Volume 5, Nomor 1, Juni 2021
Numerical: Jurnal Matematika dan Pendidikan Matematika
http://journal.iaimnumetrolampung.ac.id/index.php/numerical
DOI:https://doi.org/10.25217/numerical.v5i1.1152

Description of Google Classroom-Assisted STEM Learning to Improve Students' Mathematical Creative Thinking Skills

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Article Info

Article History
Received: 10-11-2020
Revised: 12-05-2021
Accepted: 08-06-2021

Keywords:

Google Classroom;
Mathematical Creative;
STEM Approach;
Thinking Skills.

Abstract

The learning strategy implemented in schools focuses on teacher centered learning caused the students' mathematical creative thinking skills are not optimally honed. Efforts to shift learning from teacher centered learning to student centered learning are the STEM approach aided google classroom so that students can develop mathematical creative thinking skills optimally. This study aims to determine the STEM approach aided google classroom to improve students' mathematical creative thinking skills in line and angle material. The research method used is descriptive qualitative. The research was conducted in class VII A SMP Negeri 1 Pucakwangi consisted of 28 students. The research subjects were determined using purposive sampling technique. The data analysis techniques were written tests, questionnaires and interviews. The results showed that the approach of STEM aided google classroom is a learning strategy that is able to transform teacher-centered learning into student-centered learning. Students can follow the learning well, interactive so that it runs effectively. The STEM approach is able to improve students' mathematical creative thinking abilities optimally. Mathematical creative thinking able are grouped high, medium and low based on the process and written test scores. The pre-test result showed 1 student (3.6%) was in high category, 7 students (25%) were medium, and 20 students (71.4%) were low. While the results post-test showed that 7 students (25%) were in high category, 19 students (67.9%) were medium, and 2 students (7.1%) were in the low. This shows that there is a significant increase from the low category to the medium and high categories.

INTRODUCTION

Mathematics learning has an important role to develop 4C (critical thinking, creative thinking, collaboration, communication) competencies in an effort to prepare for the 21st century [1]. One of the efforts to support the success of mathematics learning is with stem approaches [2]. A STEM approach is an approach that includes science, technology, engineering, and mathematics packaged into one goal to improve students' creative thinking skills through the process of problem-solving in daily life. In other words, STEM is a combination of science (knowledge), engineering (skills to design a work of innovation/product), and mathematics (logically and systematically composing) that can be used to answer everyday problems through the use of technological advances (technology). In line with Bahrum's opinion, Wahid and Ibrahim [3] stated that STEM is a pedagogical application based on design and engineering technology that teaches practice and content in mathematics and science education simultaneously.

The purpose of STEM learning is not only to train the knowledge side but to train and develop students' skills simultaneously [4]. In addition, students are expected to be able to use scientific approaches, apply and develop technology and analyze solutions to the problems provided [5]. STEM learning emphasizes aspects of system development, processes, and products that can be useful for everyday life. In order for the implementation of STEM learning to run effectively, it can collaborate with the learning model PjBL (project-based learning) assisted by Google Classroom as a learning medium. The concept of learning is implemented on a project-based basis with a home learning system that is using google classroom.

According to Nurfalah [6], google classroom is an internet-based service issued by Google in the form of e-learning with its base of virtual classes where the implementation takes the form of virtual distance learning or utilizing the internet. Reinforced by Sabran and Sabara's research [7] which states that google classroom is useful to be a solution to limited space and save time, making it easier for teachers to evaluate all student activities, help monitor problem solving, and make the teaching and learning process more efficient and effective, can make it easier for teachers to communicate with students and keep classes organized [8].

Not only for teachers, but google classroom can provide benefits for students, namely the application is easy to use and easily accessible to students. So that the application is effectively used as a means of learning media. In addition, google classroom can also provide problem-solving from obstacles in classifying, sharing, and making each assignment by not using paper to students [9]. The goal of the STEM approach implemented through google classroom is for students to be proficient in utilizing increasingly sophisticated technologies such as remote systems. It is reinforced by research from Wahyuaji [10] that stem approaches can be implemented with remote education systems. This research is similarly conducted by Nurani, Uswatun, and Maula [11] stated that the learning process using google classroom runs effectively applied to students and teachers, where in its implementation there are three components that must be considered, namely information gathering, planning and using the right method that is google classroom application. Therefore, researchers use the google classroom application as a learning medium.

Noting the importance of google classroom-assisted STEM learning certainly has an impact on the development of students' mathematical creative thinking skills. Mathematical creative thinking skills are defined as mental ability, sensitivity to problem-solving, considering new ideas in solving mathematical problems. In other words, the ability to think creatively mathematically is the ability to create new ideas or ideas in the field of mathematics [12]. Furthermore, mathematical creative thinking skills have also defined the ability to find mathematical problem solving by means of not only one solution, which includes the ability to think logically, analytically, systematically, critically, and creatively [13]. So, referring to the description, it is concluded that the ability of students in finding new ideas related to complex problem solving so as to solve more than one problem in the field of mathematics. In addition to being able to solve more than one idea, mathematical creative thinking skills can also be solved with different problem-solving points of view [14].

However, efforts in developing mathematical creative thinking skills have not yet occurred. Such conditions are supported by the observations at SMP N 1 Pucakwangi, that teachers apply mathematical learning strategies to the line materials and corners of grade VII is teacher-centered learning so as to cause the development of students' mathematical creative thinking skills to the maximum. Teacher-centered learning is oriented due to the lack of motivation of students' learning, making it difficult to apply various approaches, methods, and models of cooperative learning. This certainly hinders the development of students' mathematical creative thinking skills. As research from Noviyana [15] to improve students' mathematical creative thinking skills, there needs to be an improvement of conventional learning towards cooperative learning created by teachers. Approximately 86.39 students' mathematical creative thinking skills are higher than the average math creative thinking ability of students using conventional learning which is 53.77.

Therefore, a better learning strategy is needed, namely a google classroom-assisted STEM approach in the hope that students are motivated to learn math, be able to apply their skills and knowledge in daily life, and shift learning to student-centered learning that was originally teacher-centered learning which will later trigger students to develop mathematical creative thinking skills optimally. As the problem develops, the researchers intend to describe a google classroom-assisted STEM approach to improving students' mathematical creative thinking skills. Meanwhile, the purpose of this study is to look at a google classroom-assisted STEM approach to improving students' mathematical creative thinking skills.

RESEARCH METHOD

This research method utilizes qualitative descriptive methods. The implementation of research activities in the even semester of the 2019/2020 school year in grade VII A SMP N 1 Pucakwangi was selected with purposive sampling techniques on line and angle materials. The study subject consisted of 28 students. The fundamental thing to consider in choosing a subject is based on the category of low, medium, and high mathematical creative thinking ability. The research instrument consists of written tests in the form of pre-tests and post-tests, structured interviews, and questionnaires.

Mathematical creative thinking ability test instruments include 3 questions where the indicators are adjusted according to Siswono [16] namely originality, flexibility, and fluency. Fluency is the ability of students to solve a problem with varied answers and true value. Flexibility is the ability of students to solve problems in various ways, and originality is the ability of students to solve problems using new answers or ideas that are not the same as other students' answers [17]. In this study each indicator has the following components:

1. Fluency : students can complete 1 creative thinking ability test with various answers and must be of the correct value.
2. Flexibility : students can complete 1 creative thinking ability test in a variety of ways.
3. Originality : the ability of students to complete 1 creative thinking ability test with answers that are not the same as other students or the ability of students in bringing up new ideas.

Before the instrument of the mathematical creative thinking ability test was given to the research subject, the test question was first conducted by testers with class VIII respondents who had received the material. This instrument is tested based on the difficulty of the problem, and reliability test. Based on the results of this question is worth using with the difficulty level in each questions 0.68 including the moderate category and reliability 0.71 falls into the high category.

In this study, five stages were conducted, namely observation, pre-test, STEM learning assisted by Google Classroom during 3 meetings, post-test, questionnaire filling and interview. Here is a description of the stages of research implementation:

a. Observation

Observation methods are used to obtain data related to events or behaviors during the learning process.

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b. Pre-test

Pre-test procurement aims to look at students' early mathematical thinking skills before STEM learning is applied. Furthermore, these results are analyzed and categorized based on low, medium, and high mathematical creative thinking skills.

c. STEM Learning

The concept of STEM learning is that students are able to design a catapult that can bounce the ball 2 meters from start to finish and the ball can bounce perfectly in 30 attempts. Can know the distance of 2 meters that is from the first step measuring the distance from the start point to the finish, then tested. While it can be known if the ball can soar perfectly because the ball soars. STEM learning is conducted through 3 cycles or the equivalent of 3 meetings, namely designing catapult design, designing catapults, presenting catapult results independently. STEM learning is project-based but is done independently and each has staged such as research, discovery, application, and communication.

d. Post-test

The post-test implementation aims to see students' mathematical creative thinking skills after STEM learning. Then there is the degree of difference or not before and after STEM learning is applied.

e. Questionnaires and Interviews

These questionnaires and interviews are provided to know the response of students to the implementation of STEM learning assisted by Google Classroom. The questionnaire was given to 28 students. However, filling out questionnaires and interviews is given to students offline or face-to-face, as is the case with STEM learning. Structured interviews were conducted with 6 selected subjects, including 2 high categories, 2 medium subjects, and 2 low subjects to obtain detailed information.

RESULTS AND DISCUSSION

1. Description of Google Classroom Assisted STEM Learning

This research was conducted in grade VII A SMP N 1 Pucakwangi Pati District in the 2019/2020 school year even semester. This research was actualized through five stages. Based on the process, STEM approach learning is conducted during 3 meetings with project-based concepts and then the application of learning with a remote system that uses google classroom. The role of google classroom here as a learning medium. Where all learning includes problem submission, problem solving discussion, and task collection is done via google classroom. Presentation of STEM learning problems is implemented by designing a catapult project that can fire and bounce ping pong balls to the target in front of him as far as 2 meters during 30 experiments. In designing catapult there are four components of Science, Technology, Engineering, and Mathematics as follows:

Table 1. STEM components in Catapult

Science	The catapult in its manufacture should consider the spring as a load, the lever as the fulcrum to bounce and fire the ball as far as the target.
Technology	The sophistication of existing technology can create catapults or if found in everyday life is referred to as educational toys.
Engineering	Ability to design catapults.
Mathematics	The ability to design catapults or catapults requires the concept of angles as a consideration so that it can fire ping pong balls towards the target.

Here is a clear exposure of STEM learning assisted by Google Classroom: .

a. Activity 1 "Designing Catapult Design

This study was conducted on April 18, 2020. In this activity the learning objectives of students can design catapult designs based on the size and type of angle. The teacher presents an illustration of the catapult that can be used to shoot at the opponent through a learning video, then the student is given the problem to determine the size of the angle on the catapult. Here is a description of the learning process identifying the constituent elements of catapult presented:

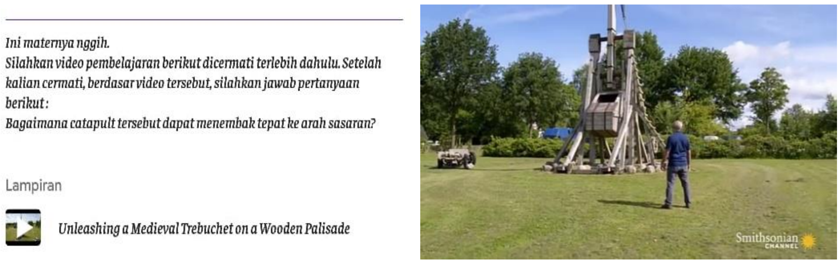

Figure 1. Catapult Project Video Illustration Presentation

Source: Smithsonian "Unleashing a Medival Trebuchet on a Wooden Palisade" Youtube, upload by Smithsonian Channel

Students independently investigate, gather information over the internet, and identify by linking known and learned corner matter to complete challenges. At the stage of collecting information, students can identify problems such as determining and showing the location of springs, firing angles, and levers as the main components in the manufacture of catapults, the following are the results of the identification stages of student problems:

Figure 2. Problem Identification Process

Figure 3. Shooting Angle Location

Source Smithsonian "Unleashing a Medival Trebuchet on a Wooden Palisade" Youtube, upload by Smithsonian Channel

Furthermore, students can design catapult designs through sketches by considering the large angle on the catapult according to the student worksheets that have been given, as well as preparing tools and materials for the manufacture of catapults. Then students present the results

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of the catapult project design via video and sent them to the teacher as a form of project work report. While the teacher conducts an assessment of the learning process and results through observation, video, and student project worksheets. Here are the results of student activities in STEM learning meeting 1:

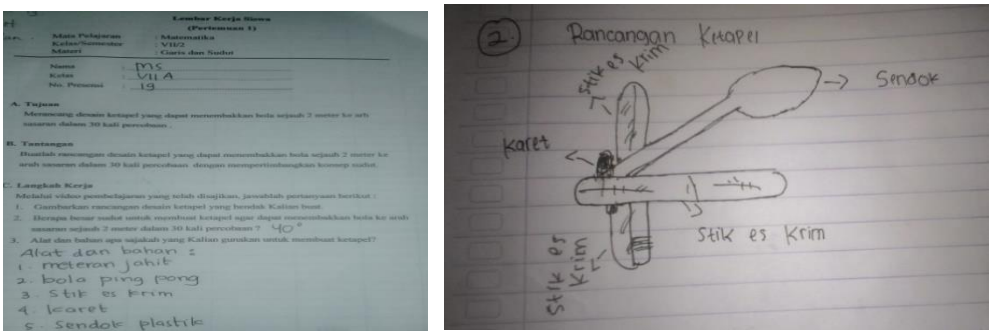

Figure 4. Student Worksheets and Catapult Project Design Results

From the activities of designing catapult design, students are able to show the location of mathematical elements by determining the size of the angle at catapult 35° to 60°. Students classify the location of levers, springs, firing angles as the main components in the manufacture of catapults according to tools and materials. As the example above, students put plastic spoons as levers, rubber as springs, and stacks of ice cream sticks as large determinants of catapult angles.

b. Activity 2 "Designing Catapult Designs"

The second phase of this learning was held on April 22, 2020. The purpose of learning in this second stage, through measuring the angle of students can provide a large size firing angle that will be used to create a catapult design according to the design that has been made at the previous meeting. The teacher presents the form or example of catapult design to students as follows:

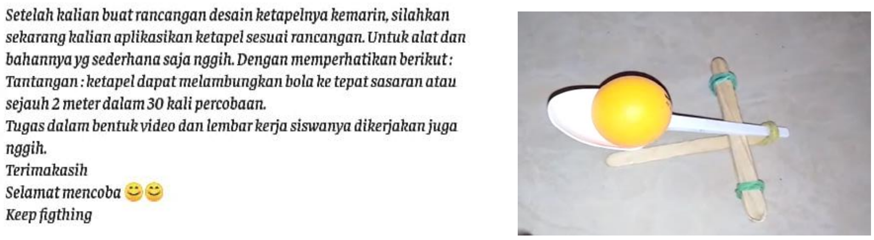

Figure 5. Catapult Project Design Examples

From the presentation of the catapult project design, students are directed to make the design freely, not necessarily the same as exemplified or according to the creation of each student, and can search for references through the internet. However, not forgetting the main component that has been designed at previous meetings to solve the challenge given by the teacher is to be able to bounce the ball perfectly 2 meters away during 30 attempts. Here is the final form of student catapult project design:

Figure 6. Catapult Project Student Design Results

From the second stage of learning in general, all grade VII A students can complete the catapult project well and creatively. Students create catapult designs with simple tools and materials such as ice cream, rubber bands, isolators, used bottle caps, glue, plastic spoons, ping pong balls, and sewing meters to measure distances as well as plastic cups as targets used to fire ping pong balls. Based on this activity, students can conclude that to create a catapult design that can bounce the ball as far as 2 meters during 30 attempts, the angle of fire made does not need to be large. Instead, it has enough angles between 35° to 60°. As the angle of fire gets bigger, the catapult's chances of bouncing the ball perfectly for 2 meters will be smaller. Therefore, the angle formed is quite between the taper angle and the maximum right angle of the angle. This learning can run effectively through Question and Asking in google classroom between students and teachers, then present its products through learning videos sent via google classroom.

c. Activity 3 "Working on Student Worksheets and Presenting"

In the third phase held on April 27, 2020 students are encouraged to work on student worksheets provided by teachers. The purpose of the student worksheet is to measure how far the student can understand the learning that has been implemented to solve the challenges given by the teacher. Students complete the student worksheet according to the learning project of the second meeting that has been shared through google classroom by the teacher. Then the students present the worksheet results. Based on the results of the following research is evidence of student activity in the third learning:

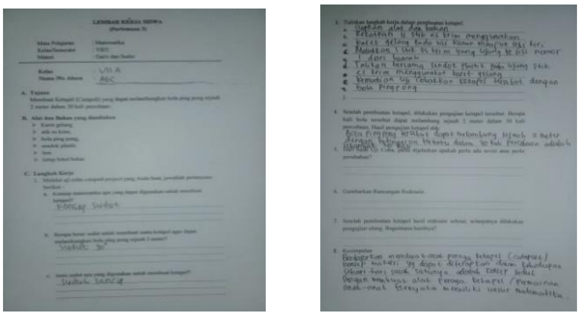

Figure 7. Student Worksheet Results

Based on the three stages of learning, teachers can be with students to simulate that to make the catapult design the necessary angles are 30°, 40°, 45°, 60°, and some mention 90°. Students also argue that the smaller the angle of fire made, the more the catapult can soar perfectly and can fire ping pong balls towards the target well. This is evidenced by the experiment of firing the ball 30 times more often fired right at the target. Various types of angles have been mentioned by students in making catapult designs, as well as taper angles, right angles, and blunt angles. However, what solves the problem is students who use the concept of taper angle. Some students tried to use a blunt angle, but the test results stated that a revision or change to the design was required.

Students using a shooting angle of 30° to 60° can fire the ball on target 23-25 times in 30 attempts. Meanwhile, students who use angles of more than 90° chance of firing the ball to the target are smaller, which is 3-5 tries. However, students also consider the spring to be used in making catapult designs. From the large range of angles mentioned in the design, students can identify the size of the angle using the protractor well.

From this learning, grade VII A students mentioned that the mathematical element turns out to be many benefits in everyday life. For example, what can be found from this learning is the material of lines and angles, especially in the concept of angles used as the basis of making a catapult, or we are familiar with children's games, in addition to the concept of angles can be found in objects around. As for the teacher confirming the opinion of the student that the smaller the angle of the firing made, the greater the chance that catapult can fire the ball towards the target and there are many more benefits of learning the line and angle material that can be found in everyday life.

Based on STEM learning that has been reviewed through three stages, namely the results of catapult design and presenting the design, designing catapult and presenting the results of the design, and working on student worksheets until it can conclude the learning, students can follow it very enthusiastically. This means that the application of STEM approaches runs effectively and can help train students' mathematical creative thinking skills that have not been optimally implemented. It can be proven by the activities that students can express ideas both in the form of knowledge and opinions and the results of catapult designs that have been made. The evidence includes aspects of students' creative attitudes based on the observation of student activities in the course of learning.

Characterized by the presence of students showing curiosity by asking more questions during the learning, having a high imagination is shown at the time of making catapults students already have the imagination that the design of the catapult design to be made will soar perfectly in the direction of the target, students feel challenged to encourage to solve problems that are difficult to show when students are given the challenge to make a catapult so that can bounce the ball 2 meters for 30 attempts, and students dare to risk failure shown when the catapult design is not by the challenges given and must repeat the design and design.

This research is strengthened by research from Sukmawijaya, Suhendar, and Juhanda [18] that STEM-PjBL learning effectively improves students' creative thinking skills such as Brainstorming, Creative problem solving, and project-based learning. Therefore, stem approach learning is appropriately applied to the junior high school level of grade VII in line and angle materials.

2. Description of Students' Mathematical Creative Thinking Ability Pre-Test and Post-Test

At this stage, the researchers carried out a series of pre-tests for a total of 28 students. The test was conducted on April 11, 2020. This pre-test is conducted online using google classroom. The instrument of the pre-test question given there are 3 questions description. Problem number 1 measures the indicator of fluency, question number 2 measures the indicator of flexibility or flexibility, and question number 3 measures indicators of fluency, novelty, and flexibility. This categorization of students' creative thinking skills is analyzed based on the results of the student's

Print ISSN: 2580-3573, Online ISSN: 2580-2437

written test answer description which is based on indicators of mathematical creative thinking ability then classified according to low, medium, and high. Based on the indicators of students' mathematical creative thinking ability according to Siswono [16] has a level of mathematical creative thinking skills such as the following:

Table 2. Mathematical Creative Thinking Ability Level

Level of Creative Thinking Ability	**Characteristic**
Level 4 (Very Creative)	Students can show 3 indicators of creative thinking ability. Indicators: fluency, flexibility, and novelty in solving and asking problems.
Level 3 (Creative)	Students can show 2 indicators of creative thinking ability. Indicators: 1. Fluency and novelty in solving or asking problems, or ; 2. Fluency and flexibility in solving and asking for problems.
Level 2 (Quite Creative)	Students can show 1 indicator of creative thinking ability. Indicators: flexibility in solving or asking problems.
Level 1 (Less Creative)	Students can show 1 indicator of creative thinking ability Indicators: fluency in solving and asking problems.
Level 0 (Not Creative)	Students are unable to demonstrate all three aspects of creative thinking indicators.

In this study, to analyze the classifying or grouping of the level of mathematical creative thinking ability of students is based on the test of students' mathematical creative thinking ability. Then from the test, the study subjects were selected based on the value of the process of working on the test according to each indicator and the test score of students' mathematical creative thinking ability.

Table 3. Student Categorization

Category	**Account**
High	M + 1 SD $\leq X$ 62,5 + 12,5 $\leq X$ 70 $\leq X$
Medium	M - 1 SD $\leq X <$ M + 1 SD 62,5 - 12,5 $\leq X <$ 62,5 + 12,5 50 $\leq X <$ 70
Low	$X <$ M - 1 SD $X <$ 62,5 - 12,5 $X < 50$

The results of the pre-test analysis stated that the mathematical creative thinking ability of grade VII A students has not been optimally distributed. The following are the pre-test results of mathematical creative thinking skills of grade VII A students:

Table 4. Results of Pre-Test Analysis of Students' Creative Thinking Ability

Subject Category	**Many Students**	**Percentage**
High	1	3,6%
Medium	7	25%
Low	20	71,4%
Total	28	100%

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From table 4 above, it was obtained that the ability to think creatively in the high category as much as 1 student (3.6%), the moderate category as many as 7 students (25%), and 20 students (71.4%). The calculation of percentage can be from the following:

$$\mathbf{P = \frac{\mathit{x}}{\mathit{y}}\ x\ 100\%}$$

Information:
P = Category Level of mathematical creative thinking ability
X = Many students who fall into the category of the level of mathematical creative thinking ability
Y = Many students

Sourced from the data above, it was concluded that the early mathematical creative thinking ability of grade VII A students are low. The condition can occur because students are not used to facing different questions than before. This description is supported by the results of TIMMS (Trend International Mathematics and Science Study) which explains that the level of creative thinking ability of Indonesian students is low because it is not used to work on problems in the high and advance category that in its completion requires creative thinking skills [19].

After conducting stem approach learning assisted google classroom conducted a series of post-tests at the fourth meeting. The instrument of the post-test question given is the same as the pre-test question. The mathematical creative thinking ability test was presented to 28 grade VII A students on April 28, 2020. The description of the results of the post-test analysis of students' mathematical creative thinking skills is presented below:

Table 5. Results of Post-Test Analysis of Students' Mathematical Creative Skills

Subject Category	Many Students	Percentage
High	7	25%
Medium	19	67,9%
Low	2	7,1%
Total	28	100%

From the table above, there was a significant improvement between before and after stem approach learning. The number of high-category students increased by 7 students (25%), the category is increasing by 19 students (67.9%), and 2 low-category students (7.1%). The calculation of percentage can be from the following:

$$\mathbf{P = \frac{\mathit{x}}{\mathit{y}}\ x\ 100\%}$$

Information:
P : Category Level of mathematical creative thinking ability
X : Many students who fall into the category of the level of mathematical creative thinking ability
Y : Many students

Improved mathematical creative thinking skills of grade VII A students from low to moderate levels. So it can be said that the STEM approach is effective in mathematics learning in junior high school grade VII, especially in improving students' mathematical creative thinking skills. This condition is in line with Ismayani [20] which states that the application of effective STEM approaches to improve students' creative thinking skills and improve their abilities is at a high and moderate level. This is influenced by learning that involves students being actively involved in the process.

This finding is in line with research from Indriani [21] that the application of STEM shortness can encourage the creative thinking skills of students with good criteria and students give a positive response of 80.54% to the application of STEM approaches. Here's a description of the level of mathematical creative thinking ability of grade VII A students:

1. There are 7 subjects (25%) including in the mathematical creative thinking abilities of high students. Students who are included in the High Level of Mathematical Creative Thinking Ability are subjects that can meet the 3 indicators aspects of originality, flexibility, and fluency in solving problems and grades above 70. Based on interviews with the subject it was obtained that the subject is meticulous in determining the relationship of angles on two parallel lines, can complete the x-value of the number of angles in the triangle in 2 different ways, and can complete the concept of angles in everyday life even though the subject is less thorough in completing them.
2. A total of 19 students (67.9%) were included in the moderate category. Subjects that fall into the category of Moderate Mathematical Creative Thinking Ability Level are subjects that can meet both indicators of fluency and (flexibility) or fluency and novelty (originality) in solving problems and their value between $50 \leq X < 70$. The results of the interview stated that the subject could determine the relationship of the angles on the two lines in line carefully. The subject can show the completion of the x-value at the number of corners of the triangle in varying ways. However, some subjects have not been able to complete the x-value at the number of corners of the triangle. A total of 12 subjects were able to complete the math creative thinking skills test on the indicators of fluency and flexibility in detail in questions number 1 and number 2 as well as questions number 3a and 3b.

   The other 7 subjects can complete the test of mathematical creative thinking ability on the indicators of fluency and novelty shown in the third question. The third question is 3 indicators in 1 question. The seven subjects have different resolutions, of the seven subjects there are 3 subjects who can show a sketch of a 45° angle based on two connected cities and can determine the actual distance between the two connected cities. The other four subjects can solve question number 1 and question number 3c correctly. Although both meet the indicators of fluency and novelty, the way of settlement varies. Based on the interview results, 19 subjects with this medium category can show their completion in different steps. 12 subjects can explain the steps to solve questions 1 and 2 correctly, but question number 3 is not appropriate in solving. While 7 subjects can explain the stages of completion precisely at numbers 3a and 3c. question number 1 and question number 2, the subject is confused in explaining.
3. Low category subjects as many as 2 students (7.1%), in this category the subject can complete one fluency indicator and get a score of <50. The two have different solutions. The subject can meet the indicator of fluency that can solve problem number 1 and the subject one can solve problem number 3a correctly. Based on the results of the interview, the two seemed confused in answering other questions.

3. Description of Student Response Questionnaire

This student response questionnaire is a questionnaire that is used to see the response of students to the implementation of stem learning that is appropriate to train students' creative thinking skills. A total of 28 questionnaires were distributed to each grade VII-A. This questionnaire was distributed after the post-test on April 27, 2020. Researchers have submitted

Print ISSN: 2580-3573, Online ISSN: 2580-2437

13 statement items to 28 students. In this study, the questionnaire data were analyzed per statement item. Based on the per item statement calculated the number of respondents or students who answered this can be shown in the frequency column. The following are the results of data recapitulation obtained:

Table 6. Student Response Questionnaire Results

Information	Statement	Frequency
STEM Learning	Encourages to ask questions/curiosities.	19
	Encourage discovering new ideas.	20
	Collaborate on mathematical concepts with other concepts.	18
	Applying mathematical concepts in problem-solving.	19
	Solve problems in many ways.	16
	Linking materials in everyday life.	25
	The learning atmosphere is not rigid.	28
STEM learning in training creative thinking skills based on indicators of creative thinking	Free to use the favored way.	20
	Free to issue an opinion.	22
	Discuss with friends so you can get a lot of ways to get it resolved.	15
	The way of thinking is different from others.	17

From the table above, it was found that among the 28 students, the majority responded positively to STEM learning which triggered students' curiosity, motivation, and creative attitudes. In addition, stem learning is considered not rigid. This is also reviewed from the way teachers develop mathematical creative thinking skills by developing problems beyond answers and asking students to find other ways. Thus the respondents of the study gave a positive response to the learning of STEM approaches and benefited students. From here students can explore math knowledge with STEM-assisted daily life. Aside from the questionnaire, positive responses can also be obtained from interviews and observations of student activities during the teaching and learning process. This is also supported by research from Octaviyani, Kusumah, and Hasanah [22] which states that STEM learning gets a good response from students about 67.3% interested in learning.

CONCLUSIONS AND SUGGESTIONS

Google classroom-assisted STEM approach learning can run effectively. Evidenced by the spirit and motivation of students in completing the tasks and challenges given by the teacher. Students become more interactive, Question and Asking between students and teachers goes well, and independently explore information during learning. This indicates that google classroom-assisted STEM learning can turn teacher-centered learning into student-centered learning.

Google Classroom's google-assisted STEM approach can optimally improve mathematical creative thinking skills. This is evidenced by the early mathematical creative thinking skills of low students after the implementation of STEM learning assisted by Google Classroom improved at a high and moderate level. The condition proves that Google Classroom-assisted STEM learning provides a significant improvement to students' mathematical creative thinking skills. So it can be said that the Google Classroom-assisted STEM approach is effectively applied to the junior high school level of grade VII.

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Positive responses were obtained from questionnaires and interviews with students that google classroom-assisted STEM approach learning can provide a non-authoritarian learning atmosphere, can trigger curiosity, motivation, and creative attitudes of students, students can explore mathematical knowledge in everyday life so that students are eager to follow the learning of STEM approaches assisted google classroom.

Based on the research that has been conducted, researchers suggest to math teachers pay attention to the learning strategies applied in schools so that students' mathematical creative thinking skills can be trained early. Furthermore, to math teachers and researchers to apply STEM approach learning at the junior high school level with the help of google classroom. In addition to applying fun, innovative, creative, and active learning, it can utilize technology and information to support success in learning.

To teachers and researchers who want to study STEM approaches in order to train students' mathematical creative thinking skills so that they can easily achieve the level of mathematical creative thinking skills at optimal levels. The weaknesses of this study include taking a relatively long time. While the advantages of this research are that it can provide a learning by doing experience, connecting knowledge with links in daily life, and exploring the potential of students' creative thinking.

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Print ISSN: 2580-3573, Online ISSN: 2580-2437