The Creative Thinking Skills based on the Learning Autonomy Assisted by Contextual Module and Mentoring

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Article Info	Abstract
	This research aims to describe the effectiveness of independent learning without face-to-face activities assisted by contextual module and mentoring toward the creative thinking skills. This research is a combined research with *sequential explanatory* design. The population of this research consisted of seventh graders of Public JHS 31 Semarang in academic year 2018/2019. The sample consisted of the VII H class learners. They were taken based on three self-confidence categories: high, moderate, and low. Techniques of collecting data were test, interview, and documentation. The findings showed that the autonomous learning assisted by the contextual module and the mentoring was effective. From the six learners with high learning autonomy, they showed a moderate creative thinking skill. From 21 learners with moderate learning autonomy, 11 learners were found to have a moderate creative thinking skill while 10 learners had a low creative thinking skill. From 5 learners with low learning autonomy, 4 learners had a low creative thinking skill while one learner had a moderate creative thinking skill.

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INTRODUCTION

Mathematics is a lesson taught at schools and it is very important in daily lives since humans' activities involve calculation and measurement. Mathematics should be taught for the learners started from the primary school level. It is to prepare them with logical thinking, analytical thinking, systematic thinking, critical thinking, creative thinking, and cooperative skills (Depdiknas, 2006). According to Sunaringtyas et al (2017), in learning mathematics, learners tend to only memorize the concepts taught by the teachers. They are lack of conceptual application skills when they are engaged in a real life problem. They have difficulties to determine and formulate the problem. Thus, they could not solve mathematics problems when they find a little difference even though the problem actually measures the exactly same skill.

Silver (1997) explains that by using opened-problems could provide enormous experiential sources to interpret problems and to develop different solution it is connected to different interpretation. In learning mathematics, creative thinking skill should be developed to allow learners solving problems creatively. Thus, learners could also develop their skills to create the newest solution. According Noer (2009), there are four ways to measure an individual's creative thinking skill. They are: *fluency, flexibility, elaboration, and originality.* According to Huda *et al* (2019), learning demands the learners to be creative in solving daily life problems. It would be the asset for the learners to engage with the future challenges. To develop the learning motivation, it could be done by providing a joyful learning and a supportive learning environment to develop the learning motivation.

The autonomous learning is an active learning encourage by the intention or motif for a specific competence. It is used to solve problems or competence that an individual has. The applied competences as the learning objective, achievement attempt, learning time allotment, learning site, learning rhythm, learning period, learning method, learning source, and evaluation are determined the the learners. Hamalik (2004) states that an effective learning is a learning that provides autonomy for the learners. Thus, they could obtain the knowledge and understanding by themselves. Learners must have creativity, initiation, and confidence upon their skills. Darr & Fisher (2005)

state mathematics-autonomous learning involves a development of an individual's mindset awareness that is applied to solve a problem and devise a strategy. Zimmerman (1990), the autonomous learning has three features, they are the autonomous learning strategy, learner responses for the sake of learning effectiveness oriented feedback, and motivation process. Learners applied a regulated learning strategy to achieve the demanded academic result based on the feedbacks of effectiveness and learning skill.

Zimmerman (2002) argued it as an attempt of the learners to be aware of their limitations. Learners are guided by themselves to determine an objective and a related strategy to the given task to find the problem-solving solution. An autonomous learner is not only successful academically but also for his future optimistically. Butler & Wine (1995) state that autonomous learning involves tasks given for the learners to use their sets of strong skills, to determine their purposes, to improve their knowledge, and to take stages in completing the given tasks. According to Sutama, Hartini & Novitasari (2018), the autonomy identifies the existences of elements such as responsibility, confidence, initiation, strong motivation to be better, making-decision, risk-taking, capability to solve the problems, having no habit to rely on other people, having eager to compete, capability to overcome hindrances, skill to complete a problem accurately, persistent, having skills to settle a problem without other people's assistances, freely action, being not influenced by the environment, having capability to manage his personal necessity, being assertive, and having mastery.

The 2013 curriculum activates learners by using various learning sources. Its implementation covers five learning activities. They are observing, inquiring, experimenting or seeking information, reasoning or associating to process the information, and developing the network or communicating the investigation results. The learning characteristics are the cores for the successful-creative and innovative learners. Actually, the Indonesian JHS learners are learning dependent to other people such as their parents, teachers, peers, and environment. They have not been able to learning autonomously. Therefore, this research applied a learning experiment without a face-to-face activity in the classroom. Learning material is the main element of a teaching-learning process. The

applied learning material was the contextual module and it was implemented for the learners outside of the classroom. According to Anwar (in Dewi, 2015), module is a learning medium containing of materials, methods, limitations, and evaluations that are designed systematically and attractively to reach the expected competence or sub competence in accordance to the complexity levels. According to Wulandari (2016), a contextual module should be designed by the teachers because it influences the learners' competences especially the *soft skills* such as responsibility and autonomy. Module is also directly correlated to the learners' characteristics. Therefore, by relating the module to the materials, tasks, and question with the daily lives, and the portable package for the learners would be better.

A contextual module is a book designed personally based on the school or real life conditions. It is expected to allow learners learn independently in connecting their knowledge to improve their creative thinking skills. The learners were asked to learn independently with the given contextual module. The use of the module would facilitate learners to overcome their difficulties of the module's content.

A mentoring activity was promoted to assist the learners in completing the problems stated in the module. The mentoring activity could create a learning condition for the learners to develop their creative thinking skills. They could also be active due to the module. According to Syaodih and Lisnawati (2018), this mentoring could facilitate the learners' understanding and their basic skills about: A) the basic learning concept and the learning difficulties, b) the symptom and the causes of learning difficulties, c) recognition, exploration, and solution upon the learning difficulties, and d) reflection of the learning and the center of the mentoring based on every individual's uniqueness since every individual has his own uniqueness, potentials, and interests.

Therefore, the researchers conducted this research to investigate the creative thinking skill based on the learning autonomy.

METHOD

This research combined the *mixed method* and the *sequential explanatory* design. The population consisted of the seventh graders of 31 Public JHS Semarang in the academic year 2018-2019. The sample consisted of the seventh graders of VII H class as the experimental group taken by *simple random sampling.*

The qualitative research was done by describing the causal factors and the hindrances of autonomous learning, the autonomous learning based on every learner's category, and observing the mentoring and the interview result data. The subjects consisted of 32 learners from VII H class of 31 Public JHS Semarang. They were categorized into three categories: high, moderate, and low categories.

The qualitative data collection technique was test. The applied data in this research were the creative thinking skill test result data. The data were then analyzed to find out the autonomous learning effectiveness assisted by contextual module through mentoring. The quantitative data analysis techniques consisted of effectiveness test. This test covered minimum mastery standard criterion test, classical completeness test, regression test, and Gain test.

The qualitative data was analyzed by using four stages. They were validity, reduction, display, and conclusion of the data. The data validity test on the data credibility was done by triangulating the technique. It was in which the data test was rechecked to the same sources but with the different techniques. They were creative thinking skill test and the learners' interviews.

RESULTS AND DISCUSSION

The findings showed the influential factors of the autonomous learning were: 1) Intention, 2) Spirit, 3) Curiosity, and 4) Module. In another hand, the experienced hindrances by the learners during the autonomous learning were: 1) the loads of the given tasks by the teachers, 2) difficulties to understand, 3) environments, 4) parents, and 5) lack of awareness upon the correct answers.

The analysis results of the autonomous learning effectiveness assisted by the contextual module by promoting the mentoring toward the creative thinking skills showed the individual's accomplishment test with

a $sig = 0,000 = 0,0\% < 5\%$. Thus, it could be concluded that the average scores of the learners taught by the autonomous learning assisted by contextual module and mentoring reached the minimum mastery standard. It was 68. The proportional completeness test obtained a z-count score 2.35, with a significant level (α) 5% . The $z_{(0.5-\alpha)}$ was 1.64.. Since the z_count > z_table, thus the score of z_count is in 2.35>1.64. Thus, z_count > $z_{(0.5(1-\alpha))}$. Therefore, H_0 is denied and H_1 is accepted. Thus, the obtained learners' proportions taught by the autonomous learning assisted by contextual module and mentoring could reach the minimum mastery standard, 68, for more than 75%. Then, the test of the influence between the autonomous learning toward the creative thinking skills for the group taught by the autonomous learning assisted by contextual module obtained a score of $sig = 0,000$. It was also clearly seen that $sig = 0,000$. Thus, H_0 was denied and H_1 was accepted. Thus, it could be concluded there was a correlation between the autonomous learning and the creative thinking skill. The significance of the correlation was $0,405 = 40,5\%$. The value showed that the autonomous learning variable influenced the learners' creative thinking skills with a value of 40,5%..

Then, the N-gain of the learners' creative thinking skills for the group taught by the autonomous learning assisted by contextual module and mentoring showed 0 learner with high category, 18 learners with moderate category, and 14 learners with low category.

After determining the subjects, the descriptions of the analyzed autonomous learning of the learners showed high, moderate, and low categories as shown in this Table.

Table 1. The Category Result Recapitulation The learning autonomy and creative thinking skills

The Learning Autonomy	The Creative Thinking Skill			Total
	High	Moderate	Low	
High	-	6	-	6
Moderate	-	11	10	21
Low	-	1	4	5
Total	-	18	14	32

Qualitatively, to find the description of the learners' learning autonomy patterns toward their creative thinking skills, the questionnaires were provided and filled by the learners. It was found 6 learners with high category, 21 learners with moderate category, and 5 learners with low category. After being tested, the data were then analyzed. Six learners from each subject category were selected: high, moderate, and low. Based on the analysis, from the experimental group, 6 learners were found to have high learning autonomy. This category showed six learners with a moderate creative thinking skill. From 6 learners with moderate creative thinking skills, 4 learners could meet the indicators. It was in line with the indicators of creative thinking skills such as *originality, elaboration, fluency, and flexibility*. Each indicator could be described below: (1) *Originality* realized into task completion accurately and correctly. (2) *Elaboration* realized into capability to complete the task in detail and correctly. (3) *Fluency* realized into correct problem-completion.

(4) *Flexibility* realized into capability to write three solutions correctly. High-autonomous learners could complete the problems concerning with *originality, elaboration, fluency, and flexibility.*

Meanwhile 2 other learners could not meet the creative thinking skill indicators. It was in line with the creative thinking skill indicators such as *originality, elaboration, fluency, and flexibility*. Each indicator could be described below: (1) *Originality* realized into task completion accurately and correctly. (2) *Elaboration* realized into incapability to complete the task in detail and correctly. (3) *Fluency* realized into the incapability to complete problems correctly. (4) *Flexibility* realized into the capability to write three solutions correctly. High-autonomous learners could not complete the problems concerning with *elaboration and fluency* They could only deal with questions about *elaboration and flexibility*. However, dealing with the indicators of *elaboration and fluency,* they still had several mistakes.

Based on the analysis, from the experimental group, 21 learners with the moderate autonomous learning had 11 learners with a moderate creative thinking skill and 10 learners with a low creative thinking skill.

From 11 learners with the moderate creative thinking skills, they had not met the indicators. It was in line with the creative thinking skill indicators such as *originality, elaboration, fluency, and flexibility.* Each indicator could be described below: (1) *Originality* realized into task completion accurately and correctly. (2) *Elaboration* realized into incapability to complete the task in detail and correctly. (3) *Fluency* realized into the incapability to complete problems correctly. (4) *Flexibility* realized into capability to write three solutions correctly. The learners only could deal with questions about *originality and flexibility.* However, they had not been able to deal with questions containing indicators of *elaboration and fluency.*

From 10 learners with a low creative thinking skill, they had not been able to meet the indicators. It was in line with the creative thinking skill indicators such as *originality, elaboration, fluency, and flexibility.* Each indicator could be described below: (1) *Originality* realized into task completion accurately and correctly. (2) *Elaboration* realized into capability to complete the task in detail and correctly. (3) *Fluency* realized into the incapability to complete problems correctly. (4) *Flexibility* realized into capability to write three solutions correctly. The learners only could deal with questions about *originality, elaboration, and flexibility.* However, they had not been able to deal with questions containing indicator of *fluency.*

Based on the analysis, from the experimental group, 5 learners with the low autonomous learning had 4 learners with a low creative thinking skill and 1 learners with a low creative thinking skill.

From 4 learners with a low creative thinking skill, they had not been able to meet the indicators. It was in line with the creative thinking skill indicators such as *originality, elaboration, fluency, and flexibility.* Each indicator could be described below: (1) *Originality* realized into task completion accurately and correctly. (2) *Elaboration* realized into capability to complete the task in detail and correctly. (3) *Fluency* realized into the incapability to complete problems correctly. (4) *Flexibility* realized into capability to write three solutions correctly. The learners only could deal with

questions about *originality, elaboration, and flexibility.* However, they had not been able to deal with questions containing indicator of *fluency.*

From 1 learner with the moderate creative thinking skills, he had not met the indicators. It was in line with the creative thinking skill indicators such as *originality, elaboration, fluency, and flexibility.* Each indicator could be described below: (1) *Originality* realized into task completion accurately and correctly. (2) *Elaboration* realized into capability to complete the task in detail and correctly. (3) *Fluency* realized into the incapability to complete problems correctly. (4) *Flexibility* realized into capability to write three solutions correctly. The learner only could deal with questions about originality and flexibility; they had not been able to deal with questions containing indicators of *elaboration and fluency.* However, the learner had not been able to complete the questions concerning with the indicators of *originality and fluency.*

CONCLUSION

It could be concluded that the learners' creative thinking skills and mentoring for the learners with the high learning autonomy had a moderate creative thinking skill level. The moderate learning autonomy had a moderate and low creative thinking skill. There were also several learners with low learning autonomy had a moderate and low creative thinking skill.

The contextual module was useful to develop potentials to improve the learners' creative thinking skills and to train the learners to be autonomous learners.

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