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The Influence Of Sack And Engklek Racing Games On Gross Motor Ability Grade Iv Elementary School Students In Trenggalek District

Endi Irawan
Universitas Nusantara PGRI Kediri
Atrup
Universitas Nusantara PGRI Kediri
Wasis Himawanto
Universitas Nusantara PGRI Kediri

Correspondence Author: endiirawan77@gmail.com

Abstract

The Effect of Sack Racing Games and Engklek Games on the Gross Motor Skills of Grade IV Elementary School Students in Trenggalek District.Gross motor skills are the basis for mastering movement skills that support physical activity, physical fitness, and student development. The results of observations show that the coordination, balance, agility, and speed of grade IV elementary school students in Trenggalek District have not developed optimally. This study aims to analyze the influence of sack racing games, the influence of engklek games, and the difference in the influence of the two games compared to ordinary PJOK learning on students' gross motor skills. This study uses a quasi experiment method with a pretest-posttest control group design. The research sample amounted to 32 students, consisting of 14 students of SDN 1 Ngantru as the experimental group I, 9 students of SDN 2 Ngares as the experimental group II, and 9 students of SDN 3 Dawuhan as the control group. The research instrument used a Motor Ability Test which included shuttle run, tennis ball throw to the wall, stork stand positional balance, and 30-meter sprint. It was concluded that sack racing games and engklek games were effective in improving the gross motor skills of elementary school students.

Keywords: sack racing game, knuckle game, gross motor skills, traditional game, elementary school.

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INTRODUCTION

Elementary school is an important stage in the development of students, not only in the academic aspects but also in physical, social, emotional, and movement skills. At the age of 6–12 years, neuromuscular development allows the child to learn a variety of movement skills through directed physical activity. Therefore, Physical Education, Sports, and Health (PJOK) learning has an important role in providing a systematic movement experience according to the characteristics of student development. Physical education contributes to the development of motor skills, mastery of movement skills, fitness, and student participation in physical activities (Robinson et al., 2020; Barnett et al., 2022). Motor abilities do not develop automatically, but they require planned exercise, diverse movement experience, and proper feedback. Magill and Anderson (2021) explain that movement learning is formed through repetitive practice that results in adaptation and skill improvement. Gross motor skills are also the basis for the mastery of more complex movement skills and are related to children's fitness and participation in physical activities (Lloyd et al., 2019).

However, the increasing use of digital technology, limited play space, and changes in children's activity patterns can reduce the opportunity to move so that motor development is not optimal.This condition was found in an initial observation in February 2026 at SD Negeri 1 Ngantru, SD Negeri 2 Ngares, and SD Negeri 3 Dawuhan on 32 grade IV students. The observation results showed that about 60% of students had difficulty with coordination, 56% balance, 53% agility, and 47% speed. Interviews with PJOK teachers also showed that there are still difficulties in performing movements that require coordination and balance, such as jumping, jumping, throwing, and catching. This condition shows the need for more active, varied, and in accordance with the characteristics of students.

From *a motor learning* perspective, variations in movement experience can improve adaptability, retention, and skill transfer. Therefore, PJOK learning needs to provide opportunities for students to learn through interesting, challenging, and meaningful activities (Magill & Anderson, 2021). One of the suitable alternatives is traditional games, since they are easy to implement, use simple means, are fun and are able to increase student involvement in physical activities. Traditional games can also develop the motor, social, emotional, and cognitive aspects of students (Maryati et al., 2023; Pramudyanto et al., 2023; Nurdiana et al., 2023). This study chose sack and engklek racing games because they both have different movement characteristics. Sack racing emphasizes jumping using both legs, bilateral coordination, dynamic balance, and explosive movements. Meanwhile, the ankle emphasizes one-foot jumps, changes of direction, unilateral balance, and postural control. These differences in characteristics are estimated to produce

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different influences on students' gross motor skills. This study has novelty in the form of comparing the effectiveness of sack and engklek racing, the use of *quasi experimental* design with the control group, and the measurement of gross motor ability using the Motor Ability Test (Nurhasan, 2007) which includes speed, agility, coordination, and balance. The study was conducted to analyze the influence of the two games and compare the improvement of gross motor skills between sack, engklek, and control racing groups in grade IV elementary school students in Trenggalek District. The results of the study are expected to provide empirical evidence and become a reference for PJOK teachers in developing active, interesting, and developmental characteristics of students.

RESEARCH METHODS

This study uses a quantitative approach with *a quasi-experimental* method. The quantitative approach was chosen because the study aims to test the influence of sack racing games and engklek games on students' gross motor skills through measurements expressed in the form of numerical data and analyzed using statistical techniques. The *quasi-experimental* method is used to determine the causal relationship through the provision *of treatment* to the experimental group without randomizing the subjects.

According to Creswell and Creswell (2023), *quasi-experimental* research is experimental research that uses a naturally formed group (intact group), so that researchers do not randomize subjects into experimental groups or control groups. Nevertheless, the research is still carried out through a systematic procedure to control external variables so that the effect of treatment on the bound variables can be objectively observed.The research design used is *Pretest–Posttest Control Group Design*. This design allowed researchers to measure students' gross motor skills before and after treatment, as well as compare changes in gross motor skills between the experimental group and the control group. Thus, the effectiveness of each treatment can be analyzed more comprehensively.The study involved three groups, namely the experimental group I who received treatment in the form of a sack racing game, the experimental group II who received treatment in the form of an engklek game, and the control group who participated in PJOK learning as usually carried out in schools. All groups followed a pretest before treatment and a posttest after all treatments were completed using the same measurement instrument. To increase the internal validity of the research, several control efforts were carried out, namely: (1) the learning duration in each group was equalized for 60 minutes per meeting; (2) treatment is given four times; (3) the instruments used during the pretest and posttest are the same; (4) the

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implementation of the measurement is assisted by two testers who have received briefings on the procedure for conducting the test; and (5) the entire group follows a uniform measurement procedure. These efforts are made to minimize the influence of external variables so that the changes in gross motor ability that occur more reflect the influence of the treatment given.

Figure 3.1 Research Design

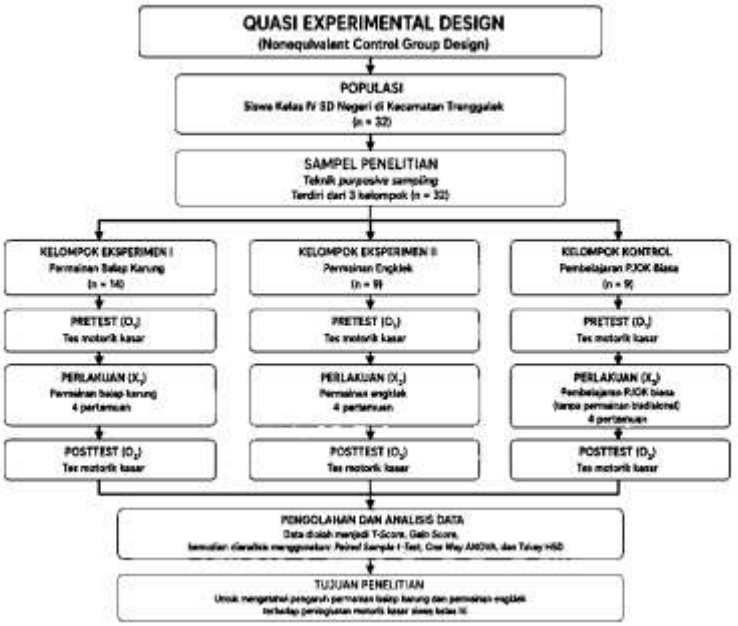


Table 3.1 Pretest-Posttest Control Group Design

Groups	Pretest	Treatment	Posttest
Experiment 1 (Sack Racing)	O_1	X_1	O_2
Experiment 2 (Engklek)	O_3	X_2	O_4
Controls	O_5	-	O_6

Description:

O_1, O_3, O_5 : *Pretest* of gross motor ability (before treatment)

X_1 : Treatment in the form of a sack racing game

X_2 : Treatment in the form of a game of engklek

O_2, O_4, O_6 : *Posttest* of gross motor ability (after treatment)

Source: Adapted from *Creswell & Creswell (2023).*

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The Pretest–Posttest Control Group Design was chosen because it was able to provide an overview of changes in gross motor ability before and after treatment and allowed a comparison of the effectiveness of sack racing games, engklek games, and PJOK learning in the control group. Therefore, this design is considered suitable to achieve the research objectives, which are to analyze the influence of sack racing games and engklek games on the improvement of gross motor skills of grade IV elementary school students in Trenggalek District.

RESULTS

Table 4.1 Distribution of Research Subjects

Groups	Male	Women	Quantity
Experiment I (Sack Racing) SD 1 Ngantru	6	8	14
Experiment II (Engklek) SD Negeri 2 Ngares	4	5	9
Control (Ordinary PJOK Learning) SD 3 Dawuhan	4	5	9
Total	14	18	32

Based on Table 4.1, the research subjects consisted of 14 male students (43.75%) and 18 female students (56.25%). The number of research subjects in the first experimental group was 14 students, while the second experimental group and the control group amounted to 9 students each. The difference in the number of subjects in each group is due to the number of grade IV students who meet the research criteria at each school. Although the number of subjects in each group is not the same, all groups receive instruments, measurement procedures, and treatments according to the research design so that the research results can still be compared based on the quasi-experimental design used. Gross motor ability was measured using the Motor Ability Test developed by Nurhasan. This instrument consists of four components, namely agility (shuttle-run 4 × 10 meters), coordination (throw to catch the ball for 30 seconds), balance (stork stand positional balance test), and speed (30-meter sprint). The score of each component is then converted into a T-score so that all components have the same unit.

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Table 4.2 Statistical Description of Gross Motor Ability Experimental Group I (Sack Racing Game)

Variable	N	Red	Std. Deviation
Pretest	14	193,2190	25,58798
Posttest	14	217,3855	26,15598

Based on Table 4.2, the average gross motor ability of students in the experimental group I increased from 193.2190 at the time of the pretest to 217.3855 at the time of the posttest, or an increase of 24.1665 points. The standard deviation in the pretest was 25.58798, while in the posttest it was 26.15598, which indicates that the data spread in both measurements was relatively uniform. Descriptively, these results showed an increase in gross motor skills after students participated in learning using sack racing games. To find out if the increase is statistically significant, tests are then carried out using the Paired Samples t-Test.

Table 4.3 Statistical Description of Gross Motor Ability Experimental Group II (Engklek Game)

Variable	N	Red	Std. Deviation
Pretest	9	177,5253	25,31640
Posttest	9	197,2917	23,14045

Based on Table 4.3, the average gross motor ability of students in the experimental group II increased from 177.5253 at the pretest to 197.2917 at the posttest, or an increase of 19.7664 points. The standard deviation in the pretest was 25.31640, while in the posttest it was 23.14045, which indicates that the data spread in both measurements is relatively uniform. Descriptively, these results show an increase in gross motor skills after students participate in the engklek game. To find out if the increase is statistically significant, tests are then carried out using the Paired Samples t-Test.

Table 4.4 Statistical Description of Gross Motor Ability of the Control Group (Ordinary PJOK Learning)

Variable	**N**	**Red**	**Std. Deviation**
Pretest	9	199,9979	29,13135

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Posttest	9	199,9917	29,32304

Based on Table 4.4, the average gross motor ability in the control group was relatively fixed, from 199.9979 at the pretest to 199.9917 at the posttest. Based on the gain score, the control group had a mean of −0.0063, which showed almost no improvement in gross motor ability during the study. Descriptively, the control group did not show an improvement in gross motor ability as the two experimental groups. On the other hand, the average gross motor ability score decreased after participating in PJOK learning as usual. Therefore, statistical analysis was then carried out to find out whether the changes were significantly different compared to the group that received the treatment of sack racing games and engklek games.

Figure 4.1 Comparison Chart of Pretest, Posttest, and Gain Scores of Gross Motor Ability Between Groups

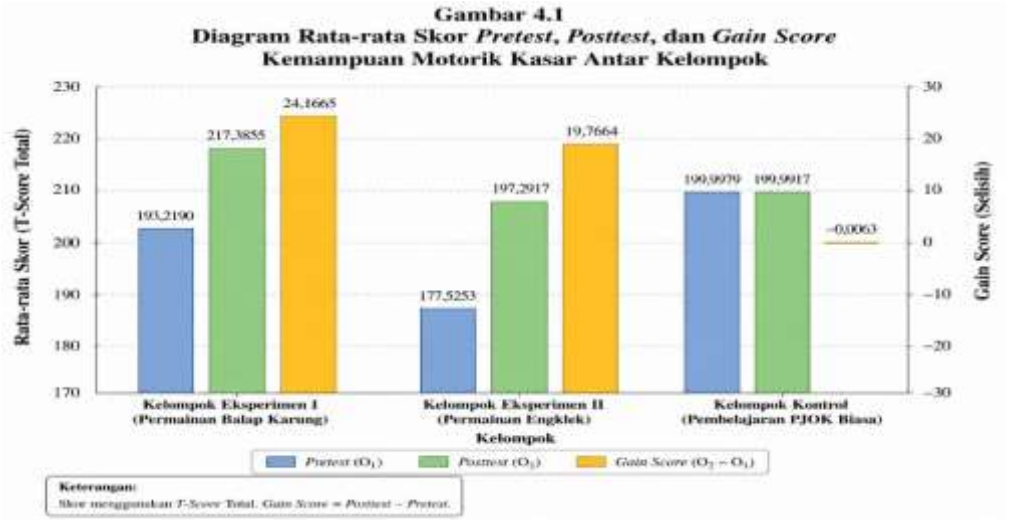


Table 4.5 Comparison of Average Pretest, Posttest, and Gain Scores of Gross Motor Ability Between Groups

Groups	Pretest	Posttest	Differences
Experimental Group I (Sack Racing Game)	193,2190	217,3855	24,1665
Experimental Group II (Engklek Game)	177,5253	197,2917	19,7664

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Control Group (Ordinary PJOK Learning)	199,9979	199,9917	−0.0063

Based on Figure 4.1 and Table 4.5, experimental group I experienced an increase in average gross motor ability from 193.2190 to 217.3855 with a gain score of 24.1665. Experimental group II increased from 177.5253 to 197.2917 with a gain score of 19.7664. Meanwhile, the control group had an average pretest of 199.9979 and a posttest of 199.9917, with a gain score of −0.0063, indicating almost no improvement in gross motor ability.

Descriptively, experimental group I showed the highest increase in gross motor ability, followed by experimental group II. Meanwhile, the control group did not show an improvement in gross motor skills during the study period, but instead experienced a decrease in average scores. These findings indicate that the application of traditional games, especially sack racing games and engklek games, provides a better improvement in gross motor skills compared to PJOK learning as usual.

However, the results in Figure 4.1 and Table 4.5 are still descriptive so they cannot be used as a basis to conclude the effect of treatment statistically. Therefore, the analysis is continued with a prerequisite test which includes a normality test and a homogeneity test before hypothesis testing using an analysis technique that is in accordance with the characteristics of the research data. Descriptive statistical output that is the basis for the preparation of Table 4.2 to Table 4.5 Analysis Prerequisite Test Results

Table 4.6 Normality Test Results Gain Score for Gross Motor Ability

Groups	Shapiro-Wilk Statistics	df	Sig.	Remarks
Experimental Group I (Sack Racing Game)	0,942	14	0,445	Normal
Experimental Group II (Engklek Game)	0,934	9	0,518	Normal
Control Group	0,873	9	0,132	Normal

Based on Table 4.6, the experimental group I obtained a significance value of 0.445, the experimental group II of 0.518, while the control group of 0.132. All groups had a significance value greater than 0.05, so it can be concluded that the gross motor ability gain score data in the three study groups was normally distributed. These results show that the assumption of normality has been met. Therefore, hypothesis testing regarding differences in gross motor ability

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improvement between groups can be carried out using parametric statistical analysis, namely One-Way ANOVA, while still paying attention to the results of the homogeneity test

Table 4.7 Results of the Gross Motor Ability Homogeneity Test

Living Statistic	df1	df2	Sig.	Remarks
0,441	2	29	0,648	Homogeneous

Based on Table 4.7, the Levene Statistic value of 0.441 with a significance value of 0.648 was obtained. Because the significance value is greater than 0.05, the variance of gross motor ability gain score in the experimental group I, the experimental group II, and the control group is declared homogeneous. These results show that the homogeneity assumption has been met. Together with the results of the normality test showing that all groups are normally distributed, all the prerequisites of parametric analysis have been met. Therefore, hypothesis testing regarding the difference in gross motor ability improvement between groups was carried out using One-Way ANOVA. If the results of the One-Way ANOVA show a significant difference, the analysis is continued with Post Hoc Tukey HSD to determine significantly different group pairs.

Table 4.8 Results of Paired Sample T-Test Experimental Group I
(Sack Racing Game)

Variable	Red	N	Std. Deviation	Std. Error Mean
Pretest	193,2190	14	25,58798	6,83867
Posttest	217,3855	14	26,15598	6,99048

Mean Difference	t	df	Sig. (2-tailed)
-24,16654	-28,186	13	0,000

Based on Table 4.8, the value of t = -28.186 with the value of Sig. (2-tailed) = 0.000. Since the significance value is less than 0.05, H_{01} is rejected and H_{11} is accepted. Thus, the game of sack

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racing has a significant effect on the gross motor skills of grade IV elementary school students. Descriptively, the average gross motor ability increased from 193.2190 at the time of the pretest to 217.3855 at the time of the posttest, or an increase of 24.1665 points. These results show that the sack racing game is effective in improving students' gross motor skills.

Table 4.9 Results of Paired Sample T-Test Experimental Group II
(Engklek Game)

Variable	Red	N	Std. Deviation	Std. Error Mean
Pretest	177,5253	9	25,31640	8,43880
Posttest	197,2917	9	23,14045	7,71348

Mean Difference	t	df	Sig. (2-tailed)
-19,76641	-13,073	8	0,000

Based on Table 4.9, the value t = -13.073 with the value Sig. (2-tailed) = 0.000. Since the significance value is less than 0.05, H_{02} is rejected and H_{12} is accepted. Thus, the engklek game has a significant effect on the gross motor skills of grade IV elementary school students.

Descriptively, the average gross motor ability increased from 177.5253 at the time of the pretest to 197.2917 at the time of the posttest, or an increase of 19.7664 points. These results show that engklek games are effective in improving students' gross motor skills. Complete Output Test Paired Samples t-Test Group Engklek Games

Table 4.10 One-Way ANOVA Gross Motor Ability Gain Score Test Results

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3366,634	2	1683,317	122,730	0,000
Within Groups	397,754	29	13,716		
Total	3764,388	31			

Based on Table 4.10, the value of F = 122.730 was obtained with a significance value (Sig.) of 0.000. Since the significance value is less than 0.05, H_{03} is rejected and H_{13} is accepted. Thus,

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there was a significant difference in the improvement of gross motor skills between the sack racing game group, the engklek game group, and the control group. To find out the group pairs that had a significant difference in gross motor ability improvement, a follow-up test was carried out using Post Hoc Tukey HSD.

Table 4.11 Post Hoc Tukey HSD Follow-Up Test Results

Group Comparison	Mean Difference	Sig.	Remarks
Sack Racing – Engklek	4,40014	0,025	Significant differences
Sack Racing – Control	24,17283	0,000	Significant differences
Engklek – Control	19,77270	0,000	Significant differences

Based on Table 4.11, all pairs of groups had a significance value of less than 0.05, so each showed a significant difference in gross motor ability. The mean difference showed that the sack racing game group had a higher increase in gross motor skills than the engklek game group and the control group. In addition, the engklek game group also showed a significantly higher increase in gross motor skills than the control group.

These results are in line with descriptive statistical analysis which shows that the sack racing game group obtained the highest gain score of 24.1665 points, followed by the engklek game group of 19.7664 points, while the control group had a gain score of -0.0063, which indicates almost no improvement in gross motor ability during the study. Thus, sack racing games provided the greatest improvement in gross motor skills, followed by engklek games, while PJOK learning without the application of traditional games did not provide an improvement in gross motor skills during the study period.

Table 4.12 Summary of Hypothesis Test Results

No.	Hypothesis	Analytical Techniques	Nilai Sig.	Verdict
1	There is an influence of the sack racing game on the gross motor skills of grade IV elementary school students.	Paired Samples t-Test	0,000	H_{01} rejected, H_{11} accepted
2	There is an influence of the engklek game on the gross	Paired Samples t-Test	0,000	H_{02} rejected, H_{12} accepted

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	motor skills of grade IV elementary school students.			
3	There is a difference in the influence of sack racing games, engklek games, and ordinary PJOK learning on the gross motor skills of grade IV elementary school students.	One-Way ANOVA	0,000	H_{03} rejected, H_{13} accepted

Based on Table 4.12, the first hypothesis obtained a significance value of 0.000 (< 0.05) thus showing that the game of sack racing has a significant effect on the gross motor ability of grade IV elementary school students. The second hypothesis also obtained a significance value of 0.000 (< 0.05), so that the game of engklek has a significant effect on the gross motor ability of grade IV elementary school students. Furthermore, the results of the One-Way ANOVA showed a significance value of 0.000 (< 0.05), so there was a significant difference in gross motor ability improvement between the sack racing game group, the engklek game group, and the control group. The results of further tests using Post Hoc Tukey HSD showed that all group pairs had significant differences. Based on the results of the analysis, the sack racing game group showed the highest increase in gross motor skills, followed by the engklek game group, while the control group had the lowest increase in gross motor skills.

DISCUSSION

The results of the study showed that the game of sack and engklek racing had a significant effect on the gross motor skills of grade IV elementary school students. Sack racing increased gross motor skills by 24.1665 points, while engklek by 19.7664 points, with a significance value of 0.000 ($p < 0.05$). The improvement has to do with the characteristics of the movement in the game. Sack racing trains speed, agility, balance, coordination, and strength of the leg muscles through repetitive jumping movements. Meanwhile, engklek emphasizes balance, coordination, and movement control. This is in accordance with the Theory of Motor Learning of Magill and Anderson (2021), that movement skills develop through repetitive and directed exercise. The results of the One-Way ANOVA also showed significant differences between the sack, ankle, and control racing groups ($F = 122.730$; $p = 0.000$). The sack race gave the highest increase, followed by the engklek, while the control group had almost no improvement. Results *Post Hoc Tukey HSD*

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showed that both traditional games are more effective than ordinary PJOK learning. Thus, sack and engklek racing games can be used as an alternative to PJOK learning, with sack racing showing the greatest influence on improving students' gross motor skills.

CONCLUSION

Based on the results of the research and discussion that has been described in the previous chapter, it can be concluded as follows. The Effect of the Sack Racing Game on Gross Motor Skills has been proven to have a significant influence on the gross motor skills of grade IV elementary school students. The results of the Paired Samples t-Test showed a significance value (Sig. (2-tailed)) of 0.000 ($p < 0.05$), so there was a significant difference between gross motor ability before and after treatment. Descriptively, the average gross motor ability increased from 193.2190 to 217.3855, or an increase of 24.1665 points. Thus, the sack racing game can be used as one of the effective PJOK learning alternatives to improve the gross motor skills of elementary school students. The Influence of Engklek Games on Gross Motor Skills has been proven to have a significant influence on the gross motor skills of grade IV elementary school students. The results of the Paired Samples t-Test showed a significance value (Sig. (2-tailed)) of 0.000 ($p < 0.05$), so there was a significant difference between gross motor ability before and after treatment. Descriptively, the average gross motor ability increased from 177.5253 to 197.2917, or an increase of 19.7664 points. Therefore, engklek games can be used as an alternative to PJOK learning that is able to support the improvement of gross motor skills of elementary school students.

Differences in the Influence of Sack Racing Games, Engklek Games, and Ordinary PJOK Learning on Gross Motor Skills The results of the One-Way ANOVA show that there is a significant difference in the influence between sack racing games, engklek games, and ordinary PJOK learning on the gross motor skills of grade IV elementary school students, with a significance value (Sig.) of 0.000 ($p < 0.05$). The results of further tests using Post Hoc Tukey HSD showed that all group pairs had significant differences. The sack racing group showed the highest increase in gross motor skills with a gain score of 24.1665 points, followed by the engklek game group of 19.7664 points, while the control group had a gain score of −0.0063 which showed almost no improvement in gross motor skills. Thus, the game of sack racing provides a higher increase in gross motor ability in the context of this study. However, both traditional games have proven to be more effective than regular PJOK learning in improving the gross motor skills of grade IV elementary school students.

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IMPLICATIONS

1. Theoretical Implications

   The results of this study provide empirical support for the Motor Learning Theory which explains that movement skills develop through a training process that is carried out repeatedly, directed, and accompanied by feedback. The improvement of gross motor skills that occurred in the sack racing and engklek game groups showed that varied movement experiences that were carried out consistently were able to improve students' ability to coordinate movements, maintain balance, and control body movements.

2. Practical Implications

   For PJOK teachers, the results of this research can be used as an alternative in designing more active, varied, and student-centered learning. Sack racing games can be used to develop speed, agility, coordination, balance, and strength of leg muscles, while ankle games are more suitable for practicing balance, coordination, motion control, and movement precision. The use of both games alternately and integrally can enrich students' movement experience according to learning objectives.For schools, the results of this research can be the basis for integrating traditional games into PJOK learning and co-curricular activities as an effort to improve the quality of learning, increase students' physical activity, and preserve traditional games as part of local culture.Overall, the results of the study show that sack racing games and engklek games are suitable for use as PJOK learning strategies to improve the gross motor skills of elementary school students. Between the two games, the sack racing game provides a higher increase in gross motor skills, but both have proven to be more effective than regular PJOK learning.

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