THE EFFECT OF TEACHING GAMES FOR UNDESTANDING (TGFU) MODEL WITH MATHEMATICS MONOPOLY MEDIA ON LEARNING MOTIVATION AND MATHEMATICS LEARNING OUTCOMES OF ELEMENTARY SCHOOL CLASS I STUDENTS

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Abstract

The purpose of this study is to describe the motivation and learning outcomes of mathematics using the Teaching Games for Undestanding (TGfU) model with a monopoly on mathematics. The experimental method with the design used in this research is a one-group pretest-posttest research design. In this design it combines pre-test and post-test by conducting tests on subjects before being given treatment and after being given treatment. The results of the hypothesis test show that the value of Sig. (bilateral) is 0.001, meaning that the value of Sig. (bilateral) < less than 0.05, it can be concluded that H0 is rejected and Ha is accepted, namely the learning motivation of the Teaching Games for Understanding (TGfU) model with monopoly mathematics is better than before applying it. the results of the t-test obtained a tcount of 2,773 with a degree of freedom (df) of 32 and a significance value of 5% ttable was 2.01. So it can be concluded that tcount (2.773) > greater than ttable (2.02) which can be interpreted as a Teaching Games for Understanding (TGfU) model with a math monopoly if H0 is rejected and Ha is accepted, which means the model is better than before applying. F count 45.025 thus we can know that the f table is 4.07. Based on the decision above, Fcount (45.025) > greater than Ftable (4.07). So it can be concluded that H0 is rejected and Ha is accepted and Ha is accepted, which means the model is better than before applying. F count 45.025 thus we can know that the f table is 4.07. Based on the decision above, Fcount (45.025) > greater than Ftable (4.07). So it can be concluded that the Teaching Games for Understanding (TGfU) model with monopoly media is better than the Problem Based Learning model assisted by image media.

Keywords: monopoly, tgfu, mathematics, learning outcomes, learning motivation

Abstrak

Tujuan penelitian ini bertujuan untuk menggambarkan motivasi dan hasil belajar matematika menggunakan model *Teaching Games for Understanding (TGfU)* dengan monopoli matematika. Motode eksperimen dengan desain *one-group pretest-posttest research design*. Dalam desain ini menggabungkan *pre-test dan post-test* dengan mengadakan tes kepada siswa sebelum diberi perlakuan dan sesudah diberi perlakuan. Hasil uji hipotesis menunjukkan bahwa nilai Sig. (bilateral) adalah 0,001, artinya nilai Sig. (bilateral) < kurang dari 0,05 maka dapat disimpulkan bahwa H0 ditolak dan Ha diterima yaitu motivasi belajar model *Teaching Games for Understanding* (TGfU) dengan monopoli matematika lebih baik dibandingkan dengan sebelum menerapkan. hasil uji-t mendapatkan t_{hitung} sebesar 2.773 dengan *degree of freedom* (df) 32 dan nilai signifikansi t_{tabel} 5% adalah 2.01. Sehingga dapat disimpulkan bahwa t_{hitung} (2.773) > lebih besar dari pada t_{tabel} (2.02) yang dapat diartikan model *Teaching Games For Undestanding* dengan monopoli matematika jika H0 ditolak dan Ha diterima yang berarti model lebih baik dibandingkan dengan sebelum menerapkan. F hitung 45,025 dengan demikian kita bisa mengetahui bahwa f tabelnya adalah 4.07. Berdasarkan pengambilan keputusan diatas Fhitung (45,025) > lebih besar dari pada Ftabel (4.07). Sehingga dapat disimpukan bahwa H0 di tolak dan Ha diterima, yang berarti model *Teaching Games For Undestanding* (TGfU) dengan media monopoli lebih baik dibandingkan dengan model *Teaching Games For Undestanding* (TGfU) dengan media monopoli lebih baik dibandingkan dengan model *Teaching Games For Undestanding* (TGfU) dengan media monopoli lebih baik dibandingkan dengan model *Teaching Games For Undestanding* (TGfU) dengan media monopoli lebih baik dibandingkan dengan model *Teaching Games For Undestanding* (TGfU) dengan media monopoli lebih baik dibandingkan dengan model *Teaching Games For Undestanding* (TGfU) dengan media monopoli lebih baik dibandingkan dengan model *Teaching berbantuan* media gambar.

Kata kunci: monopoli, tgfu, matematika, hasil belajar, motivasi belajar

INTRODUCTION

In every learning process at school, teachers hope that their students can achieve optimal learning outcomes. However, in the phenomenon that we know, it has been found that many students have not been able to achieve the learning outcomes expected by the teacher. Many students get low scores even though the teacher has helped as much as possible. In other words, these students show learning difficulties. According to Subini (2013) learning difficulties are conditions of student achievement that are not in accordance with established standards in any form. Learning difficulties here can be interpreted as the inability of students to complete tasks or problems shared by the teacher. Students with learning disabilities will have distinctive or different characteristics or characteristics and according to the learning style of each student.

Teachers will be required to be able to monitor the progress or progress of students and apply various strategies in implementing learning in class. One strategy that can be used by educators is by using learning media. Learning media is one of the most important supporting factors for educators. Learning media is used to support the course of learning in class in order to improve the quality of the learning.

Many students feel bored when learning takes place, so this results in a decrease in the interest and quality of student learning. Based on the results of observations at SD Muhammadiyah 22 Surakarta in teaching mathematics, teachers still use learning models that are still less interactive. So this can affect the results of learning mathematics students. From student learning outcomes the average score reaches 60 which is said to have not reached the KKM score of 75. This situation really needs to be considered by the teacher, especially in the use of interesting media and learning models to improve student learning outcomes.

Learning motivation is an important thing in classroom learning, because it will affect students who take part in learning. Students will be excited about learning mathematics in class if students have the motivation to learn. According to Uno (2013: 3) that "Motivation is the encouragement to be able to control behavior better in everyday life." Meanwhile, according to Hamalik (2011: 161) "Motivation determines the success rate of changing student learning behavior". Teachers must be able to motivate students when learning takes place, this will cause students to study diligently. The function of self-learning motivation is to encourage students to be able to achieve good learning outcomes.

Learning media at the time of learning is needed. According to Nurseto (2012: 21) learning media functions as a supporting tool in learning, related to other components, accelerating the learning process, trying to realize quality learning and concretizing the abstract. The development of science and technology is currently growing rapidly, many educators have found a lot of quality learning media. One of them is the Monopoly game media.

Apart from being a supporting tool for conveying messages, the media can also optimize the learning process. According to Solekhah (2015) monopoly media. There is also another study from Evita (2019) which states that monopoly game media can improve students' abilities. There is also another study from Evita (2019) showing a strong effect on cognitive learning activities and outcomes of students.

Based on the facts, researchers offer mathematical monopoly media. Monopoly mathematics is an educational game in the shape of a box and there are question cards. Learning media aims to stimulate the teaching and learning process and increase student learning motivation (Putra Sumberharjo, et al, 2015). The Mathematical Monopoly game media contains question cards which contain a collection of Mathematical questions that have been made. This card is made to answer hands for students to be able to answer questions from Mathematics material and aims to educate students to be able to fulfill the Pancasila Student Profile.

Joyce & Weil (in Rusman, 2012: 133) learning models are designs that can be used to create curricula, design learning materials, and can guide classroom learning. With a continuous less interactive learning model, students will experience boredom, feel easily bored and result in students not understanding the material. Therefore the teacher tries new innovations in teaching how to utilize learning models that can help teaching and learning activities, such as cooperative learning models including types, jigsaw types, Numbered Head Together (NHT), Think Pair Share (TPS), Teams Games Tournament (TGT), type of Teaching Games for Understanding (TGfU) and so on.

The cooperative learning model that can be applied to the Mathematical Monopoly game media uses the Teaching Games For Undestanding (TGfU) model which can be used to

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create an effective learning process that can help natural students master Mathematics material. TGfU is learning that emphasizes understanding in games. Bunker and Thrope (1986) in (Metzler, 2000) explained that the Teaching Games for Understanding (TGfU) has 6 components namely, (1) games, (2) game applications, (3) techniques, (4) decision making, (5) perform skills, and (6) performance. The TGfU approach aims to be understood by students, students must understand how these skills can be used in games, the implementation of techniques in displayed skills.

Based on the explanation given, this study has several objectives. in other words, (a) To describe student learning outcomes in mathematics learning after using the Teaching Games For Undestanding (TGfU) model with monopoly mathematics media is better than before using. (b) To describe students' learning motivation in learning mathematics after using Teaching Games for Understanding (TGfU) with monopoly mathematics media is better than before using. (c) To describe learning outcomes and learning motivation in learning mathematics using the Teaching Games For Undestanding (TGfU) model with monopoly mathematics media is better than before using the Teaching Games For Undestanding (TGfU) model with monopoly mathematics using the Teaching Games For Undestanding (TGfU) model with monopoly mathematics media is better than the Problem Based Learning model assisted by media images.

METHODS

The research method was carried out using a quantitative experimental method. The quantitative method is a method used to collect data in the form of a series of numbers. Creswell (2012) said that the quasi-experimental research subjects were randomly assigned to a group. In this study using a one-group pretest-posttest research design. In this design it combines pre-test and post-test by giving tests to students before being given learning and after being given learning. The pretest was carried out before the research and the post-test was given after the research was completed.

Class	Pretest	Treatment	Post-test
Group Eksperimen	01	Х	02

Prima: Jurnal	Pendidikan	Matematika
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Group Kontrol

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02

Ket :

• Group Eksperimen : Group Eksperimen

01

- Group Kontrol : Group Kontrol
- O1 : Pretest learning outcomes and motivation to learn mathematics in the experimental group and the control group
- X : Treatment (learning mathematics using the Teaching Games for Understanding (TGfU) learning model with monopoly mathematics media).
- O2 : Post-test learning outcomes and motivation to learn mathematics.

This research was conducted at SD 22 Muhammadiyah 22 Surakarta, Banjarsari District, Surakarta City. The population in this study were all first grade students at SD Muhammadiyah 22 Surakarta. The sample in this study were all first grade students at SD Muhammadiyah 22 Surakarta. Class 1A students as the control group and class 1B students as the experimental group. Variables are causal variables from the presence of other variables (Kriyantono (2012: 20). This study has two variables:

1. Independent Variable, namely the Teaching Games for Undestanding (TGfU) with Monopoly Mathematics (X)

The Teaching Games for Undestanding (TGfU) model needs to be implemented in elementary schools because it can improve children's development in the basic concepts of play and focuses on solving tactics through games that students do. The teacher also shows the tactical situation in the playing situation. Meanwhile, students really need to know the correct playing position when in the field, choose the movements to be carried out, and the playing situations that will be faced by students. The Teaching Games For Undestanding (TGfU) model provides easy tactics for students to understand. Monopoly math game is an educational game. Monopoly mathematics is designed to deliver mathematics learning. Mathematical monopoly can be used to attract students' attention so they don't get bored quickly when participating in class lessons, math monopoly can be used during class learning hours or during recess as an educational game.

2. Dependent Variable, namely Learning Outcomes (Y)

Learning outcomes are an act of evaluation of learning activities. As for the opinion of Rusmono (2017) learning outcomes are a form of change in a person's behavior which includes the cognitive, affective, and psychomotor domains. Changes or can be said as improvements in good behavior in the form of actions are obtained after students are able to complete the learning process through interactions with various learning resources and even from their learning environment.

What is meant by learning outcomes in this study is in the cognitive domain, namely in elementary mathematics class 1 arithmetic operations addition and subtraction 1-10. Data collection techniques are a way for researchers to obtain data and information needed in research. There are several ways to obtain data:

1. Test

The results of learning mathematics using the Teaching Games for Undestanding (TGfU) model with monopoly mathematics media in this study will be measured using essay questions. This study used two tests, namely the pretest was carried out before conducting lessons using Teaching Games For Undestanding (TGfU) with monopoly media and post-test after learning the Teaching Games For Undestanding (TGfU) model with monopoly mathematics media.

2. Pretest

The pretest was carried out by the authors in both groups, namely the experimental and control groups. The pretest scores will be analyzed by the authors to understand the difference.

3. Treatment

After the pretest, the authors treated the experimental group using the Teaching Games For Undestanding (TGfU) model with a monopoly on mathematics.

4. Post test

The final step taken by the author is a post-test to the experimental group students.

Table 2.2 Grids of Student Test Problems in Mathematics Learning Outcomes

Jumai Penulu					■ IZI
Lessor	ו IPK	Indikator	Question	Question	Question
Load			Form	Number	Weight
Ma	th 3.5.1 Solve	Presented	Uraian	1,2,4	3
	problems and	picture			
	find the results	questions,			
	of adding and	students can			
	subtracting 1-10	determine			
		the results			
		of addition			
		and			
		subtraction.			
		Presented	Uraian	3,5	2
		word			
		problems,			
		students are			
		able to			
		determine			
		the results			
		of addition			
		and			
		subtraction.			

a. Questionnaire

Questionnaires are questions that are shown to respondents to obtain information. In this study the instrument was carried out to obtain the results of motivation to learn mathematics with the following grid:

No. Aspect	Question Number	Amount
	(+) (-)	

The Effect Of Teaching Games For Undestanding (Tgfu) Model With Mathematics Monopoly Media Sari, Rusnilawati Cognitive which is related to knowledge, 1,4,13,15
 2,5,7,10,21
 views, beliefs about attitude object.

 Affective which is related to what is felt 3,6,11,20
 8,9,12,16,22 9
 like, dislike, pleasure or displeasure, one's emotions and an assessment of attitude).

 Conative which is related to behaving 14,17,19,25 18,23,24 7 and a certain way of doing that is related to the attitude object)

Table 2.3. Learning Motivation Questionnaire

Answers to each question using the scallikert method (four measurement scales), namely with 4 alternative answers, SL (Appropriate), KK (Sometimes), CS (Quite Appropriate) and TS (Not Appropriate). This statement consists of 25 statements. The scores given by respondents to the statement are as follows:

Question			
Alternative Answer	Skor		
SL (selalu)	4		
KK (Kadang-kadang)	3		
CS (Cukup Sesuai)	2		
TS (Tidak Sesuai)	1		

Table 3.3 Score of alternative answers

3.Observation

In Sugiyono's view (2018) revealed that observation is a data collection technique with certain characteristics. In addition, observations are not only limited to humans, but also other natural objects. In observation activities, researchers can learn about behavior and the meaning of this behavior.

4. Dokumentation

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Documentation is data obtained from document sources such as magazines and books. In this study, the authors obtained data from books and journals. All data obtained were then analyzed using several tests such as:

1. Validation Test

Validity can determine how far a measuring instrument can show suitability and determination. Husein Umar (in Sugiyono 2013: 178) validity displays the determination data between data that actually occurs in an object with grouped data.

2. Reliability Test

To collect data on research variables that are reliable or cannot be ascertained through reliability tests. Sugiyono (2013: 110) says that reliability measures how far the results of measurements using the same research object will produce the same data.

3. Normality Test

Santoso (2015: 43) argues that the normality test can be used to determine the distribution of data that will follow or approach the normal distribution, namely the bell-shaped data distribution.

4. Homogeneity Test

The level of homogeneity of the variant of a sample can be known by the homogeneity test. So that the differences that have occurred are not caused by differences in the basic data, a homogeneity test is carried out before comparing two or more groups.

Hypothesis Testing

Hipothesis 1

Ho: Is student motivation in mathematics lessons after using the Teaching Games for Understanding (TGfU) model with monopoly mathematics media no better than before using it. ($\mu_2 \le \mu_1$)

Ha: Is student motivation in mathematics lessons after using the Teaching Games for Understanding (TGfU) model with monopoly mathematics media better than before using. ($\mu_2 > \mu_1$)

Hypothesis 2

Ho: Are student learning outcomes in mathematics learning after using the Teaching Games for Understanding (TGfU) model with monopoly mathematics media no better than before using. ($\mu_2 \leq \mu_1$)

Ha: Are student learning outcomes in mathematics learning after using the Teaching Games for Understanding (TGfU) model with monopoly mathematics media better than before using. . $(\mu_2 > \mu_1)$

Hypothesis 3

Ho: Is learning motivation and learning outcomes in learning mathematics using the Teaching Games for Understanding (TGfU) model with monopoly media no better than the Problem Based Learning model assisted by image media? ($\mu_2 \leq \mu_1$)

Ha: Is motivation and learning outcomes in learning mathematics using the Teaching Games for Understanding (TGfU) model with monopoly media better than the Problem Based Learning model assisted by media images. ($\mu_2 > \mu_1$)

RESULT AND DISCUSSION

A. Deskripsi Data

The results of the research provide an overview and analysis of the material. Data description is an overview of existing data and is used to obtain data from respondents, so that it is more understandable to researchers. Regarding the stages of the Teaching Games for Understanding (TGfU) model (Setiawan & Nopembri, 2020) as follows:

Figure 3.1 The learning process of the TGfU Model (Setiawan & Nopembri, 2020)

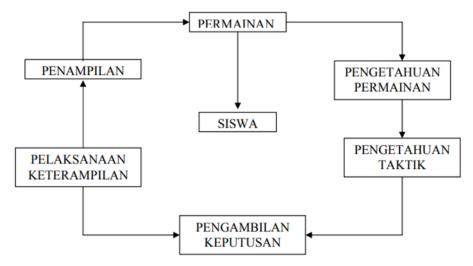


Table 3.1 Pretest Data on Mathematics Learning Outcomes Addition and Subtraction

	Group	Ideal Value	Lowest Value	Highest Value	Mean	
-	Eksperiment	60	30	60	45	
-	Kontrol	60	25	55	40	

After conducting the pretest, the researcher carried out the teaching before finally giving the post-test to students. Calculations revealed that the average pretest score of the experimental group was 80, the highest score was 90 and the lowest was 70. The average pretest score of the control group was 40, the highest score was 60 and the lowest was 30.

Outcomes						
Group	Ideal Value	Lowest Value	Highest Value	Mean		
Eksperimen	60	70	90	80		
Kontrol	60	30	55	40		

 Table 3.2 Post-test Data for Addition and Subtraction Mathematics Learning

The results of the mathematics learning outcomes test for adding and subtracting post-test problems showed that the average score of the experimental group's pretest was 80, the highest score was 90 and the lowest was 70. The average score of the control group's pretest was 40, the highest score was 60 and the lowest was 30. Score the highest in the experimental group increased while the control group was still the same as before, from these data it can be concluded that there is a difference in the average learning outcomes of the addition and subtraction of the experimental group and the control group.

After conducting the post-test, the researcher gave a learning motivation questionnaire to the experimental class. There are 25 questions with 12 positive questions and 13 negative questions. The results of the student learning motivation questionnaire show positive changes, for example in question number 5 the aim is to find out students' motivation for learning mathematics which reads I am lazy to learn math material. With an initial score of 3 it means that many students are lazy to learn math material. At the end of the lesson the researcher gave the same questionnaire as the beginning of the lesson, it was found that the average value of question number 5 had decreased to 2. So it was concluded that the Teaching Games for Understanding (TGfU) model of learning with the monopoly of mathematics had a positive impact on students' learning motivation in mathematics.

A. DATA ANALISIS

At the end of the study, the authors conducted data analysis to test the hypothesis, while the results of this research hypothesis are as follows:

Hipotesis 1

			Pair 1
			PRE TEST - POST
			TEST
Paired Differences	Mean		-35,88235
	Std. Deviation		6,66973
	Std. Error Mean		1,61765
	95% Confidence Interval of	Lower	-39,31161
	the Difference	Upper	-32,45309
t			-22,182
df			16
Significance	One-Sided p		<,001
	Two-Sided p		,000

Tabel 3.3 Uji Paired Sampel Test

Based on table 3.3 it can be seen that the value of Sig. (bilateral) is 0.001, meaning that the value of Sig. (bilateral) < less than 0.05, it can be concluded that H0 is rejected and Ha is accepted, namely the learning motivation of the Teaching Games For Undestanding (TGfU) model with monopoly mathematics is better than before applying it.

Hipotesis 2

Table 3.4 Independent Sampel Test

		Hasil belajar	matematika	
			Equal	
			variances	
			assumed	
Levene's Test for	F		7.986	
Equality of Variances	Sig.		009	
t-test for Equality of	t		2.773	
Means	df		32	
	Significance	One-Sided	<,001	
		р		
		Two-Sided	<,001	
		р		
	Mean Difference		6.708	
	Std. Error Difference		2.665	
	95% Confidence Interval	Lower	1.170	
	of the Difference	Upper	12.534	

Based on the table above, it can be seen if the t-test results get a tcount of 2,773 with a degree of freedom (df) of 32 and a significance value of 5% ttable is 2.01. So it can be concluded that tcount (2.773) > greater than ttable (2.02) which can be interpreted as a Teaching Games For Undestanding (TGfU) model with a math monopoly if H0 is rejected and Ha is accepted, which means the model is better than before applying.

Hipotesis 3

Table 3.5 Anova Test

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11875,000	3	3958,333	45,025	<,001
Within Groups	5626,471	64	87,914		
Total	17501,471	67			

It can be seen in the table above that the F count is 45.025, so we can see that the f table is 4.07. Based on the decision above, Fcount (45.025) > greater than Ftable (4.07). So it can be concluded that H0 is rejected and Ha is accepted, which means that the Teaching

Games for Understanding (TGfU) model with monopoly media is better than the Problem Based Learning model assisted by image media.

CONCLUSION

Looking at the analysis and discussion that already exists, based on the hypothesis formulated, the conclusions in this study can be drawn:

- 1. There is a positive effect on learning motivation in learning mathematics using the Teaching Games for Understanding (TGfU) model with a mathematics monopoly when compared to before implementing it.
- 2. There is an effect of the Teaching Games for Understanding (TGfU) model with monopoly mathematics media compared to before implementing it.
- 3. There is an effect of learning motivation and the Teaching Games for Understanding (TGfU) model with a math monopoly compared to the Problem Based Learning model assisted by media images is better.

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