

**THE ENHANCEMENT OF MATHEMATICAL DISPOSITION ABILITY FOR
STUDENT OF JUNIOR HIGH SCHOOL USING CHALK TALK METHOD
WITH CONTEXTUAL TEACHING AND LEARNING (CTL) APPROACH**

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ABSTRACT

The purpose of this study is to determine the interaction between learning process and early mathematical ability towards the enhancement of mathematical disposition ability, and for knowing the enhancement of student's mathematical disposition ability who achieved Chalk Talk method with CTL approach compared conventional learning. The type of this research is quasi-experiment with non-equivalent control group design. The independent variable of this study is Chalk Talk with CTL and early mathematical ability. The dependent variable of this study is mathematical disposition ability. The sample of this study is the student from SMP Muhammadiyah 3 Depok grade VIII, then VIII B and C as the sample. The instrument use scale of mathematical disposition ability and activity note. The data analysis using ANOVA 2 tail technic (significance 5%). The results of this study indicate that there is no interaction between learning and early mathematical ability on enhancing mathematical disposition ability of student, and the enhancement of student's mathematical disposition ability that received Chalk Talk with CTL was not better than student who received conventional learning.

Keywords: Mathematical Disposition Ability, Chalk Talk, CTL

INTRODUCTION

Based on Permendikbud number 58 year 2014, the learning mathematics is not just meant for developing the cognitive domain, but also the affective, such as mathematical disposition. National Council of Teacher of Mathematics (NCTM) explained that Mathematical disposition is a tendency to think and act positively to mathematics. It reflected by student's interest and confidence, alternative skill and persistence to explore when solving problems, and the willingness to reflect their own mind when they learn mathematics. Mahmudi (2010) also said that student really need the mathematical disposition ability to survive from problems, have responsibility for learning and develop good work habits in mathematics. Those characteristics are important to student. Later, student will not use all the material that they have been learned, but they surely need a positive disposition to face life problems.

But in fact, Sya'ban (2009) concluded that the mathematical disposition ability of student in Indonesia has not been perfectly achieved. Based on the study of Trend in International Mathematics and Science Study (TIMSS) on 2011 that concern about attitudes to mathematics, result that Indonesian student who like mathematics only 20% or still below the international standard. Besides, on

Hidayah research (2014) explained that the attitude of student who likes mathematics cannot represent overall of mathematical disposition because mathematical dispositions ability is more than just like mathematics. Nevertheless, it supposes to be basic for student to construct the other positive attitudes and build mathematical disposition ability. On the preliminary studies, Hidayah indicated that student tends to dislike and ignore mathematics. Even they try to learn only for the final exam. Kesumawati (2011) also indicates the same that the mean score of mathematical disposition ability of student only reached 58%

The preliminary study which doing research in SMP Muhammadiyah 3 Depok is also giving the same result. The student passively responds mathematic's learning process and the only one who active is the teacher. The student just finish their obligation as a student of the junior high school that has to accept mathematic's learning and don't need to give the attention to the teacher because they don't like mathematics. The researcher found that the reason why mathematical disposition ability in this school still low caused by the learning process is always run one way, the teacher pulls on the procedural process and recitation, the test just uses the routine test that never can give meaningful mathematics experiences.

Based on the problems above, now is the time to repair the mathematic's learning process in this school. The teacher must apply the method learning which can be facilitating the enhancement of mathematical disposition ability to activating, reasoning, and constructing the meaning of study mathematics, so they start to need it. One of the methods that suitable is Chalk Talk which developed by Emily Sliman (2013) combine with CTL approach. Chalk Talk is a learning method that requires students to communicate and discuss with writing that written on workstations in small groups in order for students to build their knowledge and find meaning in their own way. The class should be completely quiet without anyone having a conversation, it is expected that there is no out-of-topic conversation from the lesson. In discussions, students use different colored pens, and teachers will evaluate the results of their discussions on the workstations. While the CTL approach referred to in this study is the approach used in learning mathematics to relate the material to real life. The real life in question is covering the everyday life and includes the fact of abstract things that the child does not feel strange about it. So The problem formulation in this research are:

- (1) Is there an interaction between learning process and early mathematical ability to enhance student's mathematical disposition ability?
- (2) Is the enhancement of the mathematical disposition ability of student who received the Chalk Talk learning method with CTL approach better than student who received conventional learning?

METHODOLOGY RESEARCH

This research is a quasi-experiment research using two groups, they are experiment group and control group. The design used the quasi-experimental design of non-equivalent control group design with the following model.

Experiment group : 01 X 02
Control group : 01 Y 02

This design classified subjects randomly, 01 is pre-test and 02 is post-test. The experiment group obtained treatment X that is Chalk Talk with CTL approach while control group obtained treatment Y that is conventional learning. This research was conducted at SMP Muhammadiyah 3 Depok grade VIII, academic year 2015/2016. this research did in March 2016. The focus of the material is to calculate the length of the tangent of the two-circle alliance. The population in this study is student of SMP Muhammadiyah 3 Depok academic year 2015/2016. The sample selection was done by purposive random sampling technique. The sample in this study is student from Grade VIII of SMP Muhammadiyah 3 Depok namely VIII A, VIII B, VIII C, VIII D. The eligibility of class VIII students as sample of research is due to OECD definition of mathematical literacy, which states that mathematical literacy test is performed on children who are 15 years old or equivalent with junior high school students of grade VIII. Four classes are selected and VIII B and VIII C as research samples, VIII B as a control group and VIII C as an experimental group, based on recommendations from teachers of mathematics.

The independent variable in this research is Chalk with CTL and early mathematical ability that divided student into 3 categories high, medium, and low, based on Penilaian Acuan Norma (PAN) and Penilaian Acuan Patokan (PAP) (Arifin; 2012). The dependent variable in this research is student's mathematical disposition ability. The instruments of data collection are:

(a) Mathematical disposition scale used Likert model. Responses include 4 categories: Strongly Agree, Agree, Disagree, and Strongly Disagree. This scale gives to student before and after treatment namely pre-scale and posts-scale (Arikunto; 2010). The mathematical disposition scale adopted from the dissertation of Mahmudi, that proved valid to be instrument of mathematical disposition for student in Indonesia.

(b) Activity note

The learning instruments used are:

(a) The plan of learning process (RPP)

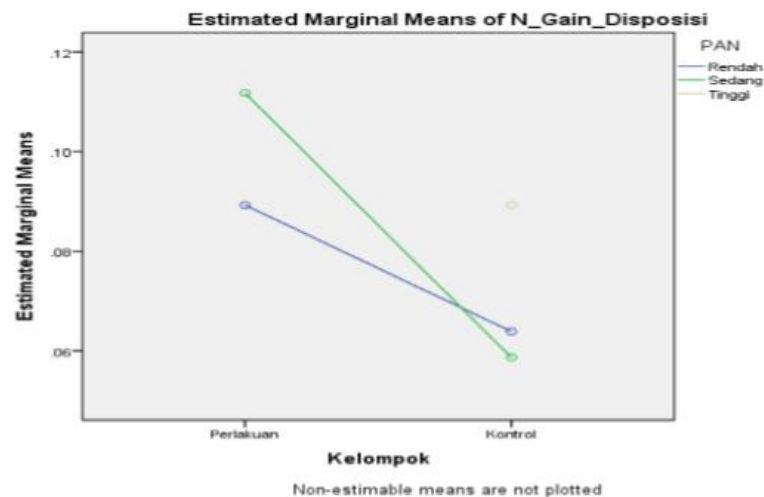
(b) Chalk Talk worksheet

The Technic of data analysis in this study using inferential parametric, it is 2 tail ANOVA test. Furthermore, hypothesis in this research are:

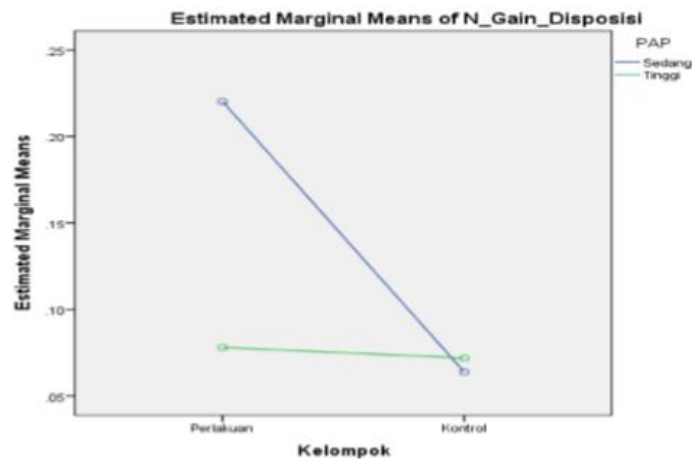
- (a) There is an interaction between learning and early mathematical ability to enhance student's mathematical disposition ability.
- (b) The enhancement of mathematical disposition ability of students who received Chalk Talk learning method with CTL approach better than students who received conventional learning

Result and Discussion

As the result of data analysis, we found that there is no interaction between learning and early mathematical ability PAN and PAP towards the enhancement of mathematical disposition ability and there is no significant influence from Chalk Talk with CTL compared to conventional learning. It means that the different learning method and different student's mathematical early did not make the different enhancement of student's mathematical disposition ability. Then we could say that student who has high, medium, and low categories of early mathematical ability achieved the same enhancement in experiment and control group (Budiyono; 2013). This results based on measurement of descriptive statistical and inferential statistic analysis. This picture below is the interaction result between learning and mathematical early ability towards the enhancement of mathematical disposition ability.



Picture 1. Interaction Between Learning and Early Mathematical Ability (PAP) towards N-Gain of Mathematical Disposition Ability



Picture 2. Interaction Between Learning and Early Mathematical Ability (PAP) towards N-Gain of Mathematical Disposition Ability

The mathematical disposition in this study is based on Mahmudi (2010) defined into several indicators such as self-confidence, persistence, open and flexible thinking, interest and curiosity, monitoring, and evaluate. The process of concept discovery in Chalk Talk with CTL worksheet is considered sufficient for facilitating students, especially on open and flexible thinking. It is seen by student exchange opinions each other. Silberman (2011) said that the exchange opinions can remind student to listen clearly and open their self to any opinions that come. Trianto (2003) said that one thing can influence the perception is the past and to change the past perception need a long time and continue treatment. Overall, all indicators of mathematical disposition ability can be done optimally by Chalk Talk with CTL, but negative past perceptions such as fear, hate, and pessimism to mathematics are still placed on student's mind. So the scale did not make any different significantly in short time.

This result is similar to Wawan (2015), he found that there is no interaction between the Cooperative type Group Investigation learning and early mathematical ability, and Tarida (2014) that also found no interaction between Pembelajaran Matematika Realistik Indonesia (PMRI) and early mathematical ability. Widyasari (2013) is also found the same result, that there is no different on enhancing mathematical disposition ability to student who received Metaphorical Thinking learning and conventional learning. It can be concluded that the cause of no interaction between learning and mathematical early ability and no differences between Chalk Talk with CTL and conventional learning in this study is the frequency of time is too short and the external factors that affected onto student's emotion that can not be totally controlled by researcher, like student's negative past perceptions.

CONCLUTION AND SUGESTION

a. Conclusion

The results of this study is we found that there is no interaction between learning and early mathematical ability towards enhancing student's mathematical disposition ability and the enhancement of mathematical disposition of students who received Chalk Talk learning method with CTL approach is not better than students who received conventional learning.

b. Sugestion

For the next reseacher who wants to study about affective domain, such us mathematical disposition ability, Chalk Talk with CTL method can be used but for more basic competention (*Kompetensi Dasar*). So the frequency of treatment (learning's meet) take for long time.

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