

## Increased activity and critical thinking ability of learners through cooperative learning model type numbered heads together aided by media quipper school in class X Multimedia SMK

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### Abstract

Classroom Action Research through the NHT-aided model of Quipper School media aims to enhance learning activities and critical thinking skills of learners. The subjects of this study are students often grade student. This study was conducted in 2 cycles. there is an increase in student activity during the learning process that is 38% I cycle, and on the II cycle 71%. Based on the cycles test carried out the critical thinking ability of learners also increased from 40% in the first cycle to 80% in cycle II. The result of the research shows the increase of learning activity and critical thinking ability of the students from cycle I to cycle II. From the research result, it can be concluded that the cooperative model of Numbered Heads Together type media quipper school is effective in increasing the activity and critical thinking ability of the students of ten grade student Lesson Year 2016/2017.

**Keywords:** Mathematical critical thinking ability, Learning Activity, NHT, and Quiper School Media.



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### Introduction

The purpose of learning mathematics according to Kemendikbud at the school level among others; learners have the ability to think critically, logically, creatively, problem-solving ability and ability to communicate ideas and math culture; understanding the concepts of mathematics, explaining the interconnectedness of concepts and applying concepts, flexibly, accurately, efficiently and appropriately in problem solving; develop an attitude of appreciating the usefulness of mathematics in life, which has a curiosity, attention and interest in learning mathematics, as well as resilient attitude and confidence in solving problems in everyday life or the real world.

Utilization of technology can change the paradigm of teachers in the process of learning in the classroom is no longer as a teacher but wider as a facilitator, motivator, collaborator, mentor, mentors, trainers, directors, and friends learn that learners more active, enthusiastic and responsible in conducting activities learning. Ginnis also pointed out that creating a classroom atmosphere of inspirational, creative, and innovative learning of the students is one of the duties and responsibilities of the teacher. Media utilization also greatly helps the effectiveness of the learning process, enhancing the comprehension of the subject matter. Then the learning media can help present more interesting data, facilitate interpretation of data and reproduce information.

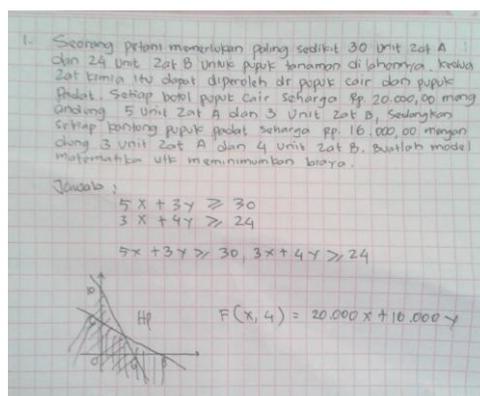
The researcher's experience as a teacher of mathematics at SMKN 1 Six Lingkung, in the learning process the researcher has done improving the quality of learning in the class among them using several learning methods such as discussion, demonstration, group learning. After improving the quality of mathematics learning outcomes has not been optimal as targeted in the minimum completeness criteria established by the school.

Researchers feel that the Lesson Plans (RPP) used have not been optimally designed to develop students' mindsets. Seen in exploration activities students have not been actively involved, such as the absence of activities in the investigation, solve problems and convey ideas. when asked to express an opinion, most learners prefer silence and do not respond. In the learning process there are still many students who have difficulty in learning mathematics. The following percentage of complete mathematical value of students' daily test is presented in Table 1.

Table 1. Percentage Completion of Daily Deuteronomic Value of Students Class X Multimedia for Mathematics Subject Semester 2 Year Lesson 2016/2017.

Daily replay to	amount Learners	Completeness			
		Completed amount	Percentage	Unfinished amount	Percentage
1	23	6	26,09	17	73,91
2	23	4	17,39	19	82,61

The data in Table 1 shows that the learning outcomes of learners in SMKN 1 Six Lingkung not maximal because there are still many students who are not complete. From the answer sheet done by the learner, obtained 75% of the students wrong answer. One example of students' answers can be seen in Figure 1.



Picture 1. Example answer learners

In Figure 1, learners' answers can be seen that most learners still can not understand the command of the problem. This situation is in line with the difficulty of learners in understanding the problem of the nature of the story, learners difficult to find solutions and mensketsakan, and difficult to decipher the matter into the form of mathematics. Students also do not understand how to collect and compile the necessary information, students do not know the things that are known and asked in the situation.

Many factors influence the low activity and critical thinking ability of learners in a learning process, one of them is the absence of learning model and media used by teacher in class. Seeing the above conditions, the author thought how to carry out the learning activities so that learning is not centered on the teacher. The role of teachers will determine the learning outcomes to be achieved.

One of them is by using the model of learning and media is good and proper in teaching that can achieve the purpose of learning effectively and efficiently.

One form of cooperative learning that can increase the sense of personal responsibility of learners to the group is the type of cooperative learning Numbered Head Together. According to Trianto (2012: 82) Numbered Heads Together is a type of cooperative learning designed to influence the pattern of student interaction and as an alternative to traditional classroom structures and learning that involves more students in reviewing the material covered in a learning and checking their understanding of the content of learning the.

One form of cooperative learning that the number of heads of cooperative learning Numbered Head Together. According to Trianto (2012: 82) Numbered Heads Together is a type of cooperative learning designed to influence the structure of student interaction and as an alternative to traditional classroom structures and learning that involves more students in reviewing the material covered in their learning and checking understanding of the content of learning the.

Rizal in Abd. Basith (2015: 3) in explaining, Quipper School which is an educational startup that provides two main services. First, Quipper School Learn which is a special portal of students and secondly, Quipper School Link, which is a special portal for teachers, teachers can prepare tasks, see the progress of learners, send messages to learners, manage classes, and create online classes. so that learners can also learn anywhere by using the internet and improve the mistakes done in doing the exercises.

## Method

The type of research conducted is Classroom Action Research, according to Suharsimi (2010: 3), "Classroom action research is a reflection of learning activities in the form of an act that deliberately appears and occurs in a class together. The classroom action research used in this research is the participant's research, that is, the researcher is involved fully and directly in the research process from start to finish and assisted by observer. Classroom action research was conducted to increase the activity and critical thinking ability of class X students of Multimedia SMKN 1 Six Lingsung which is still considered low.

This classroom action research uses a cycle model developed by Kemmis and MC Taggart, in Vienna Sanjaya (2009: 49). The main concept of PTK consists of four components: Planning, Action, Observation, and Reflection. In the implementation there is a recycling process or cycle that starts from the aspect of developing the planning, performs the action in accordance with the plan, observes the action, and reflects in the form of reflection on the planning, action activities and success obtained. If the action has been able to achieve the expected goal then the conclusion can be drawn directly, but if there is still improvement or learning model used is not successful then proceed to the next cycle. The flow of the research cycle can be seen in figure 2.

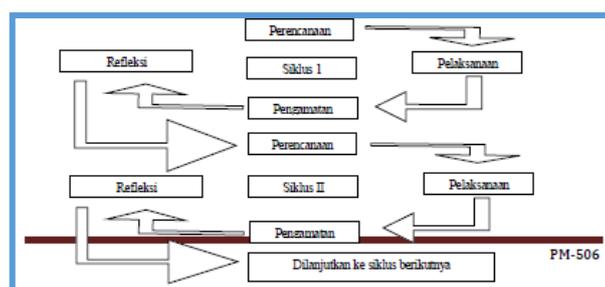


Figure 2. Classroom Action Research Cycle (Kemmis Model and MC Taggart), in Vienna Sanjaya (2009)

Planning phase involves determining the schedule of the research, which is done on the students of class X Multimedia SMKN 1 Six Lingkungan academic year 2016/2017, making the Learning Implementation Plan (RPP) which will be implemented cooperative learning model Numbered Heads Together assisted Quipper School, prepare LKS and LKS answer key, designing group formation. Group formation is heterogeneous based on academic ability, designing instrument observation sheet of student learning activities, validating all the research tools to the validator, designing test questions at the end of the cycle.

Action (action) done at the stage of action is the use of cooperative learning model Numbered Heads Together and Quipper School media in learning mathematics in class X with the effort to increase students' activity and critical thinking ability. The steps are:

1. Introduction includes 1). Login / login to Q-Link (Master Portal) and create classes. 2). Explain to the students the class code in which they work. 3). Sign up for Q-Learn (Student Portal) using the class code. 4). Addendum: Change the look of the language, change the cover image of the class, and change the class settings.
2. Learning process using NHT type cooperative model in the middle of media quipper school.

The Observation stage aims to document the influence of related actions with the process. At this stage researchers are assisted by peers as observers who observe and record student activities by using the observation sheet. The observation sheet contains indicators that reflect student activity in mathematics learning using cooperative learning model Numbered Heads Together Type. Activity indicators observed by observers in this study are: (a). Read the material given by the teacher on Quipper School media, (b). Conducting group discussions; (c) Presentation of the results of the discussion, (d) Ask group members during discussions on the materials and exercises available on the LKS and Quipper School media; (e). Answering or responding to questions; (f) record teacher explanations; (g) Students do the tasks in the Quipper School media.

Reflection is the last step of the classroom action research cycle. After the implementation of the action is completed, then the reflection is done. The results of the reflection were analyzed by looking at how the process of implementation of learning by using cooperative learning model Numbered Heads Together type Quipper School's media in improving students' critical thinking and mathematical thinking.

The results of the analysis on reflection can be used as a reference for the next cycle action plan. If after seen activity and ability of student's mathematical communication on cycle II have reached indicator of success, hence this research only until cycle II. If the activity and the ability of students' mathematical communication in cycle II have not reached the indicator of success then the research continued in the next cycle.

Sources of data in research derived from the learning process that includes planning, implementation and assessment of learning and behavior of teachers and students. Research data in the form of observations from learning mathematics in class X Multimedia SMK examined that is (1) Implementation of learning related to learning activities that include the interaction of teaching and learning between teachers with students, students and students in learning mathematics. (2) Assessment (evaluation) learning in the form of assessment of the results of critical thinking ability.

The instruments used in this study consist of test instruments, observation sheets, field notes, and documentation. The test instruments include (1) Quizzes given to students to measure students' understanding. In this study the quiz is planned to be given at the end of each meeting. (2) The critical mathematical critical thinking test is used after every cycle

Observation sheet contains about student learning activities used to know the activities of students during the learning process takes place. The goal is to know whether the actions performed resulted in a positive change in the learning process as expected

The field note is used to record the progress and constraints encountered during the learning process. Documentation which includes photo and video is one of the data collection techniques in the form of visual picture of an activity. Photos and videos taken in the form of pictures of student activities during the learning process. These photographs and videos are supporting research data that are used as physical evidence of student activities during the lesson.

Technique of collecting data in this research is done through (1) Test instrument which is divided into two that is quiz and test of critical thinking. The value of the tests performed will be made as the value of individual development. (2) Activity observation sheet of learners by making observations that take place from the beginning of learning to the end of each learning process. (3) Field notes used to record progress and constraints encountered during the learning process. Field records data are created after each meeting. This data records the student's activities, the constraints found and the progress that students have achieved during the lesson. (4) Documentation Documentation used is photos and video. Photos and videos are one of the techniques of collecting data in the form of visual representation of an activity. Photos and videos taken in the form of pictures of student activities during the learning process. These photographs and videos are supporting research data that are used as physical evidence of student activities during the lesson.

Data analysis techniques include analysis of student activity observation sheets obtained were analyzed by using qualitative and quantitative analysis (sudjana, 2008: 43). analysis of critical thinking skills tests was conducted to see student learning outcomes after using cooperative learning model Numbered Heads Together assisted Quipper School. The result of students' critical thinking ability is calculated based on the individual completeness obtained by the students. The data of students' mathematical critical thinking ability measured in accordance with Minimum Criterion (KKM) stipulated in SMKN 1 Six Lingsung is 75. The analysis of field notes is done qualitatively by reviewing since the data collection until all data collected. This qualitative data analytical step stems from field notes and documentation during the learning process.

## Results and Discussion

### *Cycle I*

Cycle I held 3 (three) meetings and each meeting was given a quiz. At the fourth meeting was given a cycle I test.

#### Planning(Planning)

The results obtained at this planning stage are learning tools in the form of RPP, LKS, Observation Sheets of student and teacher learning activities, student activity validation sheet, teacher activity validation sheet, LKS validation sheet, RPP validation sheet, quiz validation sheet, and test cycle validation sheet.

#### Action(Action)

Action in cycle I was held 3 times meeting. And at the fourth meeting held cycle I exam. After the test, there were 12 complete students and 18 unfinished students. The result of critical mathematical thinking ability test obtained by students in cycle I will then be shown in the observation section.

#### Observation

Observations made during the learning process took place by researchers and assisted observers.

#### Student activity

Student activity is done to some indicator that is: Student activity read material given by teacher to media quipper school, student activity do group discussion, student activity ask group member during discussion, student activity answer / respond question, student activity record explanation from teacher, and Student activity doing tasks in quipper school.

Table 2. Student activity observation result

Meeting to (%)	Activity (%)						Average	category
	A	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	C <sub>1</sub>	C <sub>2</sub>		
I	40%	57%	13%	27%	23%	-	32%	Kurang
II	60%	63%	13%	37%	23%	33%	38%	Kurang
III	80%	60%	23%	33%	30%	37%	44%	Cukup

Quiz results in cycle I. Quiz results each meeting experienced a slight increase of quiz 1 buds 9 students, 2 complete quiz 10 students, and quiz 3 complete 15 students. The result of the student quiz in cycle I shows that in doing the quiz question looks not so good.

Learning Outcomes of Mathematical Student Mathematical Critical Thinking Skills Number of students who completed 12 students (40% of 30 students). The result of the students' critical mathematical critical thinking has not been in accordance with what is expected.

*Cycle II*

Cycle II is done to improve the actions performed in cycle I. Cycle II is held 3 (three) meetings and each meeting is given a quiz. The last meeting was given a cycle II test.

Planning(Planning)

Planning in the second cycle is preparing RPP, preparing the learning media used in the second cycle of LKS and the material on the media quipper school.Mempersiapkan about quiz and test cycles to be given to students.

Implementation Phase Action (Action)

Action in cycle II was held 3 times meeting. And at the eighth meeting held the second cycle test.

Observation

Student activity during cycle II is almost all improved from the fifth meeting until the seventh meeting. The fifth meeting of the percentage of student activity reached 67% with good category. The sixth meeting of the percentage of student activity reached 69% with good category. The seventh meeting of the percentage of student activity reached 78%. Student activity using NHT-aided model of media quipper school has reached indicator of success that is minimum (61% - 80%) with good category.

Quiz results in cycle II. Students who complete the quiz each meeting has increased from quiz 4 to quiz 6. The fourth complete quiz of students is 19 students, the final quiz of students who completed 23 students. While the six completed students have reached 87% or 27 students from 30 students.

Learning Outcomes of Student Mathematical Critical Thinking Skills. The number of students who completed the second cycle test as many as 24 students from 30 students or 80%. Means have reached indicator of success in this research that is with criteria (66% - 80%). Increasing the number of students completing from cycle I to cycle II is the result of the completion of the action from the previous cycle and the result of the students' critical mathematical critical thinking test is in accordance with the expected.

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