

## Improvement of Creative Thinking Ability of Students with LKPD Based on Curious Note Program Learning Model

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### Abstract

The ability to think creatively is one of the 21st century abilities that students must have. Curious Note Program (CNP) learning model helps students to maintain the creativity and scientific ability of students. This research aims to determine the improvement of students' creative thinking skills through student worksheets (LKPD) based on Curious Note Program learning model. This research design uses One Group Pre-Posttest. The instrument data collection uses LKPD based on CNP learning model and a description of the ability to think creatively. The research subjects used were students of class X in Temanggung State MA in the academic year 2017/2018. The results showed that through LKPD based on the CNP learning model it could improve students' creative thinking skills with n-gain of 43% in the medium category. Meanwhile, to increase each indicator based on the acquisition of n-gain of 27% fluency in the low category, 37% flexibility in the medium category, originality 22% in the low category and elaboration 56% in the medium category.

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## INTRODUCTION

In the current era of globalization, the demands for quality education are increasingly high, especially in Indonesia. The government's efforts to achieve the quality of education one of them is by perfecting KTSP curriculum into 2013 Curriculum, this is done to answer the challenges of the times so that students can compete in the future.

Permendikbud No. 81A (2013) describes that the ability of students needed in learning include communication skills, critical and creative thinking. The 2013 curriculum also targets students' creativity to be optimally optimized so that they are able to innovate to meet future challenges. The ability to think creatively is a product of creativity. According to Hong (in Rahmawati and Sugianto, 2016), the ability to think creatively is one of the important abilities in the 21st century.

In the Partnership for 21st Century Skills, the ability of the 21st century includes (a) critical thinking and problem solving (b) communication and collaboration, (c) creativity and innovation. Therefore, students must obtain and use it in order to compete with the outside world.

According to Torrance, someone who has the ability to think creatively has the following characteristics: Fluency is the ability to produce a variety of questions or statements. Flexibility is the ability to produce a lot of thought and can see a problem from a different perspective. Originality is the ability to use new and unusual expressions. Elaboration is the ability to develop, elaborate, and expand an idea or idea so that it becomes more interesting (Luthvitasari et al., 2013).

Based on observations in Temanggung MAN that have carried out the Curriculum 2013 there are still some problems in learning among them, learning is still focused on understanding and concepts of physics that are identical with mathematical equations, activities that can help students to improve creative thinking skills have never been done like analyze the difference in motion of objects on different

trajectories, analyze the forces that do business, make graphs, determine the restoration style, etc. Even practicum activities were never planned by the teacher and were never carried out by students. According to Usrotin et al. (2013) said that through practicum activities students will be able to study science, especially physics through direct observation of the symptoms and processes of science, training in scientific thinking skills, developing scientific attitudes. LKPD provided by the teacher is used only for students, which when the discussion method is applied, students only look for answers through the LKPD and do not try to get it from other sources. Seeing from these problems causes many students who still think that physics is a difficult lesson still quite a lot.

Looking at the learning problems in Temanggung MAN and matching it with the 2013 curriculum, learning activities should be carried out using a scientific approach, one of them with scientific inquiry. The learning model that is expected to be appropriate to implement is Curious Note Pogram (CNP) which implements a scientific inquiry approach by combining integrated process skills and the ability to write heuristics (science writing heuristic) that can maintain the creativity and ability of students (Park et al., 2009). In the CNP learning model there are 6 phases or stages namely Introduction, Finding Out Question, Discussion and Determination, Study Related Theory, Inquiry Activity and Conclusion.

The fluency in applying the model is supported by learning tools in the form of student worksheets (LKPD), because LKPD is considered very suitable to implement the stages in the CNP learning model. The reason for this research is to know the improvement of students' creative thinking ability through LKPD based on CNP learning model.

## METHODS

This study uses the pre experiment design method, or also called "Quasi Experiment" in the form of One-Group Pre-Test Post Test Design (Sugiyono, 2014). Subjects in this study

were students of class X MIA 3 MAN Temanggung academic year 2017/2018. Instrument in the study used is LKPD based on CNP learning model and the question of the ability to think creatively given at the pretest and posttest. The data obtained were analyzed descriptively quantitative and qualitative. The effect of using LKPD based on CNP learning model on improving students' creative thinking skills, can be known by using the normalized gain formula according to Hake (in Munif 2016) as follows:

$$\langle g \rangle = \frac{\langle Spost \rangle - \langle Spre \rangle}{100\% - \langle Spre \rangle}$$

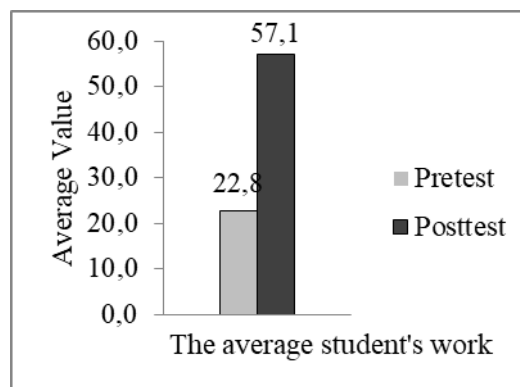
The  $\langle Spost \rangle$  and  $\langle Spre \rangle$  symbols each state the average pretest and post-test scores of each individual expressed in percent (Wiyanto, 2008). With the categories contained in Table 1.

**Table 1.** Gain Score Achievement Category Creative Thinking Ability

Gain score (%)	Category
$0 < g \leq 30$	Low
$30 < g \leq 70$	Medium
$70 < g \leq 100$	High

## RESULTS AND DISCUSSION

The ability to think creatively according to Luthvitasari et al. (2013) includes fluency, flexibility, originality and elaboratio. Assessment of the improvement of students' creative thinking skills is obtained from the acquisition of the results of the pretest-posttest form of the description questions. The provision of pretest aims to determine students' initial creative thinking skills. Pretest was given before giving treatment to students, in this case researchers used LKPD based on CNP learning model. After giving the treatment, students were given a posttest question to find out how to improve their creative thinking skills after using the LKPD. The results of pretest and posttest work on students' creative thinking skills are presented in Figure 1.



**Figure 1.** Comparison of Pretest Achievement and Posttest Results of Students' Creative Thinking Ability

Based on Figure 1 shows that the average results of the Pretest and Posttest scores have increased. The acquisition of the results of the pretest of creative thinking ability of students gained an average score of 22, 8 which showed that none of the students were complete. This is because students have never been given activities by the teacher that can improve students' creative thinking skills besides giving creative thinking questions are also never given and taught by the teacher. As Hashimoto said in Muthaharah et al. (2018) states that a teacher must be able to develop learning material and develop questions so that students' creative thinking skills are more honed and directed.

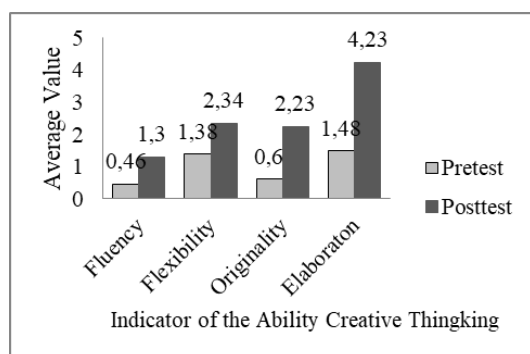
After experiencing learning process using LKPD based on CNP learning model which, in the LKPD there are questions that can foster students' creative thinking skills. the results of posttest creative thinking skills of students get an average score of 57.1. Although it shows that none of the students have been completed but the acquisition of the score has shown an increase. This means that students have started to get used to working on the questions of students' creative thinking abilities found in the LKPD. Meanwhile, the results of the Standard Gain analysis on the work of the Pretest and Posttest questions on the ability to think creatively obtain a percentage score of 43% with the medium category.

The improvement of students' creative thinking skills is classified as medium, because students are not familiar with the use of LKPD

based on the CNP model and the time in learning activities is so short that students become rushed to work on LKPD. Then the questions of creative ability used as pretest-posttest questions were taken from the LKPD itself, in which students must be independently active in finding problems from a learning. As Bruner said in Kurniawan (2016) that the importance of students being actively involved in learning and believes that learning is actually happening through discovery.

Furthermore, Bruner in Kurniawan (2016) said that discovery is a process. The discovery process can be a general ability through training in solving problems. This is the same as the stages in the LKPD, namely the Finding Out Question stage, students are expected to find questions from the observations of the objects they observe and students will be able to obtain answers to their questions.

According to Saparahayuningsih (2010) said that the learning process will be able to increase creativity if students are given the opportunity to think not only in a convergent but also divergent way, namely by increasing indicators of creative thinking abilities. The measurement of increasing the ability to think creatively on each indicator can be seen in Figure 2.



**Figure 2.** Increasing the ability of creative thinking of students in each indicator

Based on Figure 2 shows the increase in the ability to think creatively on each indicator. Fluency can be observed in pretest-posttest questions with the indicators that students are able to provide various answers regarding making various spring circuits according to the

constants determined and formulating questions based on the main idea of spring vibration experiments. Whereas in the LKPD can be observed through the phase of finding out question where students observe objects seriously then write various ways to solve the problems obtained based on observations. On this indicator, the n-gain increased by 27% in the low category.

Flexibility of this indicator can be observed through indicators that students are able to mention a number of pairs of points that show wavelengths based on images and students are able to interpret in detail in observing simple harmonic vibration events. Whereas in the LKPD this indicator can be seen through the finding out question stage in which students make questions based on their observations of the object being observed. This indicator has a n-gain increase of 37% with the criteria being. According to Kiesswetter, as quoted by Pehkonen (in Aziz et al., 2015) states that based on his experience, flexibility thinking is one component of creativity which is one of the most important abilities and must be owned by a problem solver.

Originality is the ability to use new expressions and are not commonly known (Luthvitasari et al., 2013). This indicator can be observed through indicators that students are able to explain in detail examples in the application of simple harmonic motion in everyday life. While in the LKPD this ability can be observed at the Discussion and Determination stage, students are invited to design an experiment based on the topic determined by them. This indicator has a n-gain increase of 22% in the low category. This is in line with Mulyana (2008) stating that this ability is the lowest ability possessed by students and training students to produce unique ideas is not easy. Knowledge that has been owned by students according to Mulyana (2008) is very important to build new knowledge.

In addition, the acquisition of improvements in the low category was also due to the fact that at the Discussion and Determination stage students were very difficult

to pass because students were not used to designing experiments. The same thing is also proven by Park et al. (2009) who said that the Discussion and Determination phase was the most difficult phase because in this stage, students determine the experimental title, variables, tools and materials, work steps and data tabulation independently.

Elaboration, this indicator can be observed through indicators that students are able to explain the effect of amplitude on periods based on observations on spring vibration experiments and use various methods with detailed explanations in determining the speed of a particular position and potential energy of a simple pendulum swing system shown by the picture. While in the LKPD this indicator can be observed at the Study Related Theory stage in which students try to collect data from various reference sources to improve the experimental design of students and find truth based on theory. This indicator has a n-gain increase of 56% in the medium category.

## CONCLUSION

Based on the results of the research and discussion above, the use of LKPD based on the CNP learning model can improve the ability to think creatively by obtaining the results of pretest-posttest students' creative thinking ability according to n-gain of 43% the medium category. Meanwhile, for each indicator, it gained n-gain of 27% in low category, 37% in flexibility in the medium category, originality in 22% in low category and elaboration in 56% in the medium category.

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