

The Effectiveness of Circuit Training-Based Athletic Learning on Physical Fitness

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Abstract

This study aims at examining the effectiveness Circuit Training-based Athletic Learning Model on the physical fitness among IV-grade-students in SDN Gugus Merpati Kecamatan Jepara. It is an experiment research with queasy-experimental design. This study implements *nonequivalent control group*. The population is this research is the whole students in Grade IV SDN Gugus Merpati. The sample is collected through cluster sampling technique where Grade IV SDN Panggang 6 serve as the experiment, while Grade IV SDN Panggang 9 acts as the control class. The data are collected using test and non-test technique. While the data are analyzed with normality test, homogeneity test, and hypothesis test that includes t-test and N-gain test. The findings presented that the homogeneity of the average score from the two class, experiment class and control class, is rejected as the average of the physical fitness in experiment class is higher than control class. N-gain of experiment class (0.5672) > control class (.). In conclusion, Circuit Training-based Athletic Learning Model is more effective than Game-based Tactic Learning to improve the physical fitness of Grade IV students in SDN Gugus Merpati Kecamatan Jepara.

Keywords: Athletic Learning Model, Circuit Training, Physical Fitness

1. Introduction

Education is one of the roads to develop the nation's intellectual life through building the character and develop the learners' potential ability to acquire knowledge and to be useful for the society (Giatman et al., 2020). Based on the Constitution Number 20 Year 2003 Chapter 1 Article 1 Section 1 about National Education System mentions that education is the intentional and planned attempt to create a learning situation and process in order to facilitate the learners to actively develop themselves and acquire the ability of religious spirituality, self-control, strong personality, intelligent, nobility, as well the skills required for the sake of themselves, the society, the state and nation. The compulsory education required in Indonesian National Education System, according to its implementation, is divided into the level of Elementary School, Middle School, and Tertiary Education

Physical Education is given started from in Elementary School level. According to the Constitution Number 3 Year 2005 Chapter 1 Article 1 Section 11 mentioned that physical education taught at schools is the subject that deals with the students' physical exercises and it should be scheduled regularly to gain knowledge, health, personality, skill, and fitness. Therefore, achieving the educational objectives of Physical is the integral elements of education as a whole and it aims at developing the aspects of physical fitness, movement skill, critical thinking ability, social skill, logical thinking, emotional stability, healthy life behavior, and awareness to clean environment though physical, sports, and healthy activities that has been selected and systematically prepared in advance.

Cowell and Hozeltn (Sukintaka) mentioned that in achieving the educational objectives, it is important to improve the physical fitness, social condition, mentality, and morality of the children. Hence, physical fitness is essential in supporting the academic and learning activities of students. In other words, learning activities for students would run well when the students are in the good state of physical fitness. Without a god physical fitness, the learning activities will not run maximally. The issue of non-maximal learning activities is discovered in SDN Gugus Merpati, where the students of Grade IV got easily exhausted during the physical education lesson. It was approved by the PE

teacher statement during the interview that the student did not take the lesson seriously and frequently asked for recess time.

The results of the observation and interview presented that there was no test conducted to examine the students' physical fitness state yet. Test to measure the students' physical fitness is important to do in order to identify the students' fitness level. A good result on physical fitness test will automatically influence on the students' condition level in regard to their learning activity, since those with good physical fitness level may results to higher motivation in learning (Shofwan et al., 2019). Besides, the most common issue discovered is the teachers' lack of knowledge regarding innovative learning models. They are used to implementing relatively conventional learning model that caused students being bored during the lesson. There are many types of Physical Education learning, it may be vary depends on the strategy, technique, method, and learning stages by concerning on the contexts and contents aspects. Context refers to the learning environment prepared to motivate the students and create a fun learning situation both for the students and the teacher. Meanwhile, content deals with the substance from the material that will be taught in the PE lesson such as the parts of the movements, games, gymnastic, outdoor learning, etc. One of the learning models is athletic. It is a kind of learning model that includes several elements like walking, running jumping, and throwing. Mochamad Djumidaar A. Widya (2004) said that athletic is a dominant element in Physical Education that focuses on physical activities, healthy lifestyle, and developing a balanced behavior, social skill, mentality, and emotion. Considering all the statements above, a good and regular exercise method could affect the students' physical condition. There are many kinds of exercise methods, one of them is Circuit Training exercise program which is easy to implement and require short period of time.

Based on the explanation above, the researchers conduct a research titled "The Effectiveness of Circuit Training-Based Athletic Learning on Physical Fitness". This study aims at examining the effectiveness Circuit Training-based Athletic Learning Model on the physical fitness among IV-grade-students in SDN Gugus Merpati Kecamatan Jepara.

2. Methodology

The design for this research used the quasi experimental in the form of non-equivalent control group. The population for this research is the entire students of class IV of SDN Gugus Merpati. The sample collecting technique used the cluster sampling. The variables of this research consists of: (1) independent variable, that is the teaching model of athletics based on the circuit training and the games based tactical teaching model; (2) the dependent variable that is the physical fitness of the students of class IV on the subject of PE. The data collecting technique is done with the testing and non-testing that are observation, interview, and documentation. Data of learning result is analyzed with the t-test and N-gain. The t test is used to prove the average degree of physical fitness by using the teaching model of athletics based on the circuit training more than the average degree of fitness degree with the games based tactical teaching model. The N-gain test used to prove the improvement of average degree of this physical fitness using the teaching model of circuit training based athletics more than the average degree of physical fitness using the games based tactical teaching model upon the physical fitness of the student of Class IV of SDN Gugus Merpati.

3. Findings and Discussion

3.1. Findings and Discussion for Initial Data

The initial data for this research is the following [table 1](#) data score of the pretest of the experimental class and the control class:

Table 1. Data Score of Pretest

Class	Highest Score	Lowest Score	Average
Experimental	72	40	53,5
Control	72	40	53,57

The initial data analysis is used on this research is the normality test and the homogeneity test. Based on the result of the calculation of normality test from the pretest score using the Chi-square on the experimental class gained $\chi^2_{\text{count}} = 3.2033$ and the score of $\chi^2_{\text{table}} = 11.0705$ ($\chi^2_{\text{count}} < \chi^2_{\text{table}}$). The control class gained the $\chi^2_{\text{count}} = 7.3539$ and the $\chi^2_{\text{table}} = 11.0705$ ($\chi^2_{\text{count}} < \chi^2_{\text{table}}$). Therefore, it can be concluded that the pretest data on the experimental and control class indicated that the H_0 is accepted, which means the data is normally distributed. Based on the result of calculation of homogeneity test and the pretest score using the F test gained $F_{\text{count}} < F_{\text{table}}$ so that the H_0 is accepted, which means that the pretest score of the experimental and the control class are homogeneous.

3.2. Analysis Result for the Final Data

The final data of this research is the score data of post-test for the experimental and control class. The data can be seen in [table 2](#):

Table 2 Score Data of the Post-test

Class	Highest Score	Lowest Score	Average
Experimental	96	60	79,875
Control	88	60	73,368

Before the final data analysis, the score data of the post-test tested using the prerequisite test of normality and homogeneity test. Then, the hypothesis test 1 is done, which is difference test on the average (t test) and the hypothesis test 2 of the improvement of average score (N-gain test). The data of the normality test of the post-test using the Chi-square on the experimental class gained the $\chi^2_{hitung} = 2.0830$ and the $\chi^2_{table} = 11.0705$ ($\chi^2_{hitung} < \chi^2_{table}$). The control class gained the $\chi^2_{count} = 10.1884$ and the $\chi^2_{table} = 11.0705$ ($\chi^2_{count} < \chi^2_{table}$). Based on the result of the normality test on the post-test score, it shows the H_0 is accepted that means the data is normally distributed. The homogeneity test of the score of post-test shows the F-test gained the $F_{count} = 1.093859$ and the F_{table} of = 1.761368 with the degree of significance of $\alpha = 0.05$. The score of $F_{count} < F_{table}$ then the H_0 is accepted. Therefore, the data score of post-test for the experimental and control class are homogeneous.

Then, from the data of post-test that is normally distributed and homogeneous, the difference test of average score is done using the T test. The result of the calculation can be observed on [Table 3](#).

Table 3 The Result of Difference Test on the Average

Class	N	Average	t_{count}	t_{table}
Experimental	32	79,875		
Control	38	61,895	8,527	1,995

Based on the [Table 3](#), the score of $t_{count} = 8.527$ and the $t_{table} = 1.995$, then the $t_{count} > t_{table}$, which means that the H_0 is accepted. This explains that the average score on the physical fitness of the students that used the teaching model of athletics based on the circuit training is higher than the average score of the test of physical fitness using games based tactical teaching model on the students of Class IV SDN Gugus Merpati.

Then, the test of improvement of the average using the N-Gain is done. The result of the calculation of the N-Gain can be observed on table 4.

Table 4 The Result of Average Improvement Score

Class	Pretest	Posttest	N-Gain	Criteria
Experimental	13,375	19,9687	0,567	Medium
Control	13,314	18,3421	0,416	Medium

The data of average score improvement on the pretest and post-test of the experimental and control class is presented in Figure 1.

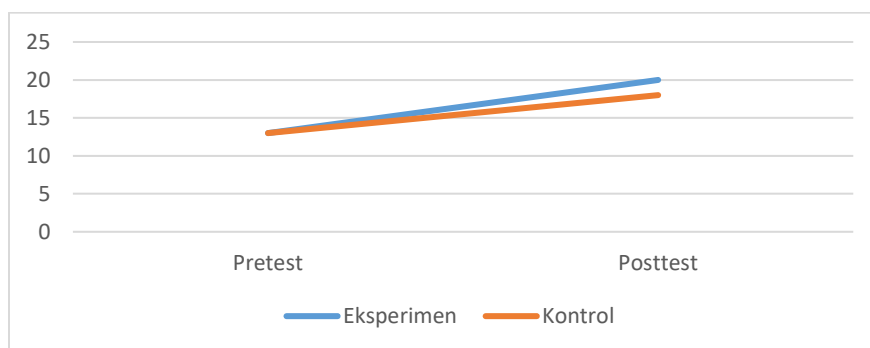


Figure 1 N-gain Diagram

Based on Table 4 and the diagram on Figure 1, the average score of the pretest on experimental class is 13.375 and it increased on the average score of post-test that is 19.9687. The result of N-Gain is 0.567 with the criteria of medium. The average score of the pretest of control class that is 13.314 and it increased to the average score of the post-test with 18.3421. the result of N-Gain on the control class is 0.416 with the criteria of medium. Therefore, the improvement on the average score of the learning result in the experimental class is higher from the improvement of the learning result on the control class.

The difference of the result in the physical fitness test on the experimental and control class is caused by the teaching of the PE using the tactical teaching model based on the game is not yet able to highlight the aspects of basic movements of sports to the students. The students are only focused on playing and competing. In the application of game, it requires a lot of time for the preparation from the warm ups, direction giving, example showing and beginning the game so that the time left for the students to play the game is very limited and the students can only play in a short time due to the division of groups according to the rules of the game. In that case, it can be concluded that it is not accurate if it is used for the material of physical fitness because in its material the students are demanded to move more so that they can gain the goal from the exercise of physical fitness, one of them is to improve their vitality. The weakness is the cause the teaching in the control class is less effective so that the result of the physical fitness test is less satisfying.

According to the Decree of Ministry of Education and Culture (SK Kemendikbud) No: 041/U1987, it explains that athletics is the mother from all kind of fields of sports, this makes athletics is field of sport that is compulsory for education in all level of education, especially in elementary school because in this age athletics basic movement can make the students more active (Djibu & Duludu, 2020). This shows that the teaching of athletics is fundamental to be given in elementary school so that it can attract the students, which needed the innovation of the teachers in teaching. The teachers needed to be motivated and the innovation must be according to the situation, condition and the material delivered. According to Farrell et all (2013), the exercise of fitness is interpreted as the systematic process in using movement that aims to improve or maintain the quality of physical function, those are the quality of endurance of lungs-heart, the power and endurance of muscle, flexibility, and body composition. According to (Sarwono, 2007:111) circuit training is a form of exercise consists of a series of exercise, it is designed to develop the physical fitness and the skill that is related to a particular sport. By applying the circuit training system that can give impact in improving the physical fitness so that the impact caused becomes positive.

This research is supported by the research that have been done by Akhmad Sobarno (2016:15) stated that the athletic model here can be used in improving the pedagogical perspective in teaching. The research of Adi Sumarsono (2017) in his research concluded that the teaching model of athletic is a method that can be classified as effective to be applied in the teaching. The research by Hidayat (2020) in the research concluded that the development of teaching model of athletics that is modified with the game of Fomula 1 can be classified as effective to be applied in the teaching.

To support the application of teaching model of athletics with concept empowerment needed a method or a exercise system. One of the exercise systems in PE in term of physical fitness is the circuit training. This is in line with the research of Suminah (2015) that stated that there is an impact from the circuit training upon the improvement of physical fitness of the students Grade IV of SDN Percobaan 03 of Pakem Sleman. The research done by Ramandhani Ardi Pratiwi (2013) mentioned that by using the circuit training can improve the physical fitness of class V of SDN 7 Merak Batin, Southern Lampung.

4. Conclusion

The conclusion of this research is the average degree of the physical fitness used the teaching model of circuit training based athletics on experimental class is higher than the average degree of physical fitness using the games based tactical teaching model on control class. Also, the improvement of average degree of physical fitness using the teaching model of circuit training based athletics on the experimental class is higher than the improvement of average degree of physical fitness using the games based tactical teaching model in control class. Therefore, it can be concluded that the teaching model of circuit training based athletics is more effective to be used in improving the physical fitness of the students of Class IV of SDN Gugus Merpati.

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