The Effect of Game-Based Circuit Training Model and Leg Length on 60-Meter Sprint

Agusta Margono[1✉] , Soegiyanto[2] & Udi Utomo[2]

[1] Public Elementary School 1 Jobokuto, Jepara, Jawa Tengah, Indonesia
[2] Universitas Negeri Semarang, Indonesia

Article Info

Abstract

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The design of training for children is required to be creative and innovative. One of them is making game-based learning. The purpose of this study was to determine the effect of game-based circuit training models and leg length on the speed of a 60-meter sprint run of students at Jobokuto 1 Elementary School, Jepara. This study uses a sample of grade IV students Jobokuto 1 Elementary School, Jepara, with a total of 38 students. Data collection techniques using sprint 60-meter sprint test. The research method uses experimental research so that the data analysis technique used is the Anova formula with a significance level of 0.05. The results of the research test. There is a difference in the effect of training circuit training with the play model on the result of the sprint speed of 60-meters. There is a difference of influence of leg length with low limb and leg category to result of sprint speed of 60. There is an interaction between the training circuit training method and the leg length to the result of the sprint speed of 60-meters. The conclusion that can be drawn from the results of this study is the athletic game of the color play model is feasible and acceptable or used in the lesson penjasorkes athletic learning materials in Elementary School.

✉ Correspondence address:
  Yos Sudarso No. 26 RT.01/RW.01, Jobokuto,
  Jepara, Jawa Tengah, 59416
  E-mail: agusta8145@yahoo.com

INTRODUCTION

Sports Education material that is considered boring by students is the branch of Athletics. Athletics is physical activity or physical exercise which includes normal things like walking, running, jumping and throwing (Ditjen Olahraga Depdiknas, 2001). These movements were known by primitive nations in prehistoric times to survive.

Athletics is a sport that is quite popular in Indonesia. The term athletics comes from the Greek "Athlon" which means to compete. Running is one of the athletic branches that are often contested. In general, the race category consists of the sprint, middle, and long distance. In the running branch, there are several techniques that must be learned. A runner must master the way to start, how to run, and how to enter the finish line. A person's physical condition strongly influences athletics, the physical condition that the researcher will study again is the leg length. Physical education is still considered by some parents to be unimportant, even though physical education and academic achievement complement each other, and adequate physical activity can not only improve students' mental and physical health but can improve student learning abilities (Yi Ching, and Huang, 2012).

Samsudin (2008) on the material structure of penjasorkes at 4-6 grade elementary school includes the activities of bodybuilding, sports game and modification, life skills in the wild, and personal life skills (physical fitness and attitude and behavior formation).

Athletics is a sport that is quite popular in Indonesia. The term athletics comes from the Greek "Athlon" which means to compete or compete." Running is one of the athletic numbers that is often contested. In general, the running race category consists of short distance sprint, medium distance running, long-distance running. In the run number, there are several techniques to be learned. A runner must master the way to start, how to run, and how to enter the finish line (Yudha, 2003). A person's physical condition strongly influences athletics, the physical

condition that the researcher will study again is the length of the leg.

Related to the conditions, it is necessary to have training innovations that can develop students' physical abilities to have good physical abilities. The training innovation is to use circuit training models. Circuit training is one exercise model that combines several exercises into one training unit consisting of several posts where the training objectives for each post can be different or can be the same.

Circuit training requires setting the right intensity of training because this exercise requires relatively large energy considering that students must carry out training tasks in several posts. Students are very interested in colors. Shofa Afriyani Fajrin (2014) stated: "there is an influence on cognitive development and student psychomotor on color that makes students interested in doing an activity with pleasure and not felt."

According to research, one of the things that cause a decrease in student fitness is the lack of student desire to move. In essence, the world of students is a playful world. Seto Mulyadi (2006), a student psychologist, explained that student is a student, a student is not a small-sized adult. Therefore the learning method of a student must be adjusted to its development. The student world is a world of play that supports student learning, namely, functional or sensorimotor play, role-playing, and constructive play.

Exercise for students must be created as creative and innovative as possible. Game-based exercise is a fun and challenging exercise. Psychologically students are unique and very dynamic because students will be easily attracted to and bored with something. To anticipate the boredom of the student, the exercise needs to be well designed, namely by using color game-based circuit training. In this exercise, students will be required to conquer all challenges to develop their physical abilities, which indirectly this exercise can help grow student development optimally.

A preliminary study conducted by (1) Ade Septiana in 2017 entitled The Effect of Circuit Training Exercise on Sprint Running 50 Meters Students, concluded that circuit training had a

significant effect on the increase in student sprint speed of 50 meters. The second training circuit training can improve students' physical condition at 50 meters. (2) Yogi Metra in 2014 entitled The Effect of Fartlek Exercise on Student's 60-meter Run Ability concludes that Fartlek exercises have a significant effect on increasing the students' 60-meter sprint speed. The second Fartlek exercise can increase the 60-meter running speed. (3) Ahmad Ulil Albab in 2012, entitled Game of Color Move to train the motion of basic techniques of karate sports, concluded that the move color game had a significant effect on improving the physical condition of students. Athletics is a sport that is quite popular in Indonesia. The term athletics comes from the Greek "Athlon" which means to compete. Running is one of the athletics branches that are often contested. In general, the running race category consists of the sprint, middle, and long distance. In the running branch, several techniques must be learned. A runner must master the way to start, how to run, and how to enter the finish line. Athletics is strongly influenced by a person's physical condition, one of which is a leg length.

The objectives of this research are: (1) To study and analyze the differences in the effect of game-based circuit training models with color media and colorless on the speed of a 60-meter sprint run (2) to assess and analyze differences in long leg and short leg on the speed of a sprint run 60-meter (3) To analyze the interaction between training circuit and leg length training methods on the speed of a 60-meter sprint run..

METHODS

This research uses factorial design. According to Sugiyono (2015) factorial design is a modification of true experimental design, namely by observing the possibility of a moderator variable that affects the treatment (independent variables) of the variable (dependent variable).

The population of this study is all of Elementary School Jobokuto 1 student at Yos Sudarso No.26, Jobokuto, Jepara. The population in this study were eight classes with a total population of 284 students. The sampling technique in this research uses purposive sampling. Purposive sampling is one of the non-random sampling technique where the researcher determines the sampling by determining the specific characteristics that are suitable with the research objectives so that it is expected to answer the research problem, with the criteria: aged 10-12 years, amounting to 38 students.

This study uses experimental research and uses ANOVA as data analysis. From the comparison of the circuit training method with the color and colorless game-based model on the speed of the 60-meter sprint run, it is known that each independent variable is used as an experiment consisting of four variables, while the dependent variable is the leg length (long leg and short leg). Based on this, the hypothesis testing will be carried out with a 2x2 ANOVA two-way factorial arrangement and hypothesis testing with the F test calculation with a significance level of $\alpha = 0.05$. Requirements required in variance analysis are Kolmogorov Smirnov test and homogeneity test using the Levene's test. Data analysis using the SPSS 2010 program.

RESULTS AND DISCUSSION

The results of the study of the influence of the game-based circuit training model and leg length on a 60-meter sprint run, which was carried out on 23 sd. July 28, 2018, held at Elementary School Jobokuto 1 Jepara are as follows:

Table 1. Sample Normality Test Results at the 0.05 Significance Level

	Kolmogorov-smirnov[a]			Shapiro-wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
A_1B_1	.325	5	.092	.768	5	.044
A_1B_2	.225	5	.200*	.884	5	.329
A_2B_1	.206	5	.200*	.935	5	.631
A_2B_2	.244	5	.200*	.815	5	.108

a. Lilliefors Significance Correction
*. This is a lower bound of the true significance.

The normality test is done by using the Kolmogorov-Smirnov test with SPSS (Sulaiman, Wahid. 2004). The results of the test calculations are complete can be seen in Table 1 below. In

table 4, it can be seen that the Asymp value of Sig of all groups is higher than the significance level of 0.05, so it can be concluded that the data from each sample group is normally distributed.

Table 2. Homogeneity Calculation Results using SPSS 2010 with General Linear Model

Levene statistic	df_1	df_2	Sig.
.673	1	18	.423

The homogeneity test of population variance was carried out using the Levene test's SPSS 2010 analysis procedure General Univariate General Linear Model. The table above shows that the significance level = 0.423 is higher than the significance level of 0.05 so it can be concluded that each group has a variance from a homogeneous population or the same.

Table 3. The Calculation Results of SPSS Version Two-Way Variant Analysis 2010 General Linear Model Univariate Procedure at the Significance Level 0.05

Dependent variable: RUN					
Source	Type III Sum of squares	df	Mean square	F	Sig.
Corrected mModel	.838[a]	3	8.279	14.267	.848
Intercept	2.577.449	1	2.577.449	2,46E+06	.000
Long_legs	7.762	1	7.762	8.728	.406
Training	5.013	1	5.013	7.012	.914
Long_legs * training	5.063	1	5.063	6.060	.809
Error	16.747	16	1.047		
Total	2.595.034	20			
Corrected total	17.585	19			

a. R squared = .048 (Adjusted R squared = -.131)

The 1st hypothesis states that there is an influence between color game-based circuit training and colorless on a 60-meter running result tested by ANOVA and obtained F value = 7.012 with a significance value of 0.05. Calculation results are consulted with F table and numerator = 1 (b-1) and d denominator (kb (n-1)), with a significance level of 0.05 obtained F_{table} = 3.52, because $F_{value} > F_{table}$ or 7.012 > 3.52. So H_a stated: There is an influence between color game-based circuit training and colorless on 60-meters running results Elementary School Jobokuto 1 student Jepara (accepted).

The 2nd hypothesis states that there is an influence between the play model circuit training which has a long leg and short leg on the 60-meter running results tested by ANOVA and obtained F_{value} = 8.728 with a significance value of 0.05. The calculation results are consulted with the F_{table} and the numerator = 1 (b-1) and the denominator (kb (n-1)), with the 0.05 significance level obtained F_{table} = 3.52, because the $F_{value} > F_{table}$ or 8.728 > 3.52. The H_a states: There is influence between the exercise circuit of the play model that has a long leg and short leg against the results of a 60-meter sprint run of students Elementary School Jobokuto 1 (accepted).

The 3rd hypothesis 3 states that there is an interaction between the circuit model playing exercises and leg length against the results of the 60-meter run tested ANOVA and obtained F_{value} = 6.060 with a significance value of 0.05. The calculation result is consulted with F_{table} dk numerator = 1 (b-1) and dk denominator (kb (n-1)), with significance level 0.05 obtained F_{table} = 3.52, because $F_{value} > F_{table}$ or 6.060 > 3.52. Then H_a states: There is an interaction between game-based circuit training model on the speed of the 60-meter sprint run of students Elementary School Jobokuto 1 (accepted).

To increase running speed, strength and agility training is needed. Circuit training is a combination of endurance training and high-intensity aerobics. It is designed to be easy to follow and build muscle strength and endurance targets. When one circuit is complete, one will carry out the next training phase. Generally, interludes between circuit training stages are short, often with quick movements to the next exercise. Circuit training by using interesting learning media can increase student interest. Leg length is an element in determining the appearance of exercise, especially in sports that require height. In this case, the leg length affects the results of running student speed. With a long

step, students can optimize their running movements.

Short-leg length students have different abilities with long-leg length students. Thus, the difference in leg length will give a different effect on the result of the student's running speed. A sprint runner who has a longer leg length can run faster on the leger's short leg runner. Also, the leg length will affect a sprint runner to extend the steps and speed up the rhythm of the steps, because the run speed is generated by the length of the steps and the rhythm of the steps. The length of the step is affected by leg length while the rhythm of the step is affected by leg muscle power. The physical condition cannot be separated from any sport, while biological factors have little effect. The results showed that there was an interaction between color game-based circuit training with leg length on the 60-meter run of students Elementary School Jobokuto 1.

CONCLUSION

The results show that. There is a difference in the effect of the color game-based circuit training model on the speed of the 60-meter sprint run of students Elementary School Jobokuto 1. There are differences in the long leg and short leg to the speed of a 60-meter sprint of students Elementary School Jobokuto 1. There is an interaction between the training circuit and leg length training methods on the speed of a 60-meter sprint run of students Elementary School Jobokuto 1.

REFERENCES

Ditjen Olahraga Depdiknas. (2001). *Model Pengembangan Motorik Anak Pra Sekolah*. Depdiknas. Jakarta.

Fajrin, A. (2014). Pengaruh Perkembangan Baik Kognitif dan Psikomotorik Anak terhadap Warna. *Jurnal Ilmiah PG-PAUD IKIP Veteran Semarang*.

Ulil, A. A. (2012). Upaya Peningkatan Mutu Pembelajaran Olahraga Karate (Teknik Dasar) dengan Permainan Move Colour pada Siswa kelas VIII G SMP Negeri 1 Kota Semarang. Retrieved from http://lib.unnes.ac.id/19497/

Mulyadi, S. (2006). *Psikolog dan Polah Tingkah Anak*. Jakarta. Rineka Cipta

Samsudin. (2008). *Pembelajaran Pendidikan Jasmani Olahraga dan Kesehatan SD/MI*. Jakarta: PT. Bumi Aksara

Sugiyono. (2015). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif dan R&D)*. Bandung: CV. Alfabeta.

Wahid, S. (2004). *Analisis Regresi menggunakan SPSS Contoh Kasus & Pemecahannya*. Yogyakarta: Andi.

Yi, Ching., & Huang. (2012). Physical Fitness and Academic Achievement of Elementary School Students: Across-Sectional Survey in Southern Taiwan. *Journal of Physical Education and Sport,* 12(3), 302-312. Retrieved from http://www.efsupit.ro/images/stories/vol_12_3_Art_45.pdf

Yudha, M. S. (2003). *Pembelajaran Atletik di Sekolah Dasar*. Jakarta: Depdiknas.