



# The Effect of Lego Games on Improving Children's Creativity Development

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Received: 02 11 2022 :: Revised: 28 12 2022 :: Accepted: 31 12 2022

## Abstract

**Purpose** – This study aims to determine the effect of the lego game on lego games in increasing the development of creativity in children aged 4-5 years at TK Aisyiyah ABA Konang Glagah Lamongan. Following the problems found in the field, the lack of learning the media used by teachers results in children feeling bored more quickly in carrying out teaching and learning activities and only emphasizing their academic development so that the development of creativity is not given enough attention.

**Design/methods/approach** – This type of research uses a quantitative approach with a pre-experimental type and a one-group pretest-posttest design in collecting the data, namely making initial observations before being given treatment, treatment, and final observations after being given treatment. Data collection techniques used observation and documentation; data analysis used IBM SPSS with paired samples t-test. In this research, researchers conducted data mining using research instruments on children aged 4-5 years in TK Aisyiyah ABA Konang Glagah Lamongan.

**Findings** – The results of the study show that the influence of the use of lego games increases the development of children's creativity—the output of the paired sample t-test evidence this A significant value is obtained, namely  $0.008 < 0.05$ . It indicates that  $H_0$  is rejected and  $H_a$  is accepted, meaning that there is a significant influence on increasing the development of children's creativity using lego games.

**Research implications/limitations** – This research only focuses on children aged 4-5 years with a limited number of 15 whose area is only in TK Aisyiyah ABA Konang Glagah Lamongan and in this study only uses lego games as a medium to increase the development of creativity in children.

**Practical implications** – The results of this study are expected to help parents understand the creative talents possessed by children so that they can stimulate this development with the right strategies and methods.

**Originality/value** – This research provides an in-depth understanding of one of the early childhood learning media to enhance creativity development using lego game media.

**Keywords:** Lego; Child; Creativity

**Paper type:** Research paper

## Introduction

Early childhood is a child under the age of eight, as stated by NAEYC (Amini Mukti, 2014). The National Association for the Education of Young Children (NAEYC) in Soemiarti Patmonodewo suggests that early childhood is a child from birth to the age of eight years. At the age of 0-8 years, children have a very rapid increase in intelligence. Therefore this period is Golden Age (Golden age). Period Golden Age is a time for children to explore what they want to do, like develop attitudes, potential intelligence, and creativity in children as much as possible (Watini, 2020). In order to be able to develop all the potential in children, they need stimulus from more adults (Green et al., 2021; Kauschke et al., 2019; Rhodes et al., 2020). In this effort, providing education for early childhood is very important for the next life as the nation's successor (Liang et al., 2020; Yuliantini et al., 2021).

Early childhood education is a suitable place to carry out learning activities and play for children (Bers et al., 2014; Broström, 2006). Children can recognize rules, discipline, responsibility, and independence from this education, interact with their environment, develop empathy, and work with friends (Fahyuni & Arifin, 2021; Utomo & Alawiyah, 2022). Playing skills in children vary depending on the development of the child itself. From playing, the child will generate big imagination to add to the child's interest in these toys (Davis et al., 2022; Veraksa et al., 2022). Bruner said that emphasizing play's function is a means to develop creativity and flexibility (Susanto, 2021). As seen from the natural function of play, what is more, important for children is the meaning of the play and not the result (Albanese et al., 2019; Tedjasaputra, 2001).

Sternberg & Lubart also said that "creativity is the process of generating ideas that are novel and bringing into existence products that are appropriate and of high quality" (Barton, 2014). Creativity is a way to trigger ideas and produce them in a natural product. Therefore, creativity must be adapted to the curriculum that applies to early childhood education because the curriculum must indeed cover all developments at each stage to be developed. Children's creativity will develop more optimally if the family environment supports it, so it is not only in the school environment. Because children's creativity can develop if the surrounding environment is also supportive, but it is often found that parents want their children to be talented as well as creative, but they do not know how to stimulate talent in their children, and some do not even want to know what the characteristics of a child are. Creative.

After observing the activities, researchers found problems in creativity in that some children aged 4-5 years at Kindergarten Aisyiyah ABA Konang Glagah Lamongan have been unable to improve their abilities in developing creativity. It is caused by the teacher conducting learning only by providing a blank paper, which is used as a drawing medium for children, so some children are still confused about what to draw. Another example is that the learning media is mainly based on student worksheets because teachers usually place more emphasis on academic development. Some of these things make children prefer copying their friends' activities, are reluctant to create, and prefer to talk to their friends so that their creative talent will not be known to children. Though if you want to know the characteristics of creative children, they can use specific methods to stimulate development, for example, using games, because games are one of the media to increase creativity and reduce children's boredom while learning.

Therefore, this study uses learning media in the form of Lego games so that they can be used as learning media to enhance the development of children's creativity. This game was chosen because it increases children's creativity and is fun. Playing lego requires the imagination and intellect of the players. Lego is also a popular game in the world with various versions. Lego is a constructive game classified as productive (Kartini & Susilawati, 2018). Following the results of the initial observations, the researchers found that when they were at TK Aisyiyah ABA Konang Glagah Lamongan, especially at the age of 4-5 years, they found problems regarding the level of creativity of children who were considered to be still low, this is seen when the child's learning is lacking exploratory.

Research on the problems found during these observations researchers has reviewed several previous studies relevant to their research. Research first, namely: regarding the effect of the application of lego games on the cognitive abilities of group A children in the Surabaya Toddler Palace Kindergarten, shows that the use of the lego game stated there was a significant influence on cognitive abilities with the output of the analysis prior to treatments 16.27 and after treatments 36.17 where the value of  $t_{count} < t_{table}$ , i.e.  $0 < 16$  (Santi, 2013).

The second study, entitled the influence of lego games on the development of creativity in children aged 5-6 years at PAUD Melati, Martapura Village, Attitude Dalam, was a quantitative study and the results of the study stated that the value of pretest the level of undeveloped children is higher than after being given treatment, so the level of undeveloped children is decreasing day by day after being given treatment, it is proven from the output values for three days, namely: the first day of the post-test is 80%, and the pretest results are 45%, the second day it increases to 85% and 60% pretest, and then on the third day the development of creativity is 90% and 65% pretest so giving lego games is the right way to increase creativity in children aged 5-6 (Diswiko, 2020).

Recent research on the application of learning through play in increasing creativity and fine motor skills of early childhood in Alkhairaat 1 Kindergarten, precisely in Palu City, states that the use of learning through unit block games has a significant effect on increasing children's creativity and fine motor skills. At the same time, conventional approaches do not affect increasing creativity. Early childhood in Alkhairaat Kindergarten, so it can be concluded that learning to use unit blocks is a learning model that can increase creativity and fine motor skills in early childhood. As the results of the research study above, there are differences with the research conducted: research locations, learning models, and enhanced development. Thus, this study examines the influence of the application of lego games in increasing the development of creativity.

## Methods

A research approach is a quantitative approach to the type of experimental research. In this experiment, the type of pre-experimental design was used. Pre-experimental designs are designs that have not been truly experimental. With the type of one-group pretest-posttest design, the method of development is by taking one measurement at the beginning (pretest) before the treatment and after that another measurement (post-test). The population specified in this study were all children aged 4-5 years in Aisyiyah ABA Konang Glagah Lamongan Kindergarten, totalling 15 children.

Research has something important, namely data collection techniques. Because data obtained from the field through research instruments must be processed and analyzed so that the results obtained can be used to answer questions in research, the first data collection technique in this research is observation, used to observe children's activities before being given treatment (pretest) and also after being given treatment (post-test). When giving treatments in learning using lego games, after obtaining the results from observations, the assessment of the instrument used is the form of a checklist ( $\checkmark$ ), and the measurement scale used is Rating Scale. The second is documentation in the form of photos of the activities and the results of the children's work at TK Aisyiyah ABA Konang Glagah Lamongan, starting from the results of the pretest, treatment, post-test, which are used as a complement to the research that has been carried out. While the data analysis used is a Test analysis Paired Sample T-Test using the help application IBM SPSS Statistics Subscription in facilitating the calculation of research output.

## Result and Analysis

Research data shows that the use of lego games has a significant influence on the development of creativity in children. The data obtained shows that almost all have increased. The average increase can be seen by analyzing the data before and after giving treatments. The diagram can be presented to see the improvement of each child starting from the pretest and post-test as follows figure 1.

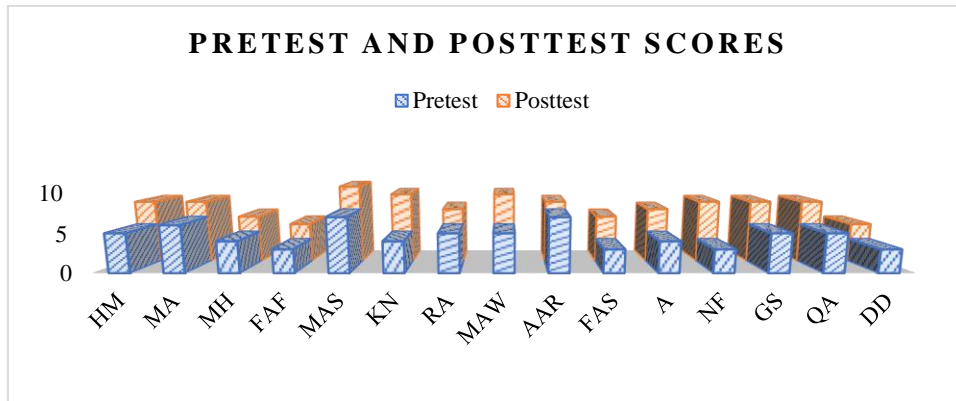


Figure 1. Pretest and Posttest Scores

Tabel 1. Descriptive Statistics

	N	Minimum	Maximum	Means	std. Deviation
Pre_Test	15	3	7	4,60	1,352
Post_Test	15	5	10	7,47	1,457
Valid N (listwise)	15				

Figure 1 clarified using table 1, and it is found that the minimum and maximum pretest values are respectively 3 and 7 while the minimum post-test value is five and the maximum post-test value is 10. The results of the pretest and post-test data can be said to be mutually normally distributed, so a normality test was carried out using the Shapiro-Wilk test because the sample used in this study was less than 50 samples (N<50), which aims to be able to get precise and accurate results.

These results are obtained by looking at the significance value. If the significance value is > 0.05, then the data is normally distributed. If it is like that, then a paired sample t-test will be carried out. However, if the significance value is <0.05, an alternative test will be carried out using the Wilcoxon Test because the data is not normally distributed. This test uses the IBM SPSS Statistics Subscription application. Following are the results of the normality test process using the Shapiro-Wilk test.

Table 2. Tests of Normality

	Class	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistics	Df	Sig.	Statistics	Df	Sig.
Lego Game Results	1	.184	15	.185	.890	15	.067
	2	.243	15	.018	.925	15	.231

a. Lilliefors Significance Correction

These results show that the value of df (degrees of freedom) before and after is 15. The number of data samples for each group is less than 50, so the test is used. Shapiro-Wilk rightly said. Then to take the results of the output above by using the Sig value before the treatment, namely 0.067 and Sig after being given the 0.231 treatment, this proves that the two Sig > 0.05 then take the results from the test Shapiro-Wilk can be concluded that the data is normally distributed and can be continued with the test Paired Sample t-test.

Test paired sample t-test is a test to find the difference in the mean of two samples with different treatments, provided that the data distribution is normally distributed, such as from the output results before and after being given lego games in the development of children's creativity. This test uses the same software as the normality test, namely the IBM SPSS Statistics Subscription Application, with the following results table 3.

Table 3. Paired Samples Statistics

		Means	N	std. Deviation	std. Error Means
Pair 1	Pretest	4.60	15	1,352	.349
	PostTest	7.47	15	1,457	.376

In the data output of Table 3, a summary of the results of the descriptive statistics was obtained from the two samples studied, namely the pretest and post-test for using lego games to increase the development of creativity, the scores of which were respectively between the pretest and post-test, namely 4.60 and 7.47.

Table 4. Paired Samples Correlation

		N	Correlation	Significance	
				One-Sided p	Two-Sided p
Pair 1	PreTest & PostTest	15	.681	.003	.005

Table 4 shows the output of the correlation test between the two pretest and post-test data for using lego games to increase creativity development. Unknown correlation 0.681, the Sig probability value using one-sided 0.003 <0.05 and two-sided 0.008 <0.05. The previous correlation value of 0.681 indicates that the correlation before and after has a strong and positive relationship in using lego games.

Table 5. Paired Sample Test

		Paired Differences					Significance			
		Means	std. Deviation	std. Error Means	95% Confidence Interval of the Difference		Q	df	One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	Pretest – Posttest	-2,867	1.125	.291	-3,490	-2,243	-9,865	14	<.001	<.001

According to the output data in table 5, it is known that the sig value is 0.001 <0.05, so it can be said that there is a difference in the average pretest and post-test results. It indicates that there is a significant difference. Therefore  $H_0$  rejected and  $H_a$  accepted means that there is a significant influence on children's creativity using lego games.

## Discussion

Research on the use of lego games in increasing children's creativity was conducted in October with five meetings, namely a pretest, three times treatments, and a post-test. The sample in this study were 5-6-year-old children at TK Aisyiyah ABA Konang Glagah Lamongan, totalling 15 children. Before conducting research at TK Aisyiyah ABA Konang Glagah Lamongan, the researcher asked permission from the head of the kindergarten.

At the first meeting, the researchers held a pretest or initial observation of children using indicators that had been designed and found that subjects FAF, FAS, NF, DD, A, KN, and MHadlow scores among their friends. Researchers obtained this using two tests through student worksheets colouring a picture flower garden. The test is also used when performing post-test. Nothing is different between the pretest and post-test, so we can determine whether there is an influence before and after treatments.

Treatment in this study was carried out for three consecutive days. Treatment first started by giving the child the to make a house using lego games with the model ocean toy block container 256 pcs. On the second day of treatment, the children were introduced to a slightly tricky lego model, namely lego bricks, to make a game they saw in their schoolyard, and the last day of treatment was to make whatever they wanted using lego sticks.

This research has proven that lego games can increase creativity in children aged 4-5 years. It was proven before the treatment of children when given activities regarding their skills. They still copied many activities, their friends were reluctant to create according to their imagination, and there was also the same from an existing example that did not want to add any more shapes. Not only in terms of self-confidence, but if the activities are monotonous, they will feel bored, so when learning various things such as tracing, cutting, and colouring, children will prefer to talk to their friends from here it is evident that the lack of creativity in children.

Because creativity is needed to face the future due to increasingly tight global competition, creativity has many uses for one's life and society's life because, without creativity, life will not progress either individually or in society (Viridianasari, 2021). As is well known, creativity is a characteristic of individuals according to their environment to bring up new ideas and innovative products from creative individuals.

Creativity can be an artistic pursuit or a synthesis of ideas that results in more than a summary (Sitepu, 2019). Creativity may be in several ways, such as making new patterns by combining information obtained through previous experience so that it is used as a thing to create new situations (Mariyaningsih & Hidayati, 2020). Creativity must fulfill a function and not just follow fantasy. The resulting form is in the form of art or procedural, or methodological.

Therefore, in this study, it can be concluded that children's creativity has increased after being presented with learning resources using Lego games. It is because children are so excited and happy using Lego games as a learning resource during the learning process. Following the treatment given in this study using lego games as a learning resource, they were not only used during breaks. They began to improvise when assembling and forming legos according to the teacher's order. This lego formation activity is also adjusted to the theme used during learning, not just forming the lego game.

This lego is a game tool that can foster children's imagination and creativity because it instils a love of learning in children and motivates them to work. Following the opinion of Jean Piaget and Lev Vygotsky, children construct their knowledge through reflection on their experiences. Therefore lego is called a constructive game, as well as blocks or other constructive games (Acesta, 2019). Lego is a toy used to make buildings, cars, animals, etc. This was disclosed by Ismail (Kartini & Susilawati, 2018).

Each lego game model must require the ability to find the right shape of the block both in size and shape and how to work it in pairing it (Marifah, 2018). It can be a reason to grow self-confidence in children. They start thinking about the use of colour and suitability in creating their models. This lego media is a game almost the same as block media, which has similarities in its constructive nature so that children can build something with the available lego or block media (Maulida et al., 2018).

This lego game is designed to increase children's creativity and fine motor skills for children aged 4-5 years (Rahmandany, 2020). It is obtained following research which proves that lego games can significantly influence creativity in early childhood. In addition, children can also recognize mathematical concepts such as heavy, light, long, short, big, small, high, and low.

Following the description of the discussion, the learning process that uses lego is only centred on the students, not on the teacher, but the teacher is only someone who gives understanding to children to create processes according to the passion of children in developing their creative potential. Therefore, one of the exemplary efforts to achieve the goal is to implement and practice one of the media that can stimulate, such as lego.

The proper stimulation to be given to children should be in the form of learning activities that are fun and interesting, make children comfortable so that learning does not feel monotonous and will make it more effective. It is reinforced by a statement from Lloyd & Howe, which explains that children will not set a time to play alone or engage in certain activities (Wahyu & Sari, 2013). Similar to Miarso's opinion that learning media is a tool that can be used to convey messages and can stimulate thoughts, feelings, and attention in order to increase children's learning motivation and provide a planned and managed learning process (Sapriyah, 2019).

Because if you use suitable media to stimulate children's development, then it will be one of the strategies that can be offered to bring out the effect of happiness for children in doing work and provide support for children to be even more creative. The goal is to be able to express children's creative talents through encouragement from learning media. Following a study by Howard Jones, who conducted research on 52 children aged six years and they were invited to play lego for 25 minutes. The results showed that children who played lego had a higher level of creativity than children who were not given Lego games (Kartini & Sujarwo, 2014). Thus the discussion of the research results obtained by researchers to determine the level of success of lego games in increasing the development of children's creativity at Kindergarten Aisyiyah ABA Konang Glagah Lamongan which shows a significant influence on increasing the development of children's creativity, therefore Lego games are an excellent choice to encourage creative power children.

## Conclusion

As with the results of the research above, this study concluded that there was an influence of lego games in improving the cognitive development of children aged 4-5 years at TK Aisyiyah ABA Konang Glagah Lamongan. It is evidenced by the average results of when pretest and post-test, each of which has a value of 4.60 and 7.47, then analyzed using test paired t-test output the probability value, namely Sig by using one-sided  $0.003 < 0.05$  and two-sided, namely  $0.008 < 0.05$ . it indicates that  $H_0$  rejected and  $H_a$  accepted means that there is a significant influence on increasing the development of children's creativity by using lego games.

## Declarations

### Author contribution statement

Id'ha Tutfi Ulkhatiata conceived the presented idea and developed the theory of early childhood education, lego games, and creativity. Sigit Purnama verified the analytical methods. All authors discussed the results, and contributed to the final manuscript.

### Funding statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

### Data availability statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

### Declaration of interests statement


The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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