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Trade A Problem Based Edutainment: The Effect Of Numerical Ability In Indonesia Students'

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ABSTRACT : *This study aimed to determine the effect of Trade a Problem based on Edutainment through students' ability. This research is a quasi-experimental research with a 1×3 factorial design. Data collection through tests in the form of essays. The data analysis technique used a one-way variance analysis with unequal cells and continued with the Scheffe test. The results showed that students using the Trade a Problem based on the edutainment model were as good as the Trade A Problem learning model. Students who used the Trade a Problem based on the edutainment learning model were better than students who used conventional learning models, and students who are using the Trade A Problem learning model better than students who use traditional learning models.*

KEYWORDS: *Edutainment; Numerical Ability; Trade A Problem*

I. INTRODUCTION

Education is an inspiration in improving the nation's morale and preparing people through guidance, teaching, and training activities that are expected to be useful for their role in the future. Learning involves various activities in order to get the desired learning outcomes [1], [2], one of the subjects in schools to achieve this is mathematics. Mathematics can be a challenging subject so that it attracts great interest in learning and curiosity for students, this gives the impression that the quality of existing mathematics education is still far from expectations [3], [4].

Many factors cause students to think mathematics is a challenging and boring subject, one of which is the unsuitable teaching method. In mathematics learning, teachers still use conventional learning models that are still teacher-centered by telling stories or lecturing. Students are less actively involved in the learning process. As a result, the level of understanding of students towards subject matter is low [5]. Seeing this, it is necessary to have systematic, objective efforts to be made so that the learning outcomes of students can be achieved properly [6], [7]. The cooperative learning model involves students as the main element in learning so that students are expected to be more active in understanding a mathematical problem. The learning strategies used in schools will be directly related to the success of the student learning process. The use of learning models that are not following the circumstances of a school will impact the success of students in understanding the concepts being learned [4], [7].

Based on the results of a survey in public schools in Bandar Lampung showed that the numerical abilities of students in mathematics are still below the Minimum Completeness Criteria (KKM) standard, the KKM set by the school for mathematics is 75, with a percentage of 54.45% of students who have not met the KKM. on the numeric ability indicator "number series".

One solution to improve this is to apply a cooperative learning model. One of the cooperative learning models that can be applied is the Edutainment-based Trade a Problem. Various studies on Trade a Problem have had a good effect, including that the Trade a Problem model can improve Students' ability to solve problems [8],

[9], has an effect on mathematical communication skills [5], [10], and can increase the activeness and learning outcomes of students [11], [12].

The results of the research above have a positive impact on the success of learning. This research has novelty as an attempt to differentiate this research from previous research. This effort is to combine the Trade a Problem learning model with Edutainment. Combined with Edutainment in order to measure students' numerical abilities by reasoning numbers, using or manipulating numerical relations and describing them logically [13], [14]. This research is expected to improve numerical skills in mathematics learning.

II. METHODE

This type of research is a Quasi-Experimental Design. This study's design took two samples from the population, including the experimental class and the control class. The research design used in this study was a 1 × 3 factorial design. The research design used in this study was as follows:

Table 1. Research Design

Numerical Ability (A_i) / Teaching Model (B_j)	Teaching Model		
	Trade A Problem (B_1)	*Trade A Problem* based *Edutainment* (B_2)	Conventional (B_3)
A_1	A_1B_1	A_1B_2	A_1B_3

The population in this study were students of class VIII SMPN 28 Bandar Lampung, totaling 234 students. The class sampling technique in this study was carried out using the Simple Random Sampling technique. Data collection through tests in the form of essays. In this study, the data analysis technique used to test the hypothesis was one-way analysis of variance with different cells and continued with the Scheffe test.

III. RESULTS AND DISCUSION

Posttest is done after the learning process. Data from each variable that has been collected will then be used to test the research hypothesis. The data on students' numerical abilities on the flat-sided building material will look for the highest value, the lowest score in the control class and the experimental class. After that we will look for a measure of central tendency which includes the mean, mode, median which can be seen in the following table 2.

Table 2. Data Description of Numeric Ability Scores for Experiment Class and Control Class

Teaching Model	N	Skor Ideal	$Xmaks$	$Xmin$	Central Tendency		
					$\bar{X}$	M_o	M_e
Trade A roblem based *Edutainment*	30	100	100	63.3	84.126	100	90
Trade A Problem	23	100	100	66.6	81.687	80	80
Control	30	100	100	55	72.233	75.8	75.8

Based on Table 4. In the experimental class Trade A Problem Based on Edutainment, the highest value was 100. The lowest score was 63.3. In the Trade A Problem experimental class, the highest score obtained was 100, the lowest score obtained was 66.6. Whereas in the control class, the highest score obtained is 100, the lowest score is 55. The measure of the central tendency of the Edutainment-Based Trade A Problem experimental class is the average class value ($\bar{x}$) is 84.126, the mode (M_o) obtained is 100, and the median (M_e) Obtained is 90. The measure of the central tendency of the experimental class Trade A Problem is the average class value ($\bar{x}$) is 81.687, the mode (M_o) obtained is 80, and the median (M_e) Obtained is 80. In the control class, the measure of the central tendency is the average class value ($\bar{x}$) is 72.233, the mode (M_o) obtained was 75.8, and the median (M_e) obtained was 75.8.

To test the data whether or not the effect of the results of the experimental class's numerical ability (1 and 2) and the control class, it is necessary to test the hypothesis. The summary of the results of the one-way analysis of variance test calculations with different cells is shown in the following table.

Table 3. The Results of the ANOVA

Resources	Sum Square (JK)	Degree Freedom (dk)	Average Degree (RK)	F_{obs}	F_{tabel}	α
Teahcing (A)	2338.226	2	1169.113	7.313	3.111	0.05
Galat (G)	12789.839	80	159.873			
Total (T)	15128.066	82				

Based on Table 3, it can be seen that 7.313 and 3.111 are rejected. It can be concluded that there is an effect of the Edutainment-Based Trade A Problem learning model, the Trade A Problem learning model, and the conventional learning model on numerical abilities.

The method used is the Scheffe method. Testing is carried out for the rejected hypothesis. The following is a recapitulation of the marginal mean:

Table 4. The Result of Marginal Average

Teaching Model	Marginal Average
Trade A Problem based *Edutainment* (μ_1)	84,167
Trade A Problem (μ_2)	81,687
Convensional (μ_3)	72,233
Marginal Average	79,362

Based on the results of the ANOVA calculation, it was found that it was rejected. To find out which learning model is good, it is enough to compare each learning model's marginal magnitude. Suppose the marginal average of the Edutainment-based Trade A Problem learning model is greater than the marginal average for the Trade A Problem learning model and conventional learning. In that case, it means that the Edutainment-Based Trade A Problem is said to be influential. In addition, the results of the one-way ANOVA test with different cells were also rejected, so a further test will be carried out using the Scheffe method to see which has a significantly different effect when the test decision is rejected. The calculation results can be seen in Table 5 below:

Table 5. Comparison Scheffe ANOVA

Comparation	F_{i-j}	F_{tabel}	α	Agreement
$F_{\mu_1-\mu_2}$	0.501	6.222	0.05	H_o Accepted
$F_{\mu_1-\mu_3}$	13.361			H_o Rejected
$F_{\mu_2-\mu_3}$	7.453			H_o Rejected

The ability to use numbers and reasoning (logic) in mathematics, classify and categorize information, think with abstract concepts to find relationships between one thing and another is called numerical ability. Based on data analysis, the study results indicate the influence of the Edutainment-Based Trade A Problem learning model, the Trade A Problem learning model and the conventional learning model on numerical ability.

The Edutainment-Based Trade A Problem learning model aims to make students enjoy more and be more active in thinking individually and in groups. Before the learning time took place, the educators had divided into several small groups and had given small groups and had given groups to each student. At the first

meeting, students looked very noisy when dividing groups. At the stage of making questions and answers, the educator provides a sheet of paper. Before students start working on a discussion, the educator first connects with daily experiences related to the material.

Educators also motivate students so that students are not shy in expressing opinions. Educators call random numbers and ask students to provide some examples in everyday life experiences related to the material. At this stage students look shocked and nervous when expressing their opinions. This resulted in the answer given was not optimal. To anticipate this, the educator calls the same number again in another group to help answer questions, and asks students from other groups to answer these questions and asks to repeat the answers that friends have previously expressed. This was done to increase memory of the material.

Based on this, the numerical abilities of students who are given the Trade A Problem learning model are better than conventional learning models. This Trade A Problem Model has characteristics, namely students have curiosity and tend to group in solving problems [9], [15]. This is consistent with previous research by Desti, et al, with the result that the use of the Trade A Problem model can affect mathematical communication skills.

The Edutainment-Based Trade A Problem learning model aims to make students enjoy more and be more active in thinking individually and in groups [16], [17].

IV. CONCLUSION

This study concludes that students who gave the Edutainment-based Trade A Problem learning model are suitable for numerical ability. Students who use the Edutainment-based Trade A Problem learning model are better than students who use conventional learning models. Students who use the Trade A Problem learning model are better than students who use traditional learning models.

Realize that this research is limited and specific material by taking the material to get up. Therefore, it is suggested there is further study towards the learning of the other material on the Edutainment-based Trade A Problem learning mode.

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