

# The Effectiveness of the Games Approach on Learning Outcome of the Squat Style Long Jump in Elementary School Students Gender-Based

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## ABSTRACT

The research objective was to determine the effectiveness of the game approach on the learning outcomes of Squat Style Long Jump. The type of research used was quantitative with the true experimental design method. The population in this study amounted to 49 students, with a random sampling technique. Data was collected using tests. Data analysis in this study consists of tests for normality, homogeneity, homogeneity tests for the variance-covariance / box – M matrix, multicollinearity tests, and hypotheses. The results of the research based on testing using the SPSS application show that the experimental group's score is better than the control group simultaneously and partially based on the pretest & posttest, which shows a significance value of <0.05, meaning that the playing approach used in this study can improve learning outcomes of Squat Style Long Jump and demonstrate its effectiveness by a score of 75 from students who have joined the experimental group. The teacher can use the result of the study as guidance for long jump learning.

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## 1. INTRODUCTION

One of the competencies that must be mastered by students in the curriculum for learning physical education and sports is the long jump. The long jump is a movement whose implementation requires speed, jumping power and goals directed at the correct movement skills in making the movement and the jump's distance (Sobarna, 2020). The simplest long jump style to be taught to beginners, such as students in elementary school, is the squat style long jump. The squat style long jump technique is one of the simplest compared to the other styles (Widiastuti & Hutumo, 2018). However, in the process of achieving these competencies, students are still not optimal, and the level of long jump movement ability is still low.

Tanjung Batu public elementary school's long jump learning process observation data for the 2021-2022 school year reveals some remaining hurdles. Because the teachers' directions do not carry out each squat-style long-jump movement and students do the jump without squatting, student factors

show that the motivation to learn the long jump, especially the squat style, is still low. There is still a lot of uncertainty among students regarding jumping. The long jump using the squat technique still has a lower learning value than the criteria for teaching mastery. However, interviews with educators revealed that they lack the precision necessary to accurately identify effective education methods. Students liked to play during sports lessons, as shown by the discussion findings. Children in elementary school need their recess time. He spends essentially all of his time in play. There are no sandboxes or other learning facilities to encourage long jump sports, and teachers do not engage children with a playful attitude.

These results suggest that primary school pupils may benefit from a learning strategy called the "play approach," which emphasises play while acquiring new knowledge. Students are expected to develop these skills through play in order to successfully master the squat-type long jump. As a result, engaging classrooms require the imaginative efforts of teachers. Long jump learning model, kids can learn effectively, efficiently, and enjoyably through game activities, according to the findings of other studies (Tiza et al., 2018; Sumantri, 2015). Elementary school students can acquire the fundamentals of throwing motion with the help of a game-based learning strategy (Setiawan, Syamsuramel, & Aryanti, 2021). Students should engage in locomotor exercises, including jumping, through routine activities like traditional games. Because of their familiarity, people in Indonesia often turn to traditional games to supplement their education in physical exercise (Syaflin et al., 2021; Sari, 2019). In addition to fostering players' imaginative capacities (Oboeuf, Hanneton, Buffet, Fantoni, & Labiadh, 2020), traditional games can be a useful media programme for enhancing primary school children's fundamental motor capabilities (Akbari, Abdoli, Shafizadeh, & Khalaji, 2009).

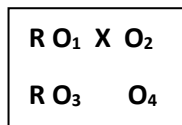
Moreover, many studies have shown the effectiveness of games on physical health and sports learning activities. Game-based learning helps students improve problem-solving skills and enables them to interpret society, nature, and the world through experience. Games provide information in a relevant context or setting (Ucus, 2015). Even game activities can build student collaboration and motivation (Chen & Law, 2016) (Winatha & Setiawan, 2020; Siburian & Mahmud, 2022). According to teachers, play-based learning presents ongoing challenges related to finding and designing a variety of play activities and adapting their learning to students' needs and interests (Avdiu, 2019). The teacher can also provide peer squat exercises done in pairs to make the learning process fun (Kadir et al., 2021).

From this understanding, it can be assumed that games can have an impact on improving the long jump squat style abilities of elementary school students, just as traditional games can have an impact and improve learning outcomes in the squat style long jump (Burhanuddin, Risal, & Jumareng, 2022a; Nasution, Tarigan, & Tanjung, 2022). Even other research has developed a squat-style long jump learning model using games (Defliyanto, Asmawi, Pelana, & Yarmani, 2020a). Media that can be used to play games in long jump learning are tires and cardboard (Endrawan & Sasmarianto, 2021). However, this study presents a game approach concept that is different from previous studies. The games used to improve learning outcomes in the squat-style long jump are four relay balls, hide jumps, rabbit jumps and sack races as research gaps. The four types of games have been identified in the preliminary research, together with the identification of the difficulty of learning the squat style long jump. So, this game is liked by students, and they often do it when playing outside of school. This is a novelty related to the game used for this research. This research was carried out experimentally because it wanted to test the effectiveness of the game approach according to the needs of students, the characteristics of the student's living area, and the available learning facilities.

The research objective was to determine the effectiveness of the game approach on the learning outcomes of Squat Style Long Jump. There are four relay balls, hide jump, rabbit jump and sack race. The results of this study are expected to contribute to teachers' understanding of developing physical health and sports learning approaches, such as games. This means that the results of this study can be a contributor to the development of the quality of learning sports according to the level of student needs and the characteristics of elementary school students.

## 2. METHODS

This study used a true experimental design, meaning that the sample used for the experiment and the control group were chosen randomly from a certain group of people. A pretest-posttest control group strategy was used for the study, as explained below. (Sugiyono, 2018) (Creswell, 2012):



Picture 1 Pretest-Posttest Control Group Design

Note;

R = Random X = Treatment / experiment

O<sub>1</sub>; O<sub>3</sub> = Pretest O<sub>2</sub>; O<sub>4</sub> = Posttest

It analyzed the impact of the game's approach on the learning outcomes of Squat Style Long Jump. There are 4 types of game approaches, including relay ball, hide jump, rabbit jump and sack race. This research was conducted at Tanjung Batu 13 Public Elementary School located in Pajar Bulan Village, Tanjung Batu District, Ogan Ilir Regency, South Sumatra Province. The research was conducted from August to November 2022, which included 12 experiments and 2 squat-style long jump tests (pretest-posttest) in both the experimental and control groups. The population in this study were fifth-grade students at SD Negeri 13, Tanjung Batu, in the 2022/2023 academic year, with a total of 49 people. The sample in this study was taken using a simple random sampling technique. Class V.A. was the experimental group, and class V.B. was the control group. The details of the population can be seen in the following table.

**Table 1.** Population

Class	Gender		Total
	Male	Female	
1. VA	14	12	26
2. VB	12	11	23
Total	26	23	49

Data collection techniques were carried out through a long jump squat style test (pretest-posttest). Tests for measuring the long jump ability in the squat style of students in the experimental and control groups were carried out as follows:

- a. Students leave before the pedestal beam, and the jump is still legal.
- b. On taking off, the first leg must land on the same foot (on which it took off).
- c. On the second leg kick, he must land on the other foot and push off with that foot for the third or final push.
- d. If the student is doing a jump, he hits the ground with his (passive) swing leg, this is counted as a failure.
- e. Assessing, the distance of the jump is measured from the inside of the kicking board to the mark on the sand produced by the body parts.

The results of the long jump in the squat style of the students are then interpreted using the 5-limit norms as follows.

**Table 2.** Norm Range

	Norm Range	Category
1.	$\geq M + 1,5 SD$	Very well
2.	$M + 0,5 SD \text{ s.d } M + 1,5 SD$	Well
3.	$M - 0,5 SD \text{ s.d } M + 0,5 SD$	Currently
4.	$M - 1,5 SD \text{ s.d } M - 0,5 SD$	Not enough
5.	$< M - 1,5 SD$	Less once

Data analysis in this study consisted of tests for normality, homogeneity, homogeneity tests for the variance-covariance / box – M matrix, multicollinearity tests, and hypotheses. The normality test was carried out using the Kolmogorov-Smirnov Z formula. The homogeneity test was carried out using Leven's test, if the analysis results show a p-value > 0.05, then the data is homogeneous. The box–M test was conducted to test whether the data on the two dependent variables have the same matrix of variances for the independent variables. If the sig value obtained is > 0.05, it means that the dependent variable has the variance–covariance as the independent variable. Vice versa if the sig value < 0.05. The multicollinearity test with SPSS uses the VIF (Variance Inflation Factor) or tolerance guidelines, where the VIF value is the opposite of the tolerance value (VIF = 1/tolerance). Hypothesis testing using Multivariate Variance. If the sig value is < 0.05, it can be concluded that H0 is rejected. Otherwise, if the sig value is > 0.05, then H0 is accepted.

### 3. FINDINGS AND DISCUSSION

The below was the result of normality and homogeneity.

**Table 3.** Normality Result Analysis Using *Kolmogrov-Smirnov*

		Experiment group		Control Group	
		Pretest	Posttest	Pretest	Posttest
N		26	26	23	23
Normal Parameters <sup>a</sup>	Mean	49.9992	50.0000	50,0026	49,9987
	Std. Deviation	9.79850	9.79867	9.76915	9.76970
Most Extreme Differences	Absolute	.088	.096	.151	.087
	Positive	.088	.096	.151	.083
	Negative	-.068	-.055	-.105	-.087
Kolmogorov-Smirnov Z		.447	.487	.725	.415
Asymp. Sig. (2-tailed)		.988	.971	.670	.995

In the experimental and control group columns, the value of Asymp. Sig (2-tailed) in the pretest and posttest columns was > 0.05, so it was stated that the measurement data in the experimental group were normally distributed. While the result of the homogeneity test is shown in the following table.

**Table 4.** Levene's Test Homogeneity Test

	F	df1	df2	Sig.
Pretest	1.050	1	24	.316
Posttest	3.097	1	24	.091

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Gender

Table 4 concludes that the pretest and posttest data are homogeneous and it can be said that the data has a reliable value that can be used for hypothesis analysis. Then, the result of the box–M test is presented in the following table;

**Table 5.** Homogeneity Test of Variant-Covariance/Box-M Matrix

Box's M	87.751
F	13.603
df1	6
df2	15330.859
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Group

Table 5 shows the Box's-M value of 87.751 with a significance of 0.000. Because the significance value is  $0.000 < 0.05$ , accept  $H_0$ , which states that the covariance variance matrix is homogeneous. Furthermore, multicollinearity testing was also carried out as a condition in Multivariate Variance to test whether the dependent variable in the experimental and control groups was linear. The way to find out whether a linear variable exists is to look at the Tolerance and VIF values of each independent variable, and if the Tolerance value is  $> 0.10$  and the VIF value is  $< 10$ , then the data is free from symptoms of multicollinearity. The results of the multicollinearity test are in the following table.

**Table 6.** Multicollinearity Testing

Model	Collinearity Statistics	
	Tolerance	VIF
1 Pretest	.227	4.406
Posttest	.206	4.849

a. Dependent Variable: Kelompok

Table 6 shows the tolerance values for each variable  $> 0.10$  and  $VIF < 10$ . So, the variables in the study do not show any symptoms of multicollinearity for Multivariate Variance. The following are the results of hypothesis testing from the experimental and control groups, whether viewed simultaneously or partially.

**Table 7.** Simultaneous Experimental Group Hypothesis Testing

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Relay ball	.998	4161.313 <sup>a</sup>	3.000	22.000	.000
	Hide jump	.002	4161.313 <sup>a</sup>	3.000	22.000	.000
	Rabbit jump	567.452	4161.313 <sup>a</sup>	3.000	22.000	.000
	Sack race	567.452	4161.313 <sup>a</sup>	3.000	22.000	.000
Gender	Relay ball	.859	44.599 <sup>a</sup>	3.000	22.000	.000
	Hide jump	.141	44.599 <sup>a</sup>	3.000	22.000	.000
	Rabbit jump	6.082	44.599 <sup>a</sup>	3.000	22.000	.000
	Sack race	6.082	44.599 <sup>a</sup>	3.000	22.000	.000

a. Exact statistic

b. Design: Intercept + Gender

In Table 7, in the column for sex (gender), the relay ball value shows a positive value of 0.859 with a significance of 0.000. Increasing this value gives a significant value to the model, or there is a significant average difference between groups of data. The hide jump value is 0.141 with a significance of 0.000, meaning there is an average difference between abilities based on gender. Likewise, the rabbit

jump and sack race root each obtained a value of 6.082 and a significance of 0.000. Based on the four tests, it shows a significance value of <0.05.

**Table 8.** Partial Experimental Group Hypothesis Testing

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Posttest	16100.867 <sup>b</sup>	1	16100.867	121.383	.000
	Pretest	14937.069 <sup>c</sup>	1	14937.069	108.143	.000
Intercept	Posttest	515817.175	1	515817.175	3888.706	.000
	Pretest	372121.684	1	372121.684	2694.118	.000
Gender	Posttest	16100.867	1	16100.867	121.383	.000
	Pretest	14937.069	1	14937.069	108.143	.000
Error	Posttest	3183.479	24	132.645		
	Pretest	3314.970	24	138.124		
Total	Posttest	576717.000	26			
	Pretest	423253.000	26			
Corrected Total	Posttest	19284.346	25			
	Pretest	18252.038	25			

a. R Squared = ,002 (Adjusted R Squared = -,040)

b. R Squared = ,835 (Adjusted R Squared = ,828)

Table 8 shows an overview of univariate model testing. The significance value of the pretest <0.05 and the significance value of the posttest <0.005 which means that there are differences in the results of the long jump squat style between female and male students based on the pretest and post-test.

**Table 9.** Simultaneous Control Group Hypothesis Testing

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Relay ball	.999	7008.024 <sup>a</sup>	3.000	19.000	.000
	Hide jump	.001	7008.024 <sup>a</sup>	3.000	19.000	.000
	Rabbit jump	1106.530	7008.024 <sup>a</sup>	3.000	19.000	.000
	Sack race	1106.530	7008.024 <sup>a</sup>	3.000	19.000	.000
Gender	Relay ball	.994	1010.608 <sup>a</sup>	3.000	19.000	.000
	Hide jump	.006	1010.608 <sup>a</sup>	3.000	19.000	.000
	Rabbit jump	159.570	1010.608 <sup>a</sup>	3.000	19.000	.000
	Sack race	159.570	1010.608 <sup>a</sup>	3.000	19.000	.000

a. Exact statistic

b. Design: Intercept + Gender

Table 9, in the gender column, the relay ball value shows a positive value of 0.994 with a significance of 0.000. Increasing this value gives a significant value to the model or there is a significant average difference between groups of data. The hide jump value is 0.006 with a significance of 0.000

which means there is an average difference between abilities based on gender. Likewise, the rabbit jump and sack race obtained a value of 159.570 with a significance of 0.000. Based on the four tests, it shows a significance value of <0.05.

**Table 10.** Partial Control Group Hypothesis Testing

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Posttest	13193.755 <sup>b</sup>	1	13193.755	559.213	.000
	Pretest	12763.710 <sup>c</sup>	1	12763.710	539.139	.000
Intercept	Posttest	373830.277	1	373830.277	15844.674	.000
	Pretest	345450.667	1	345450.667	14591.836	.000
Gender	Posttest	13193.755	1	13193.755	559.213	.000
	Pretest	12763.710	1	12763.710	539.139	.000
Error	Posttest	495.462	21	23.593		
	Pretest	497.159	21	23.674		
Total	Posttest	394371.000	23			
	Pretest	365175.000	23			
Corrected Total	Posttest	13689.217	22			
	Pretest	13260.870	22			

a. R Squared = ,004 (Adjusted R Squared = -,044)

b. R Squared = ,964 (Adjusted R Squared = ,962)

c. c. R Squared = ,963 (Adjusted R Squared = ,961)

Table 10 provides an overview of univariate model testing. The significance value of the pretest <0.05 and the significance value of the posttest <0.005, which means that there are differences in the results of the squat style long jump between students in the control group with female and male gender based on pretest and posttest.

**Table 11.** Simultaneous Experiment - Control Group Hypothesis Testing

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Relay ball	.997	4659.340 <sup>a</sup>	3.000	45.000	.000
	Hide jump	.003	4659.340 <sup>a</sup>	3.000	45.000	.000
	Rabbit jump	310.623	4659.340 <sup>a</sup>	3.000	45.000	.000
	Sack race	310.623	4659.340 <sup>a</sup>	3.000	45.000	.000
Group	Relay ball	.607	23.154 <sup>a</sup>	3.000	45.000	.000
	Hide jump	.393	23.154 <sup>a</sup>	3.000	45.000	.000
	Rabbit jump	1.544	23.154 <sup>a</sup>	3.000	45.000	.000
	Sack race	1.544	23.154 <sup>a</sup>	3.000	45.000	.000

a. Exact statistic

b. Design: Intercept + Group

Table 11 in the group column (experimental-control) for each type of game, a positive relay ball value of 0.607 is obtained with a significance of 0.000. An increase in this value gives a significant value to the model or there is a significant difference in the average increase between the experimental group and the control group. The hide jump value is 0.393 with a significance of 0.000 which means that there is an average difference between the squat style long jump results based on the experimental and control groups. Likewise, for the rabbit jump and sack race, each of them obtained a value of 1.544 with a significance of 0.000. Based on the four tests, it shows a significance value of <0.05. Thus, the increase in squat-style long jump results using a playing approach in the experimental group was more significant than in the control group.

**Table 12.** Partial Control-Experiment Group Hypothesis Testing

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Posttest	15.092 <sup>b</sup>	1	15.092	.023	.881
	Pretest	3854.110 <sup>c</sup>	1	3854.110	5.494	.023
Intercept	Posttest	753649.786	1	753649.786	1124.033	.000
	Pretest	923438.845	1	923438.845	1316.255	.000
Group	Posttest	15.092	1	15.092	.023	.881
	Pretest	3854.110	1	3854.110	5.494	.023
Error	Posttest	31512.908	47	670.487		
	Pretest	32973.564	47	701.565		
Total	Posttest	788428.000	49			
	Pretest	971088.000	49			
Corrected Total	Posttest	31528.000	48			
	Pretest	36827.673	48			

a. R Squared = ,477 (Adjusted R Squared = ,465)

b. R Squared = ,000 (Adjusted R Squared = -,021)

c. R Squared = ,105 (Adjusted R Squared = ,086)

Table 11 shows the results of univariate model testing. In the pretest column, the significance value was > 0.05, which means that there was no difference in the initial long jump squat style ability between the experimental and control groups. Next, the posttest column has a significance value of <0.05, which means that there is a difference in the final squat style long jump ability between the experimental and control groups.

Hypothesis testing revealed that 1) female and male students in the experimental group performed differently on the long jump squat style pretest than those in the control group, and 2) female and male students in the experimental group performed differently on the long jump squat style posttest when using a playing approach. Simultaneous testing indicated that the experimental group employing the playing technique significantly improved their performance on the long jump squat style. The findings of the tests for the control group were also comparable. Therefore, the strategy of play that improves long-squat jumping is effective.

In addition, the wide range of excitement for squat-style long-jump training is a direct outcome of the variety of games used. Since doing the same exercises over and over can get boring, it's important to mix things up from time to time during practice to prevent boredom and keep you going strong. The

squat long jump has had variable degrees of success across different sports. Also, the long jump was an area where men and women clearly diverged. Therefore, the long jump squat method is of varying importance to different male and female students, who are also motivated by various sports. Athletes' squat style and long jump abilities vary depending on the game. Many studies have shown that video games can have a positive effect on students' growth because of the opportunities they present for expression, connection, and collaboration that they present (Purwatiningsih et al., 2013; Sumantri, 2015; Novita Sari et al., 2019; Defliyanto et al., 2020; Burhanuddin et al., 2022).

This finding is consistent with the findings of other studies. The findings of this study (Jospiah, 2017) suggest that a more lighthearted approach can be effective in improving students' long-jumping abilities. According to Wibowo and Hartati's (2021) research, teaching the long jump in physical education classes by including games has improved students' performance. However, Hufron (2022) shows that students' long- and short-term learning outcomes improve when using assistive technology. When it comes to teaching and learning the squat-style long jump, the usage of learning aids could be beneficial for both teachers and pupils.

Results from the squat-style long jump were also examined in another study that employed a circuit training game model (Suhdy et al., 2019; Hermassi et al., 2020; Belli et al., 2022). As a result, the use of media tools can boost performance in the squat-style long jump (Hufron, 2022). Students' cognitive, psychomotor, and emotional learning outcomes were enhanced when Lanos (2019) used cardboard games and recycled tyres to teach them how to squat-style long jump. Research on the effects of employing cardboard instruments for teaching long-jump sports (Endrawan & Sasmariato, 2021) came to a positive conclusion. Regarding the execution approach and its principles, Suharnoko and Firmansyah (2018) employ a mirror jump game that is defined by these elements. It follows that the game is a viable option for a teaching model at the primary school level. In addition, Amirudin (2019) and Prasetyo (2016) found that using games to practise long jump skills made the practice more enjoyable for the students.

#### 4. CONCLUSION

The results of the data analysis concluded that the use of various types of games positively impacted learning outcomes in the squat-style long jump. Each type of game and the gender differences of students provide different results on the long jump ability. However, the findings of this study indicate that different games for squat-style long jump exercises have different impacts on student learning outcomes. Likewise, with gender differences, male and female students have different squat style long jump learning outcomes in each type of game. So these findings provide an understanding to teachers that the characteristics of the game are a consideration that must be considered when used as a long jump learning model. The physical condition and background of students must also be used as material for analysis in selecting learning models.

This study's findings suggest that elementary school PE and sports teachers should be able to think outside the box when it comes to developing game models for physical activity and addressing the shortage of school-owned learning facilities and infrastructure. Delivery Each school's kids have unique needs, therefore, it's important that physical activities be tailored to them to ensure that they're able to fully absorb the information being taught. Furthermore, since every school has restrictions on physical education, students can take advantage of group or individual games to engage in physical activities or sports.

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