaping learning experiences, developing concepts, providing activities so that students can identify their concepts so that they can facilitate changes in concepts, provide opportunities for teachers to introduce concepts and skills to experience new experiences to assess understanding and peace (Bybee, 2006).

Based on the description above we need a learning model that can develop critical thinking skills and can increase motivation, one of which is the Learning Cycle. So it is necessary to do research on "The Effect of Learning Cycle Learning Model on Learning Motivation and Critical Thinking Skills of Students".

RESEARCH METHODS

This research was conducted in SMP Negeri 3 Jekulo in the 2016/2017 academic year odd semester. The population in this study were all class VIII students. The samples taken

in this study were class VIII C as the control class and class VIII D as the experimental class. Sampling is done by convenience sampling technique. The study design used is a non-randomized control group pretest-posttest design. Free variables in the research is the application of the Learning Cycle on a class of experiments and models of learning learning direct and cooperative on the control class. While the Variables bound to the current study is the motivation of student learning and critical thinking skills. The data is taken in the form of score obtained through learning motivation motivational scale study, the results of the critical thinking skills of critical thinking skills test results and observations, the answer to the question form responses to students and teachers against the model learning.

RESULTS AND DISCUSSION

This research reveals the influence of the application of learning Learning cycle model against the learning motivation of students and critical thinking skills on the digestive system. The results obtained in the form of score the motivation of learning acquired through learning motivation scale before and after learning the results of learning, critical thinking skills test results obtained from critical thinking skills and results of observation, answers question form responses to students and teachers towards learning model. Following are the results of the research that has been done.

The results of the analysis of the learning motivation of students

Table 1 results of the analysis of the average score learning motivation of students

No.	Class	The average Score initial motivation	Criteria	The average Score the final Motivation	Criteria
1	Control	75, 48	High	78, 63	High
2	Exsperimen	76, 87	High	84, 67	Very high

Based on Table 1 the increase in the average motivation score occurred in both classes after the learning process was done but in the control class the learning motivation was still in the high category while in the experimental class it was in the very high category. In the experimental class, there was a significant increase in motivation scores and included in the very high category. This is because by using the learning model Learning cycle students learn through experience directly so that the knowledge gained is long remembered and makes it long-term information.

Processing of this information is in accordance with Gagne's information processing theory. Information processing is based on how to obtain information that utilizes the five senses to gain experience. The experience is processed in short-term memory that can be processed into the true information needed. Short-term memories will be easily forgotten, but if they are connected with other information and obtained from direct experience, information will be stored permanently. Permanent storage is called long-term memory (Seifert, 2012).

Analysis of indicators of motivation

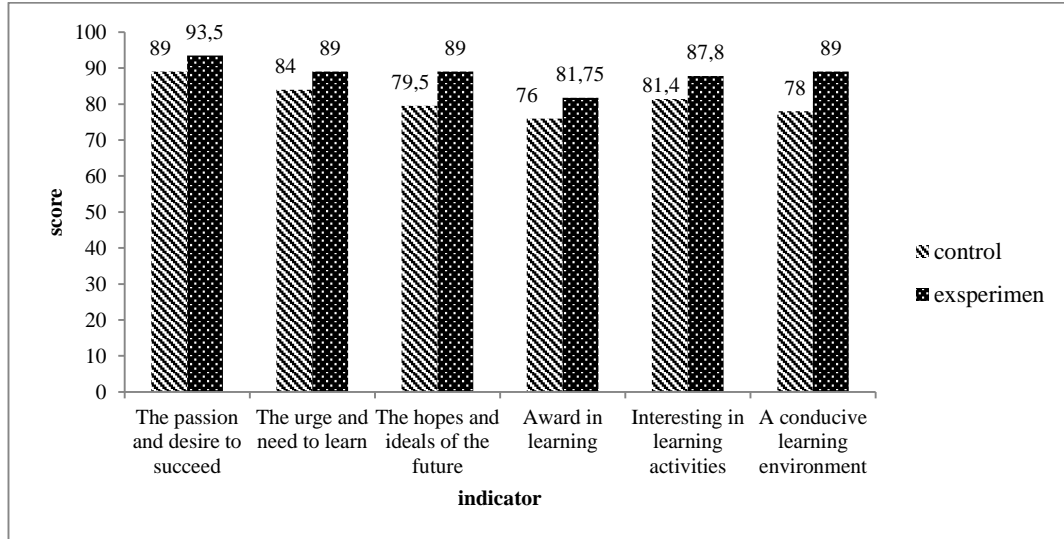


Figure 1 Average analysis results Posttest Indicator Motivation

Based on Figure 1 indicator is the passion and desire to succeed both classes gets a very high category. Second grade got a very high score because it fits with the exploration phase where students make predictions through practical, observation and discussion. Through these activities make students become more active and more enthusiastic in following the instruction. This is supported by Asiyah's (2013) opinion on the application of Learning Cycles with Macromedia flash assisted with LKS capable of improving the quality of student learning.

Indicators of encouragement and need for learning the control class get a high category and the experimental class gets a very high category. Scores in the experimental class are higher because in the engagement phase students are encouraged to recall the knowledge they have so students are motivated to take part in learning. According to Suprihati (2015) efforts to improve student learning motivation are to clarify the goals to be achieved, generate motivation, create a fun atmosphere, use a variety of interesting presentation methods, give praise, give an assessment, give comments on the results of student work, create competition and cooperation.

Based on the analysis of indicators of future expectations and ideals of the control class, the high category, and the experimental class is very high. This indicator is included in the evaluation phase of the Learning cycle model. in this phase can be known students have reached the learning objectives and who have not reached the learning objectives. The experimental class gets a very high category because students are taught to solve problems and make conclusions. In accordance with Perta's opinion (2017), Learning cycles can improve students' reasoning skills, stage evaluation teaches students to check the understanding of concepts and use reasoning indicators to know the advantages and disadvantages of learning.

In general, the award indicator in learning has a significant difference in value, but both classes get the same category, namely high. This indicator is included in the elaboration phase where students are asked to solve problems and convey the results of their solutions.

According to Nugraheni (2017), Learning cycle 5E supports the development of learning motivation, an introduction of appropriate learning strategies, and improvement of students' metacognitive abilities, especially through the phases of an engagement, exploration, and evaluation, making the experimental class have high intrapersonal abilities.

The indicator of interesting activities in learning, the control class gets a high category and the experimental class gets a very high category. This indicator is in accordance with the exploration phase and elaboration phase where students will make predictions and solve problems with practical activities and article discussions. The experimental class gets a high category because with interesting learning motivates students to take part in learning that makes students more active. Learning cycle increases student learning motivation because students are actively involved in learning activities (Widhy, 2012).

The last indicator of learning motivation is the learning environment that is conducive to the control class obtaining a high category and the experimental class obtaining a very high category. This indicator can be seen in the explanation phase where students are asked to deliver the results of the discussion and practicum. Here students work together and help each other in discussions. In accordance with Sari's opinion (2013), the application of the 5E Learning cycle learning model complete with handouts can increase the motivation of achievement and learning outcomes of chemical solubility and solubility products. In the application of Learning cycle, 5E with handouts students can control themselves and remain serious in groups when learning, so that the classroom atmosphere remains conducive and creates a comfortable atmosphere for themselves and other friends so as to increase motivation and achievement.

Based on the explanation above the indicative value of the experiment class motivation is on average higher because by using the Learning cycle students are more enthusiastic about discussing and asking questions to friends and teachers because students are given problems that are appropriate to everyday life (through articles) and presented the digestive system video so students are more enthusiastic in learning. Besides that, in the experimental class, the class conditions are more conducive and able to work together well in practicum and discussion. Pleasant learning atmosphere and in accordance with the procedures in learning make students feel easier to understand the concept as well as teachers easily manage the class.

This is due to the learning process of the digestive system with the Learning cycle model implementing active learning activities so that students' curiosity increases and students' knowledge is gained from direct experience so it will be long remembered. This is in accordance with the Gagne information processing theory that in learning occurs the process of receiving information, to then be processed so as to produce output in the form of learning outcomes (Rehalat, 2014).

Motivation is very important to encourage students to follow learning activities. Motivation can be formed from within (intrinsic) and students from outside of the student (extrinsic). Intrinsic motivation is a State that comes from inside the students encouraged him to learn. Likes the feeling of the material and its needs to the materials for example for future needs of the student in question included in intrinsic learning motivation. With the goal or desire to succeed that is found in yourself students will make students a passion for learning in order to get the results and achievements of the study.

Extrinsic motivation is a drive to achieve goals that come from outside yourself students. The awards aspect in learning, interesting in learning activities and a conducive

environment including on extrinsic motivation. Facilities in schools as well as teaching tools, projectors, books etc, can improve the learning motivation of students. The environment at school or at home can affect a student's learning motivation. How to educate the parents or family environment that provides attention, reinforcement, and awards will make the children more excitement in learning activities. Environment friends who bring positive influence will be able to improve the learning motivation of students, instead of bringing friends environment negative influences will make students ignore his studies and tend to steer the behaviour deviant. The role of the teacher in the learning process in school can determine the learning motivation of students. The efforts of teachers in teaching students such as using methods or media interest will arouse the learning motivation of students. Hamza (2008) stated the existence of elements that have a major role in a person's learning motivation one of the factors, namely the existence of a conducive learning environment and can be derived from the family environment.

Based on the discussion above Learning Cycle provide positive influence towards the motivation to learn. It can be seen the number of students class experiments of their learning motivation category rising as much as 15 students, compared kelaskontrol only 3 students.

The results of the analysis of the value of critical thinking skills

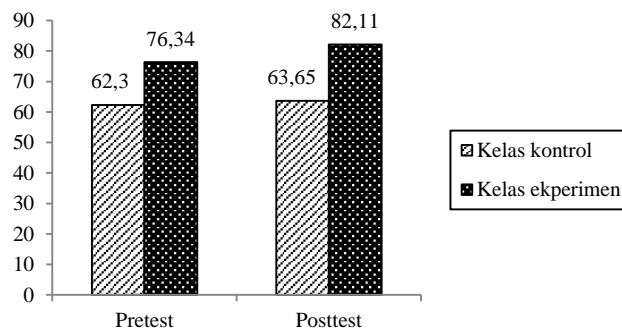


Figure 2 Average results of Pretest and Posttest critical thinking skills

Based on the picture above the average value of pretest and posttest grade wants experienced a significant increase. These results are reinforced by the t-test to determine the effect of the Learning cycle on critical thinking skills in the digestive system learning. The calculation of the posttest results using the t-test at the 95% confidence level. Based on the results of the calculation obtained tcount 11,628 and ttable 2, 073 then $11,628 > 2,073$. Thus H_0 is rejected and H_1 is accepted.

This shows that there are differences in the results of critical thinking skills before and after learning in the experimental class. So that it can be concluded that critical thinking skills after learning cycle learning are higher than before learning.

This is because in learning Learning cycle students are actively involved in learning. Learning cycle models of students are invited to practice, discussions and other activities that develop knowledge and curiosity of students. One learning model that can activate students is to use Learning cycle learning. This is in accordance with Murdhiyah (2014) Learning cycle

learning is suitable for sharpening students' critical thinking skills because it requires students to play an active role in seeking their own knowledge.

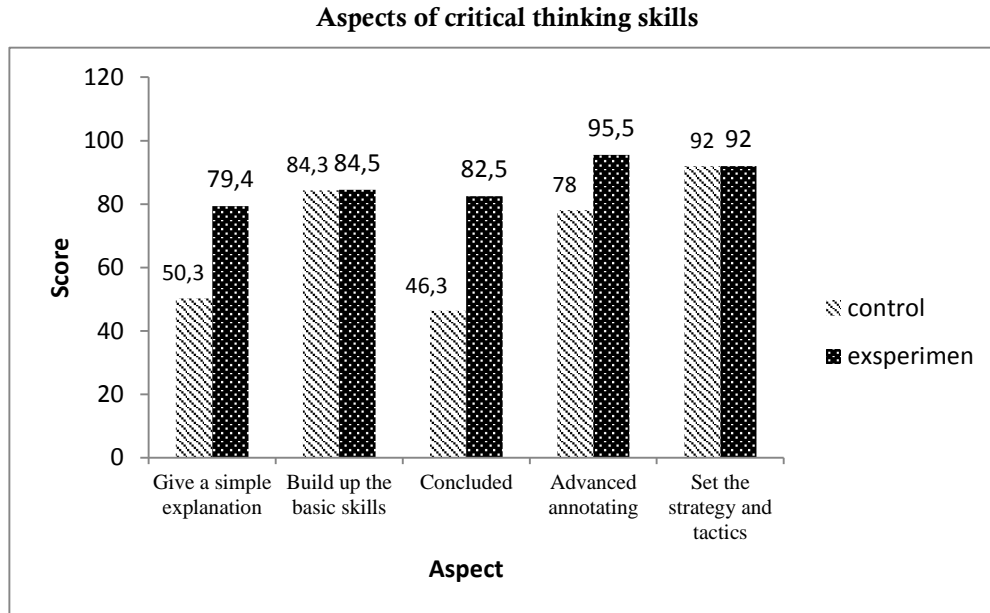


Figure 3 Results of Average Analysis of Aspect Score in Critical Thinking Skills

Based on Figure 3 of the first aspect, giving a simple explanation of the experimental class has a higher average value than the experimental class control class gets a critical category. While the control class of the control class is less critical. The average aspect gives a simple explanation to the higher experimental class because students are trained to formulate problems, analyze, ask questions and answer activities in LDS and LKS. This is in accordance with the opinion of Latifa (2017) the explanation phase in the Learning cycle students are required to convey and analyze opinions by identifying certain concepts. In addition, the explanation phase also increases motivation on indicators of a conducive learning environment because students are taught collaboration and express opinions in discussions.

The second aspect is the aspect of building the skills of the two classes that get a very critical category. The experimental class score is superior to the control class but only has a small difference. In this aspect, students are asked to hone their skills using practical tools. In addition, students are asked to consider the credibility of a source to provide the right reasons and also observe and consider the results of observations by noting the desired things in concluding. This aspect is in accordance with the exploration phase in the Learning Cycle, which requires students to make predictions through practicum. Scores on this aspect are not much different because in the control class and experiment are equally trained using practical tools. This phase is also in accordance with the motivational indicators of interesting activities because students carry out practicums and indicators of desire and desire. The exploration phase can bring up critical thinking skills of analysis and inference (interpretation) and get elements to make conclusions, guesses, and hypotheses (Hardinata, 2015).

In general, the aspect of making conclusions has a significant difference in scores between the control class and the experimental class. In the experimental class, the category

was very critical, while the control class received a less critical category. The control class score is low because students have not been able to make deduction or induction and consider the results of deduction or induction. Based on the learning model in the experimental class, students are directed to make conclusions from the results of the practicum and in the discussion activities. While in the control class only trained with discussion activities, so that students are only trained to make judgments and not trained to conclude. This aspect is in accordance with the elaboration phase which requires students to make predictions and solve problems. It is trained through a discussion of articles about the digestive system. This phase also increases interesting activity motivation indicators and rewards in learning. According to Santosa (2010) through drawing conclusions, students will be better able to improve their critical thinking skills.

Based on the analysis of aspects make further explanation the experimental class scores with very critical categories and the control class with the critical category. This aspect is in accordance with the phase of explanation where students interpret the results of experiments and discussions and train students to solve problems. Motivational indicators that are in line with this phase are a conducive learning environment. These activities are found in the LDS and LKS of the experimental class. So that the experimental class scored higher than the control class. Nugraheni (2017) Learning cycle increases the aspect of further explanation through the explanation phase as evidenced by students can explain the results of previous observations, convey ideas and connect variables obtained from exploration activities.

The last aspect is to set the strategy and tactics of the experimental class and the control gets the same score in the very critical category. In both classes got the same value because when viewed from the activities carried out, both the experimental and control classes did not do activities that were much different, namely there were discussions and practicum. In this aspect, students decide on actions by considering solutions to the problems they are facing based on the information they have and daily experience. This is in accordance with the phase of elaboration and exploration where students are trained to use tools, make predictions and solve problems. Motivational indicators that are in accordance with this aspect are indicators of interesting activities and rewards in learning. Yotiana (2016) states that the ability to think critically about aspects of managing strategies and tactics can be developed through learning that raises problems first to find concepts.

The results of this research is also supported by the theory learned Bruner. Bruner's theory of learning known as 3 stages of yairu (1) Admission: entry of the perceptions and experiences of pengetahaun, (2) changes of perception and transformation: new knowledge into a form which has a meaning, (3) the eligibility Test: activities created to measure the old knowledge of statutes already owned before. Bruner also looked at internal power as motivation in the learning process. According to Bruner one way of motivating students with knowledge of the findings (Seifert 2012).

Based on observational learning models keterlaksanaan sheets Learning Cycle, phases of learning Learning Cycle would operate properly. Engagement in Learning Cycle 5E can involve students in filing against predictions of phenomena which will be studied. In the first phase of the engagement of teachers generate interest and identify early knowledge of students by asking questions in accordance with the topics that will be discussed.

Phase exploration of students given the opportunity discuss and work together with a group of friends for mengontruksi pengetahaun and experience. Critical thinking skills students are trained through observing, testing hypotheses, performing experiments, writing

down the results of the experiment, and is summing up the results of the experiment. On learning, phase control class eksplorasi and eksperimen did a similar activity that is doing the practical work and discussion.

The thing that distinguishes this stage i.e. the class wants presented video of the digestive system. While the control class only got explanations from the teacher. Learning phases of eksplorasi presented the video on classroom experiments provide a positive influence, can be seen from the value of critical thinking skills and critical thinking skills that are higher than the class of the control. Through these activities students get knowledge by way of direct experience, so that his knowledge will be more long remembered. After building the concept of function of digestive organs of students given the problems continued to be performed in the elaboration phase.

Santoso (2017) thought processes from exploration activities spur students to analyze problems, menalarnya and troubleshooting solutions decided the results of exploration activities. It can train students' critical thinking skills on phase eksplorasi.

Phase explanation may involve the ability of students in communicating and concluded the experiment results or discussion (Nida, 2017). In this phase the students do a presentation and discussion of the results of the discussion based on the activities in this phase of exploration.

The next phase of elaboration, the teacher gives a different problem to implement a concept that had been owned, by the way the students are asked to discuss the articles presented. Critical thinking skills in this phase students trained by finding causal relations result with applying the concepts learned in the phases of eksplorasi. It will connect prior knowledge and new knowledge so that it becomes a long-term memory.

The last phase of evaluation, train the student's cognitive ability in assessing thinking skills. This phase, students are requested to present the results of the discussion of the article and conclude the learning outcomes. After it's done posttest to know the ability of late students.

The results of the interview sheet teacher gives positive i.e. students became active in learning, so that students acquire the knowledge of the concept of direct experience. Obstacles faced in implementing the learning Learning Cycle model that is controlling the students at the time of teaching, students who are not familiar in discovering and solving problems.

Students' responses to learning with the Learning cycle model show positive responses. The following is the student's response to the Learning cycle learning model (a) Students like learning activities by applying the Learning cycle model. (b) Students are interested in group learning which allows them to exchange opinions in solving problems. (c) Students still have difficulty following learning Learning cycle must be assisted by the teacher. (d) With the learning cycle Learning cycle students are more motivated and more active in learning.

Weaknesses of learning Learning Cycle in this research include pengaturan time should be disciplined at each phase so that the optimal time, understand each phase of learning, classroom management should be planned. Time management especially in the phases of exploration should be noted especially during teaching and discussion.

CONCLUSION

Based on the results of the research and discussion it can be concluded that the Learning cycle learning model in the digestive system material has a positive influence on learning motivation and critical thinking skills of VIII graders in SMP 3 Jekulo.

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