

# INCREASING PRIMARY SCHOOL STUDENTS' ATTITUDE TOWARD MATHEMATICS THROUGH THE IMPLEMENTATION OF TREFFINGER LEARNING USING DAKON GAME

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## Abstract

Mathematics learning at SD 1 Bae Kudus can not make students learn fun yet. Students feel bored in learning and being negative towards math. The purpose of this study is to determine the quality of student attitudes improvement toward mathematics through the application of treffinger learning using dakon game on multiplication materials. This research is an experimental research with one-group pretest-posttest as research design. This research was conducted in grade 2 students of SD 1 Bae Kudus on multiplication material. Data collection technique used in this study is a non-test technique. Non-test technique is used to measure attitudes toward mathematics. Data analysis in this research is the analysis of attitude improvement toward student mathematics. The results shows that students' attitudes toward mathematics increased by 69% through treffinger learning using dakon game which medium category.

**Keywords:**attitude toward mathematics, dakon game, treffinger

## 1 INTRODUCTION

The quality of Indonesian education need to get more attention of all people. Musyaddad (2013) states that the quality of Indonesian education is still under expectation. It can be seen based on low quality of the graduates, low relevance between the education and the need in society, and even politicized education by the stakeholders. However, stakeholder who take important role in the world of education should participate to improve the education quality so that the problem could be solved.

The learning process is one of those components that should be improved in order to create better education. *National Council of Teachers of Mathematics* (NCTM) states that in mathematics learning, students are guided to understand the learnt concept well, so that they would not only able to memorize the concept or mathematics formula (NCTM, 2000). It is aimed to lead the students to

be able to apply the mathematicconcept in their daily life.

In fact, mathematiclearning have not centered in students (*student centered*). This issue affects the lowness of students' mathematic communication skill. It is in line with Siswono's opinion (2012) who states that mathematiclearning is dominated by formula explanation without considering the students' understanding towards what the explained formula is about. However, every student need to possess mathematic communication skill in order to be able to present their mathematical idea and concept in an easy way.

The result from *Trends in International Mathematics and Science Study* (TIMSS) in 2015 reports that Indonesian education scored 397 (Mullie, et al., 2015). It means that the score of Indonesian students is below the international average which is 500. It indicates that mathematic education in

Indonesia have not lead the students to have high-level thinking. Thus, Indonesian students have not found their chance to communicate their mathematical idea and concept which includes as one of abilities in high-level thinking.

The lowness of mathematic communication skills in students influences their attitudes toward mathematic. Students think that mathematic is a difficult and boring lesson so that they happens to be afraid to face it. The teacher should be well aware of the negative attitude since it is the part of students' characteristic that should be considered by the teacher in mathematic learning process. According to Susanti (2013), theoretically, students' achievement is affected by their attitudes toward mathematic. Untari's research (2013) shows that there is an influence between the attitudes toward mathematic and students mathematicachievement. It means that if the students have good attitudes toward math, their achievement will be better than those whose attitude towards mathematic is average or low.

The students' negative attitudes toward mathematics arise as a result of monotonous and less enjoyable learning so that achievement is lesssatisfying. The student's attitudes toward mathematics are their view, anxiety, and belief in Math. The results of Lianghuo, et al. research (2005) concludes that most of students are interested in learning mathematic and intend to improve their abilities, but they do not want to spend more time to learn math. In addition, most of the students are too worry about mathematics and its learning, but on the other hand students do feel that mathematics is important for themselves and their upcoming lives. This can be overcome by changing the learning of mathematics into a fun activity so that positive attitudes toward mathematics can be created.

Based on the interview with second grade teacher of SD 1 Bae Kudus, an

information gained showed that the teacher still taught by explaining the mathematic material or concept, then giving them homework to practice. This kind of learning makes the students are bored yet they prefer to learning by playing. It represents the students' negative attitudes towards mathematic. As the result, students have not been able to achieve maximum learning achievement.

Previous research by Malik (2011) shows that a positive attitude toward mathematics can be enhanced by realistic mathematics learning that links to the mathematical concepts with contextual problems. Learning through the process of discussion and group presentation in a class discussion makes students enthusiastic during the learning. Students are willing to work on the given question, so that the interaction between students as well as students and teachers can be made. Besides, they are willing to explain the strategy in solving the given question in front of their classmates.

Based on the problems, it is necessary to apply an innovative learning in mathematic learning. Treffinger learning, one of cooperative learning model, can be applied to familiarize the students to communicate their mathematical ideas and concept. Besides, the teacher could do some games during the learning process considering that early-grade students still love to learn by playing. *Dakon* becomes one of traditional games that could be an alternative to be integrated to the mathematic learning. Through this traditional game, students can acknowledge the games as a cultural heritage in their life area yet they can be having fun and getting excited in learning process as well. Thus, the students positive attitude towards mathematic can be enhanced.

Based on the previous explanation, a research will be conducted to improve students' positive attitude towards mathematic by applying treffinger learning and *dakon* games in mathematic

learning. The purpose of this research was knowing the improvement quality of students' attitude towards mathematic through treffinger learning-assisted by *dakon* games.

## 2 MATERIALS AND METHODS

This research was conducted to second grade students in second semester of SD 1 Bae Kudus in academic year 2016/2017 with multiplication material. This type of research is an experimental research with pre-experimental design method. The research design used is one-group pretest-posttest design, the details is in Table 1.

**Table 1.** Research Design

Group	Pre-test	Treatment	Post-test
Experiment	$T_1$	X	$T_2$

(Sugiyono, 2010)

Note:

$T_1$  : Pre-test

X : application of *treffinger* learning in Dakon assistance.

$T_2$  : Post-test

The design of this research was used because the subjects of the research were not randomly selected. The research was done according to the conditions in the field. Prior to treatment, students were given a pre-test to measure their attitudes toward mathematics. The next step, students were treated by applying the *treffinger* learning with *dakon* game assistance in the multiplication material. After the treatment was successfully applied, the students were given a post-test to measure their attitudes toward the mathematics.

The technique used in collecting the data was non-test techniques. Non-test technique was used to measure the students' attitudes toward Math. This type of data analysis technique used in this research is data analysis for improving the attitude toward mathematics.

## 3 RESULTS AND DISCUSSION

Data of the attitude towards mathematic was obtained from questionnaires filled by the students. There are 29 questions in the questionnaire which consisted of negative and positive statements. The questionnaires of the attitude towards mathematic was given to the students before and after applying the *treffinger* learning with *dakon* games assistance. Yet, the data analysis of students' attitude towards mathematic included descriptive analysis and gain test.

### 3.1 Descriptive Analysis Of Attitude Towards Mathematic

Descriptive analysis's data of attitude towards mathematic before and after the *treffinger* learning with *dakon* games assistance was being applied is presented in Table 2 as follows.

**Table 2.** Descriptive Analysis's Data of Attitude Towards Mathematic

No	Descriptive Analysis	Before Treatment	After Treatment
1	Number of Student	41	41
2	Maximum Score	116	116
3	Highest Score	49	103
4	Lowest score	17	73
5	Average	32.12	89.90

Table 2 shows that students' attitudes toward mathematics after treatment are better than before treatment of *treffinger* learning-assisted by media of *dakon* games. It can be seen from the average value of students' attitudes toward mathematics before treatment, which is 32.12, while the average after treatment is 89.90. At the time before being treated, the highest score achieved by the students only 49 which means still far from the maximum score, whereas after the treatment is given, the highest score obtained by students almost reaches the maximum score.

### 3.2 Data Normalized Gain Test of The Attitudes Towards Mathematic

The data of students' attitudes towards mathematic was analyzed by using normalized gain test for knowing the improvement of students' attitude towards mathematic before and after the learning. In this research, the improvement is calculated through the gain formula by calculating the difference between the score of post-test and the pre-test then divided by the difference between the maximum score and the pre-test score. The recapitulation of the students' individual attitude improvement toward mathematics by using normalized gain test was presented in Table 3, while the improvement of student's attitudes toward mathematics was classically shown in Table 4.

**Table 3.** Recapitulation of Individual Attitude Improvement Toward Mathematics

Criteria	Number of Students	Percentage
Low	0	0.00%
Average	20	48.78%
High	21	51.22%

Based on Table 3, it is found that the highest improvement occurred on the high criteria of 51.22% or 21 students. The improvements to the average criteria is 48.78% or 20 students, and no students experiencing improvement at low levels.

**Table 4.** Recapitulation of Individual Attitude Improvement Toward Classical Mathematics

Average Pretest	Average Posttest	(g)
32.12	89.90	0.69

Table 4 shows that the improvement of students' attitude toward classical mathematics is equal to 0.69 or 69%. It means that the improvement average of students' attitudes toward mathematics is classically classified in average category.

Based on descriptive analysis of the data of attitude towards mathematics

before and after treffinger treatment-assisted of dakon game, it is obtained that the average of students' attitudes toward mathematic after the treatment was higher than before the treatment of treffinger learning assisted by media game dakon. Students' attitudes toward mathematics were better because students feel more comfortable in learning math-assisted media game dakon. This was in line with Rahayu (2016) which stated that with traditional games integrated into mathematics learning, it would make mathematic as an interesting lesson for students.

Based on the acquisition of students' attitudes toward mathematics before and after treffinger learning with the media of dakon game, it was found that there was an improvement in attitude toward mathematic by 69%. It happened because the paradigm of mathematical learning that begins from teacher-centered was slowly transformed into student-centered and linked in real life. The mathematics learning pattern was student-centered and the use of dakon game media associated with daily life issues, indirectly fosters students' positive attitudes toward mathematics. It was reinforced by the results of Malik's (2011) research, that the positive attitude of students in learning mathematics can be improved through the application of realistic mathematics learning that connects the concept of mathematics with contextual problems.

According to the result of Susanti's research (2013), attitudes toward mathematics would affect student learning achievement of mathematics. The application of treffinger learning-assisted dakon game media in this research invited students to actively learn together with other students in groups while playing using dakon game. In each learning activity, each group was given LKPD to be completed together. The LKPD helped students to learn multiplication materials and familiarize students with mathematical communication skills.

Learning in groups with games would encourage students to interact with others so that a positive attitude in mathematics could be formed. Interaction and positive attitude that built up between students would make students more motivated and interested in learning math. The students' attitudes toward mathematics which was getting improved in this research had an effect on the increasing of students' cognitive aspect that is the students' mathematic communication skills.

#### 4 CONCLUSION

Based on the result and the discussion of this research, it could be concluded that the application of treffinger learning-assisted dakon game on multiplication materials could improve students' attitudes toward mathematics. The improvement of students' attitudes toward mathematics in low category was 0 students (0%), in average category was 20 students (48.78%), and high category was 21 students (51.22%). Classically, the improvement of the students' attitudes toward mathematics was 0.69 or 69% which means that the average improvement of students' attitudes toward mathematics included in average category.

Based on the conclusions obtained, the teacher was suggested to pay more attention to students or groups in learning. Students or groups needed to be well guided so that they would play the game intensely and not just for fun. This was nothing else for the purpose of research to improve the students' attitude towards the mathematics.

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