ISSN:xxxx-xxxx

Proceedings of the 1st International Conference on Education, Science Technology And Health (ICONESTH 2023 Universitas Bina Bangsa Getsempena, Sept 25-27, 2023, Banda Aceh, Indonesia

APPLICATION OF TRADITIONAL CATFISH PEG GAMES IN LEARNING MATH ALGEBRA MATERIAL AT SMPN 10 BANDA ACEH

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ABSTRACT

Many factors cause students' ability to learn mathematics to be low. Therefore it is very important to implement an innovative learning that is able to improve students' abilities in learning mathematics, one way that can be taken is to apply the catfish stake game in learning. Patok Lele is a game native to the archipelago which is spread in various regions of Indonesia including in Aceh Province, especially in Banda Aceh, the game Patok Lele is played in groups. The formulation of the problem in this study is whether the application of the traditional Patok Lele game affects the learning of mathematics in algebra material at SMPN 10 Banda Aceh. The aim of this research is to determine the application of the Traditional Patok game to learning mathematics in algebra material at SMPN 10 Banda Aceh. This research belongs to quantitative research, this research is an experimental research type and uses the One Group Pretest-Posttest Design. The results of the hypothesis analysis were carried out using the t pair sample statistical test. Based on the analysis using the t test, the value of t (count) = 21.641 is obtained and t_table = 1.70. So tcount>ttable , it can be concluded that the application of the Traditional Patok Lele game has an effect on learning mathematics in algebra material at SMPN 10 Banda Aceh. In implementing the Traditional Patok Lele game, teachers are expected to be able to look at the difficulties experienced by some students in each step of their learning so that they can immediately help them overcome

Keywords: *Traditional game Patok Lele, Learning Mathematics*

INTRODUCTION

Mathematics is one of the subjects that is important for every student to understand because of its many applications in everyday life. According to Abdurrahman (2012: 204), there are five reasons for the need to learn mathematics, namely: because mathematics is (1) a means of clear and logical thinking, (2) a means of solving everyday life problems, (3) a means of recognizing patterns of relationships and generalizing experiences, (4) a means of developing creativity, and (5) a means of increasing awareness of cultural developments. So, based on this description, it can be concluded that mathematics is very important to master and learn in order to adapt to an increasingly developing era. Papers should be written in English, clearly describe the background of the subject, the author(s)' work, including the methods used, and concluding discussion on the importance of the work.

However, in reality there are still many students who have not been able to master mathematics subjects well, thus causing the low ability of students to understand mathematics lessons and having an impact on the inability of students to achieve the expected learning objectives of mathematics. The low mathematical ability of students can be proven through the results of the National Examination (UN) obtained by Aceh students. According to the Ministry of Education and Culture (2020), the average UN results of Aceh students are still classified as very low for mathematics subjects, the 2020 UN results placed Aceh in 33rd position out of 34 provinces in Indonesia with an average of 38.79. This achievement is still below the national average of 45.52. So, from the UN results a conclusion can be drawn if the ability of Aceh students in mathematics is still low.

Therefore it is very important to apply an innovative learning, learning that is able to design so that students can be actively involved to find their own concepts of mathematical problems through a direct observation made by students. One of the lessons that is thought to be able to overcome the problem of low student ability in mathematics is to apply mathematics learning by using games that students like, so that students will like, be actively involved and not feel bored when taught math material. This is in accordance with what is revealed by Fitriani. (2012: 62) which states that, in learning mathematics, a variety of ways are needed so that students are not bored in learning and according to students' abilities. The game is one way that can be used to channel messages from the sender to the receiver so that it can stimulate the thoughts, feelings, and interests and attention of students in such a way that the teaching and learning process occurs.

One of the games in everyday life that can be applied in learning mathematics is Patok Lele. Patok Lele is an original archipelago game that is spread in various regions of Indonesia including in Aceh Province, especially in Banda Aceh, Patok Lele game is played in groups. In general, the catfish peg game is played in the afternoon, after dawn prayers, full moon nights, and

after prayers in the month of Ramadan. It is played in the field near the house and usually on a fairly wide road in front of the house (Hasanuddin, 2017).

METHODS

Research Approach

Researcher used a quantitative approach with a quasi-experimental type of research. The research design used is One Group Pretest-Posttest Design. The research design can be described as follows:

Table 1. Desain One Group Pretest Posttest Design

Grup	***Pretest***	**Treatmen**	***Posttest***
Eksperimen	O_1	X	O_2

Description:

O_1 : Pretest (learning outcomes before following learning by applying traditional catfish peg games)
X : Giving action by using the traditional catfish peg game model
O_2 : Posttest (learning outcomes after taking part in learning by applying traditional games patok lele
E : Experimental group (Arikunto, 2010: 86).

Population and Sample

Population is the totality of all possible values, the results of calculations or measurements, quantitative or qualitative regarding certain characteristics of all members of a complete and clear collection of studied properties (Sudjana, 2005: 10). The population in this study were all seventh grade students of SMP 10 Banda Aceh in the 2022/2023 school year consisting of 3 classes.

The sample is part or representative of the population studied (Arikunto, 2002: 174). The sample is part of the number and characteristics of the population (Sugiyono, 2009: 81). This study uses cluster random sampling. The modeling carried out in this study is the modeling of classes, this happens because it is impossible to model students and form new classes from these students. In addition, the ability of students in the three classes is the same. The sample selected in this study after guided was VII1 class students who had 24 students.

Research Instruments

Research instruments are tools or facilities used by researchers in collecting data so that their work is easier and the results are better, in the sense that they are more careful and systematic so that they are easier to process. The instruments used in this study are:

1. Learning tools

The learning tools used in this study are in the form of Learning Implementation Plans (RPP), Learner Worksheets (LKPD) and package books. The devices (lesson plans and completeness) used in the experimental class were developed by the researchers themselves and guided by two mathematics education lecturers to ensure the feasibility of their use.

2. Learning outcome test sheet

The instrument for measuring learning outcomes is a test question sheet in the form of a description question consisting of questions on algebraic form material. The learning outcome test questions have been guided by the two lecturers who have been appointed before the field test.

Data Analysis Technique

The most important stage in a study is the data processing stage, because at this stage the research results are formulated after all the data is collected. Data analysis on test results is to provide an assessment score for the completion of test items on the pretest and postest. Data processing activities begin with the following steps:

a. Giving pretest scores of students' math learning outcomes in the experimental class.
b. Determining the posttest score of students' math learning outcomes in the experimental class.
    1) Create a frequency distribution list with the same class length, the steps to be taken are to determine:
        1. Range (R), which is the largest data minus the smallest data
        2. The number of interval classes (K) using the Sturgess rule, namely:
           K=1+ (3,3)log n
        3. Interval class length with the formula:
           $P = \frac{Range}{Many\ classes}$
        4. Select the lower end of the first interval class. For this, it can be taken equal to the smallest data or data values smaller than the smallest data but the difference must be less than the predetermined class length (Sudjana, 2005: 47).
c. Calculate the average with the following formula:

$$\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$$

Description: $\bar{x}$ = Average
x_i = Center value to i
fi = Frequency to I (Sudjana, 2005: 70).

d. Calculating the variance (s) used the formula:

$$s^2 = \frac{n\sum f_i {x_i}^2 - (\sum f_i x_i)^2}{n(n-1)}$$

Description: s^2 = Standard deviation (Sudjana, 2005: 95).

e. Normality Test

The normality test is carried out to determine whether the data is normal or not, tested using the chi-squared test, namely the formula:.

$$\chi^2 = \sum_{i=1}^{k} \frac{(Oi-Ei)^2}{Ei}$$

Description :

χ^2 = Chi-Quadrat distribution
k = Number of classes
O_i = Frequency of observation
E_i = Frequency of expected results (Sudjana, 2005: 273).

The hypotheses presented are:

H0: the sample comes from a normally distributed population
H1: the sample comes from a population that is not normally distributed.

The next step is to compare with the significant level and degree of freedom (dk) = k-1, with the test criteria rejecting if (1 - α) (k -1) and in other cases H0 is accepted.

f. Hypothesis Test

This test was conducted to determine the students' math learning outcomes after and before participating in learning with the application of traditional catfish peg games. The statistical test carried out is paired sample t-test. Paired sample t-test is one of the testing methods used to examine the effectiveness of treatment, characterized by a difference in average before and after treatment (Widiyanto, 2013: 35). paired sample t-test is a test of two paired samples, paired samples are the same subject but experience different treatments.

The hypotheses to be tested in this study are as follows:

H_O : $\mu_2 - \mu_1 = \mu_0$ the application of traditional game Patok Lele has no effect on mathematics learning in algebra material at SMPN 10 Banda Aceh.

H_1 : $\mu_2 - \mu_1 > \mu_0$ the application of the Traditional Game of Patok Lele affects math learning on algebra material at SMPN 10 Banda Aceh.

The paired t-test formula used is:

$$t_{hit} = \frac{\bar{x} - \mu_0}{\frac{SD}{\sqrt{n}}}$$

Description :

t_{hit} : Value $t_{calculate}$
$\bar{x}$: Average difference between initial and final test
μ_0 Difference between the KKM and the average of the initial test
SD : Standard deviation of the difference between the initial and final

tests

n : Number of samples (Susilo dan Emawati, 2018: 110).

This test is carried out at the significance level α = 0.05 and uses the right side t-test. The criteria for drawing conclusions are obtained from the student-t distribution list with $dk = (n - 1)$ and the odds$(1 - \alpha)$. The test criteria are accept and reject $H_0\ jika\ t_{hitung} < t_{tabel}$ dan tolak $H_0\ jika\ t_{hitung} > t_{tabel}$ (Sudjana, 2005: 243).

RESULTS AND DISCUSSION

Researchers collected data using test questions given twice to students who would be involved in the study. The first question given is a pretest given to determine the initial ability of students and the second test given is a posttest which is used to determine the final ability of students after being given learning. The pretest and posttest results obtained by students are as in the table below:

Table 2. Data on Pretest and Posttest Results of Student Mathematics Learning

	N	Min	Max	Mean	Std.D
Pretes	34	24	64	48,41	9,74
Posttes	34	48	88	71,59	10,04

Before paired t statistical testing is carried out, the prerequisite test is the normality test. Normality test is used to determine whether the data is normally distributed or not as one of the prerequisite tests for conducting the Paired Sample t Test analysis test. The following are the results of the normality test of the two data that have been carried out, namely pretests and posttests:

Table 3. Data of Normality Test Results of Pretest and Posttest of Student Mathematics Learning

	N	Chi Square Hitung	Chi Tabel	Kesimpulan
Pretes	34	5,306	7,81	$\chi^2_{hitung} < \chi^2_{tabel}$
Posttes	34	2,9961	7,81	$\chi^2_{hitung} < \chi^2_{tabel}$

Based on the table above, it can be seen that the value of $\chi^2_{hitung} < \chi^2_{tabel}$. So, based on the rules of inference because the value $\chi^2_{hitung} < \chi^2_{tabel}$ H_0 is accepted and H_1 rejected, it can be concluded that the pretest and posttest data of the experimental class samples follow a normal distribution.

After fulfilling the prerequisite test, the next hypothesis test will be carried out using the t test. The hypothesis tested in this study is.

H_O : $\mu_2 - \mu_1 = \mu_0$ the application of the traditional game Patok Lele has no effect on mathematics learning on algebraic material at SMPN 10 Banda Aceh.

H_1 : $\mu_2 - \mu_1 > \mu_0$ the application of the traditional game Patok Lele affects math learning on algebraic material at SMPN 10 Banda Aceh.

The hypothesis testing process is carried out by applying the following formula:

$$t = \frac{M_d}{\sqrt{\frac{\sum x^2 d}{n(n-1)}}}$$

Based on the calculations that have been carried out previously, the following data is obtained:

$M_d = 23{,}44$ $\sum x^2 d = 1316{,}382$ n =34

So the calculation value of t can be seen in the explanation below :

$$t = \frac{23{,}44}{\sqrt{\frac{1316{,}382}{34(34-1)}}}$$

$$t = \frac{23{,}44}{\sqrt{\frac{1316{,}382}{34(33)}}}$$

$$t = \frac{23{,}44}{\sqrt{\frac{1316{,}382}{1122}}}$$

$$t = \frac{5{,}92}{\sqrt{1{,}1732}}$$

$$t = \frac{5{,}92}{1{,}0831}$$

$$t = 21{,}641$$

Based on the steps that have been completed above, it is obtained $t_{hitung} = 21{,}641$ To compare t_{hitung} with t_{tabel}, it is necessary to first find

the degree of freedom using the formula dk = (n - 1) = (34-1) = 33. Based on these calculations, the value = 21.641 is obtained $t_{0,95(33)} = 1{,}70$. Based on the rules of inference because $t_{hitung} \geq t_{tabel}$ then H_0 is rejected and H_1 is accepted. So it can be concluded that the application of the Traditional Patok Lele game has an effect on mathematics learning in algebra material at SMPN 10 Banda Aceh.

CONCLUSION AND SUGGESTION

Conclusion

Based on the results of the analysis and discussion that has been described, it can be concluded that the application of the Traditional Patok Lele game has an effect on mathematics learning on algebraic material at SMPN 10 Banda Aceh.

Suggestion

Teachers are expected to pay more attention in carrying out the teaching and learning process to create a conducive and pleasant atmosphere so as to arouse students' interest and motivation in learning mathematics. It is recommended to other researchers who are interested in the use of Traditional Patok Lele games to conduct research with different materials and classes, but must pay attention to the material that is suitable for Traditional Patok Lele games. In applying the Traditional Catfish Peg game, teachers are expected to be able to observe the difficulties experienced by some students in each step of learning so that they can immediately help them overcome them.

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