

# THE EFFECTIVENESS OF GAME BASED LEARNING METHOD WITH PERFECT NUMBER OF MEDIA ON CREATIVE THINKING ABILITY OF ELEMENTARY SCHOOL STUDENTS

**Diserahkan:**  
29 Desember 2021  
**Diterima:**  
30 Desember 2021  
**Dipublikasikan:**  
31 Juli 2022

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**Abstract:** This study aims to determine the effectiveness of Game Based Learning Method with Perfect Number of Media on Creative Thinking Ability of Elementary School Students. The use of perfect number media aims to make learning more interesting and improve students' creative thinking skills. This study used a quantitative approach to the type of experimental research. This research was conducted at SD Negeri Jubelan 01, Kec. Sumowono, Kab. Semarang, Central Java. The population in this study were all students at State Elementary School (SDN) Jubelan 01. The research sample was grade IV students at SDN Jubelan 01. The results showed that the game-based learning method assisted by perfect number media was able to improve students' creative thinking skills. The results of independent sample t-test showed that there was a difference in the average value of the experimental class and the control class and showed a significance level of  $<0.05$ . The results of the simple linear regression test showed that there was an effect as evidenced by a significance value of 0.038. The results of the paired sample t-test showed a significant level of 0.00. Game-based learning methods need to be developed again by combining them with media that can improve students' creative thinking skills.

**Keywords:** Game-Based Learning, Perfect Number, Creative Thinking Ability

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## PRELIMINARY

In facing the globalization era, one of the greatest potentials in preparing human abilities is through mathematics education. This potential can be realized if mathematics can create students who are good at math subjects, as well as foster critical thinking, creativity, initiative, and adaptability to change and development (Tarlina & Afriansyah,

2016). However, in education, there are still problems with the weakness of the learning process.

The ability to think creatively is very important for students to solve the problems they face, especially in mathematics. This ability is very important to be improved so that students can obtain satisfactory achievements in their learning outcomes. In developing these skills, teachers must be able to create democratic learning spaces so that they can spur students to think creatively because every child needs to be given the freedom to make choices according to their skills.

Mathematics is a subject that is still considered difficult by students. So mathematics subjects need to get attention, especially mathematics is a subject that students learn from primary education to college besides that mathematics, is also very influential in other sciences. Mathematics is one of the materials that contain many formulas that must be analyzed properly by each student, but each individual has different limitations in understanding and analyzing the elements contained in these mathematical formulas.

Based on the results of observations made by researchers at State Elementary School (SDN) Jubelan 01, 45% of students' scores are still below the Minimum Criteria of Mastery Learning (KKM). Students have difficulty solving math problems. The teacher provided mathematical concepts and their formulas, along with examples of questions. However, when given a question with a different model, students still find it difficult to do it. Students are still focused on memorizing the given formula or concept, so they are less able to solve problems that are more different from the examples given.

Regarding this condition, there is a need for innovative learning methods that make learning more fun so that students can capture and apply the concepts given by the teacher. One of the learning methods that can be applied is game based learning. According to Vusic, et al (2018), game based learning is learning where teachers can apply games as an activity that can attract students' cognitive interest and motivation to learn. In addition, Stiller & Schworm (2019) also argued that game based learning is applying games in learning to achieve educational goals. Games contain 4 main characteristics in education, including (1) goals/outcomes obtained by students from activities in the game; (2) rules that are restrictions on how players can achieve goals in the game; (3) feedback, which shows how close students are to the goals to be achieved in the game; and (4) voluntary

participation, the voluntary attitude of every student involved in accepting the goals, rules, and feedback that have been applied (Stiller & Achworm, 2019).

These 4 characteristics are the basic reasons for the need for game based learning to be applied in learning to increase learning motivation (Anjani, Fatchan & Amirudin, 2016), interest in learning (Aini, 2018), effectiveness in learning (Liu & Chen, 2013) and learning outcomes. (Noviyanti, 2018). The results of the latest research also stated that the use of games in learning can attract students to understand the concept of the material provided by the teacher (Luhsasi & Permatasari, 2020), and is effective to be developed as an independent learning medium (Sidarta & Yunianta, 2019).

Game based learning methods will be more interesting if integrated into media. According to Arsyad (2007: 75) in the selection of media, several criteria need to be considered, among others, according to the purpose, appropriately supporting the lesson content, practicality, and the skills of the teacher in using media. One of the media that can be used is the perfect number of media. These media spur students to be able to think creatively so that they can increase students knowledge and learning outcomes. Therefore, it is necessary to study the research entitled "The Effectiveness of Game Based Learning Method with Perfect Number Media on Creative Thinking Ability of Elementary School Students". The purpose of this study was to determine the effectiveness of the game based learning method with perfect number media on the creative thinking skills of elementary school students.

## **METHOD**

This research is experimental research. The design of this study used a pre-experimental design of the Intact-Group Comparison type, which is variable research by dividing two groups, namely the experimental group and the control group (Sugiyono, 2017). This design is one of the research designs that is included in the type of pre-experimental research with observations made 2 (two) times, which before the experiment which is called the pre-test and after the experiment is called the post-test. The research location is State Elementary School (SDN) Jubelan 01 Sumowono District. The research population was all students of SDN Jubelan 01. The sample of the study was grade 4 students of SDN Jubelan 01 totaling 15 students. The sampling technique is purposive sampling. According to the research design, this study divided the class into 2

groups, namely the experimental class and the control class. The experimental class consisted of 8 students, the control class consisted of 7 students.

Data collection techniques are tests and observations. The tests used were pretest and posttest at the end of the lesson, to determine students' creative thinking abilities. The observation technique is done by observing the activities of teachers and students in learning by using observation sheets. Data analysis carried out after the study was a paired sample t-test, t-test, linear regression test, and analysis of the value of students' creative thinking abilities.

## RESULTS

### 1. Independent Test Results Sample T-Test

The summary results of t-test are in table 1 below.

**Table 1. Summary of t-test results**

Score	df	Results of Sig. (2-tailed)
pretest	12	0.028
posttest	13	0.016

Based on table 1, it can be seen that the 2-way (t-tailed) significance value is  $< 0.05$  ( $0.028 < 0.05$ ,  $0.016 < 0.05$ ). So it can be concluded that there are differences between the control and experimental groups. The average value of creative thinking ability of the experimental class students was also higher than the control class.

### 2. Simple Linear Regression Test Results

The summary of the results of the linear regression test is contained in table 2 below.

**Table 2. Summary of Simple Linear Regression Test**

Method	Signs.
1 (constant)	0.000
pretest	0.038

Based on table 2, it can be seen that the significance value of creative thinking ability is 0.038 where this value is less than 0.05, then the hypothesis is accepted.

So that there is an effect of using game-based learning methods assisted by perfect number media on students' creative thinking abilities.

### 3. Test Results Paired Sample T-Test

The results of the paired sample t-test are listed in table 3 below.

**Table 3 Test Results Paired Sample t-test**

Pairs		Paired Differences					t	df	Sig. (2-tailed)
		mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pre_control - post_control	-34,000	10,420	3,684	-42,711	-25,289	-9,229	6	.000
Pair 2	pre_experiment - post_experiment	-28,667	11,402	3,801	-37,431	-19903	-7,543	7	.000

Based on table 3, the significance level of the paired sample t-test results shows less than 0.05, i.e.  $0.00 < 0.05$ , then  $H_a$  received. So it can be concluded that the game-based learning method assisted by the perfect number of media is effective in improving students' creative thinking skills.

### 4. Value of Creative Thinking Ability

The summary of data on the value of students' creative thinking abilities is in table 4 below.

**Table 4** Summary of Students' Creative Thinking Ability Score

Class	Average score	Total students	finished	Not finished	Percentage of completeness
Experiment	84,625	8	8	0	100%
Control	78,143	7	6	1	85.71%

Data on the value of students' creative thinking abilities, the average value of the experimental class was 84,625, with the percentage of classical completeness reaching 100%. While in the control class the average score is 78,143, with the percentage of classical completeness only reaching 85.71%. The percentage of creative thinking ability of the experimental class was higher than the control class

(100 > 85.71). This shows that the application of the game based learning method is effective in improving the creative thinking skills of elementary school students.

## DISCUSSION

The results of the 2-way significance value in table 1 show that (t-tailed) < 0.05 (0.028 < 0.05, 0.030 < 0.05, 0.016 < 0.05, 0.021 < 0.05). So it can be concluded that there are differences between the control and experimental groups. The average value of creative thinking ability of the experimental class students was also higher than the control class. The results of this study are supported by research conducted by Luhsasi & Permatasari (2020), that integrating games into learning can attract students' interest in understanding concepts or materials given by the teacher. That way, students' creative thinking skills will also increase. Game-based learning can increase attention, motivation, and curiosity, so that learning objectives can be achieved maximally (Azizah, Mashami, Andayani & Sofia, 2014).

Based on the summary results of the linear regression in table 2, it can be seen that the level of significant value is 0.038 (less than 0.05), so it can be concluded that there is an effect of using game-based learning methods assisted by perfect number media on students' creative thinking abilities. Students' motivation in learning increases because of the perfect number media form which resembles an educational game. Media is a tool for capturing, processing, or rearranging information both visually and verbally (Sukirman, 2015). By using interactive multimedia, students are more enthusiastic and motivated in listening to learning materials (Komalasari & Pamungkas, 2019). Students have an encouragement to keep practicing. Students are very enthusiastic and have high motivation in participating in learning and doing practice questions in the media. Media is a tool that can help the learning process and serves to clarify the material presented by the teacher so that it can achieve better and perfect learning objectives (Kustandi & Sutjipto, 2011). Learning media can help make it easier to understand difficult material, including understanding abstract concepts to become more concrete (Novitasari, 2016).

The summary of results of the paired sample t-test in table 3 also shows a significant level of 0.00 (less than 0.05). So it can be concluded that the game-based learning method assisted by the perfect number of media is effective in improving students' creative thinking skills. Visual media can improve students' creative thinking

skills. students' creative thinking. Nisak (2014) mentioned that one of the goals of visual media is to increase students' concentration. With the concentration of these students, students creative thinking abilities will be automatically explored. Perfect number media with game based learning method helps students in improving their creative thinking skills. Integrating games into learning is very effective as a medium used by students to practice independently (Sidarta & Yuninta, 2019).

## CONCLUSION

The results showed that application of the game-based learning method assisted by perfect number media was effective in improving students' creative thinking skills.

Results showed that the game-based learning method assisted by the perfect number of media was able to improve students' creative thinking skills. Results of the independent sample t-test showed that there was a difference in the average value of the experimental class and the control class and showed a significance level of  $<0.05$ . Results of the simple linear regression test showed that there was an effect as evidenced by a significance value of 0.038. The results of the paired sample t-test showed a significant level of 0.00. Data on the value of creative thinking skills also shows that the percentage of completeness in the experimental class is greater than in the control class. The use of these methods and media should always be used because it makes students motivated in learning. The perfect number media needs to be developed again so that it is more detailed in measuring the level of student's creative thinking abilities.

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