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Effectiveness of physical

by Nurkadri Dkk

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Effectiveness of physical fitness model with game approach in improving physical fitness of students at Gajah Mada elementary school in Medan.

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Abstract. This study to explore the effectiveness of a game-based physical fitness activity model in improving the physical fitness of students in Gajah Mada elementary school at Medan. The game-based physical fitness activity model as the alternative model for sport teacher to increasing desire of students to perform various forms of physical activity as stimulus to increase in cardiorespiratory strength, strength, endurance and flexibility. This study uses a pre-experimental approach methodology in the form of one group pre-test and post-test design, this fact has supported antusiasem of elementary school students during folow the model movemed. To analyse the results of the pre-test and post-test using statistical methods (t-test) to find out the significance effect. Furthermore, the results of this study show that the results of the average value of the post-test are greater than the average value of the pre-test. Thus, it was stated that the physical fitness activity model of students in elementary school at Gajah Mada Medan is effective for use in improving learning outcomes and increasing forms of physical activity as well as cardiorespiratory endurance, strength, endurance and determination of elementary school students.

Keywords: Physical Fitness, Game Approach, Elementary School

1. Introduction

In general physical fitness activities are divided into two forms, namely: healthy, where the body is in a condition free from all diseases. Fit, where the body is able to carry out various optimal daily activities without excessive fatigue and still has an energy reserve.

Physical fitness related to health which contains various forms of motion exercises and forms of cardiorespiratory endurance activity, strength and endurance of muscles and flexibility. Researchers see that physical fitness is very beneficial for the daily lives of students in their activities, therefore a literature study by one of them was from the International Journal of GEOMATE Journal, Nopparak Kaesaman and Wichai Eungpinichpong stated in the study of the acute effects of traditional Thai massage on recovery basketball players are shown through heart rate variability (HRV) and physical fitness. The results of this study showed that HRV and physical fitness had a significant increase in both groups. This shows that the TTM can improve the recovery of basketball players by increasing HRV. [1] It can be concluded that HRV and physical fitness can restore the physical condition of basketball players by using some form of physical fitness activity performed. In this case, it showing



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is very important for the recovery of physical conditions for athletes and students using physical fitness activities. Next, the researchers conducted observations by distributing questionnaires to 50 elementary school physical, sport and health education teachers in Medan city. The results of this distribution can be seen in table 1 below:

Table 1. Results of Questionnaire Dissemination to Physical Education Teachers in Medan City

No	observation points	Yes	No
1	Is physical fitness activities needed by students to do in elementary school?	80%	20%
2	Does physical Education Teacher not provide learning forms of physical fitness activities carried out to students?	84%	16%
3	Do physical Education teachers understand physical fitness activity models for elementary school students?	14%	86%

The data in table 1 stated that as many as 80% or 40 people from 50 physical education teachers that physical fitness activities needed by students are conducted at school. Furthermore, 85% or 42 people from 50 physical education teachers stated that they did not provide learning forms of physical fitness activities carried out to students. And 86% or 43 people from 50 physical education teachers confirmed that they did not understand physical fitness activity models for elementary school students. Based on the preliminary data analysis, the researchers conducted the study by applying a game-based physical fitness activity model that had the extent of the effectiveness of this model of physical fitness activity at the Gajah Mada Elementary School in Medan, Sumatra Utara.

2. literature Review

2.1 Model of Physical Fitness Activities Based on Games for Elementary School Students

The research and development models in this study are Fitness Learning Models (health related fitness models). The learning model developed believes that the success of physical education learning begins with the joy of students in physical activity. So a variety of debriefings such as skills, physical fitness, attitude, knowledge and daily progress are oriented towards individual pleasure and confidence. Then the description of the game-based physical fitness activity model for elementary school students used is as follows:

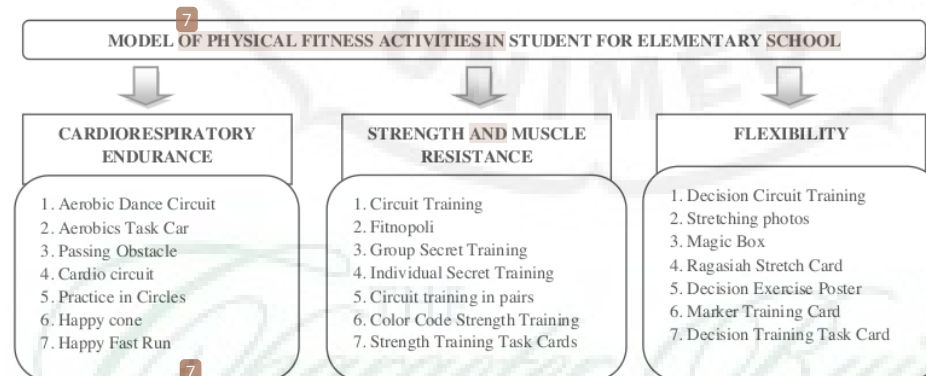


Figure 1. Model Of Physical Fitness Activities In Student For Elementary School.

The use of the learning development model as shown in Figure 1 is based on observational data and the results of the word review or literature which shows that there are still low physical fitness problems accompanied by the lack of development of learning models oriented to physical fitness activities related to health in Medan.

2.2 Motor Learning.

The terms a processes of motion learning have principles that are almost the same as the learning process and can not be separated from the understanding of learning in general. Among Ma'mun and Yudha M. Saputra (2000: 6) argue that there are three stages in motor learning, namely: cognitive verbal stages and the process of making decisions more prominent; the stages of motion have meaning as a pattern of motion that is developed as well as possible so that students or skilled athletes; and the stage of automation means smoothing the movement so that the performance of students or athletes becomes more solid in carrying out their movements. [2] Richard A. Schmidt (1988: 346) which states that learning motion is a series of processes related to practice or experience that lead to relatively permanent changes in a person's ability to display skilled movements. [3] Based on the literacy of Amung and Schmidt, the authors conclude that elementary school students are in the middle childhood and enter the development of motor behavior. Characteristics of motor behavior, namely perfecting basic motion and awareness of motion. Looking at the characteristics of elementary school age children, in learning physical education will be able to develop the skills provided through several models of development of physical fitness activity learning combined with basic motion learning.

2.3 Stage of Children's Motor Ability and Physical Characteristics

Understanding the nature of growth and development in each phase of development, will provide the possibility for teachers to better treat their students. Glee Johnson (2006: 63) argues that locomotor motion is the motion of the entire body through a certain room or distance such as walking, running, jumping and so on. While non-locomotor motion is a movement where only parts of the body move such as pushing, pulling, leaning the body and so on. Manipulative motion is the movement of skills that use equipment such as throwing, catching, striking, kicking, memvoli, etc. [4] According to David L. Gallahue & John C. Ozmun (1998: 81) that the phase of children's motor development.

Physical characteristics of children aged 6-8 years (class I-II) include: Slow reaction time; Active, energetic and happy with rhythmic sounds; Soft bones and easily deformed; The heart is easy in dangerous conditions; A sense of consideration and understanding develops; Coordination of eyes and hands develops, still not able to use smooth muscles properly; Erratic general health. The physical characteristics of the 9-10 year olds (classes III and IV) that they have include: Improved coordination in movement skills; Developing endurance; Fixed growth; Good eye and hand coordination; A bad attitude may be shown. Characteristics of physical body age 10-12 years (classes V and VI) that are owned include: Growth of the muscles of the arms and legs increases; There is awareness of the body; Boys master rough games; Height and weight growth do not vary much. [5]

The researcher argues that the characteristics of elementary school children that need to be considered by physical education teachers. The basis of this understanding is needed as an understanding of the conditions in real elementary school children, then studying physical education is very well done. Students will develop very well from physical, motoric, psychological and sociological aspects if physical education learning is given appropriately according to its characteristics. and provide broadest freedom of movement for students to gain learning experiences and carry out exploration of movement. So that students will master the desired movement skills, then students will be able to improve their motion skills.

2.4 Curriculum for Elementary School Student

Physical education during elementary school, should prioritize the function of organ formation, thus physical education in elementary schools is obliged to develop the function of the body's movement of the body as a whole. Wilma S. Longstreet, and Harolg G. Shane (1993: 63) divided the curriculum design into four designs, namely curriculum design oriented to society, children, knowledge, and curriculum design that was electric in nature. [6] then Anthony A. Annarino et al (: 133) provide curriculum design advice which includes seven activities can be seen in Table 2 below:

Table 2. The Classification of Activities and Time Division of Elementary School of Physical Education Curriculum. [7]

Activity	Grade 1 (%)	Grade 2 (%)	Grade 3 (%)	Grade 4 (%)	Grade 5 (%)	Grade 6 (%)
Aquatic	0-5	0-10	0-5	0-5	5-10	5-10
Game (low organizing)	10-20	20-30	10-20	20-30	20-25	25-35
Rhythmic activity	20-30	20-30	20-30	10-20	15-20	15-20
Self test	15-20	20-30	10-20	20-30	20-30	20-30
Development	5-10	5-10	5-10	5-10	5-10	5-10
Outside class education	5	5-10	5-10	5-10	5-10	5-10
Recreation	5	5-10	5-10	5-10	5-10	5-10

Based on both expert opinions, the implementation of learning in the physical education curriculum emphasizes aquatic curriculum design, game activity design, rhythmic activity design, self-test activity design, design of educational activities outside the classroom, design of development activities and design of recreational activities.

This form of material administration of physical fitness model activities is adjusted to the learning plan in school, and can be seen in the following table:

Table 3. Material physical fitness model activities

No	Meeting	Meeting Material
1	First	Aerobic Dance Circuit, Circuit Training and Decision Circuit Training
2	Second	Aerobics Task Car, Fitnopoly and Stretching photos
3	Third	Passing Obstacle, Group Secret Training and Magic Box
4	Fourth	Cardio circuit, Individual Secret Training and Ragasiah Stretch Card
5	Fifth	Practice in Circles, Circuit training in pairs and Decision Exercise Poster
6	Sixth	Happy cone, Color Code Strength Training and Marker Training Card
7	Seventh	Happy Fast Run, Strength Training Task Cards and Decision Training Task Card

3. Research Methodology

The objectives of this study are as follows: Test the effectiveness of game-based physical fitness activity models for Gajah Mada elementary school students in Medan. Furthermore, it is expected to be an alternative in increasing the desire of students to perform various forms of physical activity as an increase in physical fitness.

This research was conducted at Gajah Mada Medan Elementary School Jln. Bunga Kenanga No. 2 Medan Sumatera Utara at the 5th grade and 6th grade elementary school as many as 40 people. This is conducted for 8 (eight) months, starting from April to November 2015.

The approach and method used in this study are pre-experiment in the form of one group pretest-posttest design. Analyzing the results of the pre-test and post-test using statistical methods (t-test) to find out whether there is a significant effect of the implementation of the physical fitness model.



Figure 2. Research Design in Model Effectiveness Test. (Source: compiled by Researchers)

The instrument used in testing the effectiveness of this model is the ACSPT physical fitness test (Asian Committee on Standardization of Physical Fitness Test) which is a physical fitness test in the field that has been internationally recognized and standardized in Asia. This test aims to determine the level of one's physical fitness. This test is relatively inexpensive and easy to do. The ACSPT physical fitness test is a series of tests consisting of (1) a 50 meter run (dash / sprint) to measure speed; (2) a long jump without a prefix (standing broad jump) to measure the body's explosive movement / muscle explosive power; (3) distance run which is 600 meters for boys and girls less than 12 years old with

the aim of measuring cardiorespiratory resistance; (4) Hanging body (son) or hanging elbows (daughter) to measure static strength and endurance of arms and shoulders; (4) Run back and forth 4x10 meters to measure agility; (5) Sit down (sit up) 30 seconds to measure the endurance of the abdominal muscles, (6) Forward flexion of trunk measures flexibility.

4. Discussion and results

Model implementation by testing the effectiveness of the model. The effectiveness test of the model was conducted using a pre-experimental research design in the form of "one group pretest-posttest design". The students who were the subjects of the study were given a pre-test in the form of a physical fitness test using the Asian Committee on Standardization of Physical Fitness Test (ACSPFT), which was then treated in the form of physical fitness activity models and post-tests using the same test instruments. Descriptions of the results of the physical fitness pre-test and post-test of students can be explained in the following table 4:

Table 4. Results of Physical Fitness Pretest and Posttest Using ACSPFT.

No.	Statistics	Physical Fitness Test Results	
		Pretest	Posttest
1	Number of Samples	40	40
2	Average value	333,20	369,35
3	Range	84	93
4	Standard Deviation	24,24	25,04
5	Minimum Value	293	322
6	Maximum Value	376	414
7	Total	9995	11084

Data on physical fitness pre-test conducted on 40 students obtained an average value of 333.20 with a standard deviation of 24.24 and a range of values obtained by a value of 84 from the difference between the lowest score of 293 the highest score of 376, and obtained the total value of 9995. While the physical fitness post-test data conducted on 40 students obtained an average value of 369.35 with a standard deviation value of 25.04 and the range value obtained a value of 93 from the difference between the lowest score of 321 scores the highest is 414, and a total value of 11084 is obtained. The following are presented scores of physical fitness test results of students in the form of a diagram can be seen the average and standard deviation from the results of the pre-test and post-test as follows.

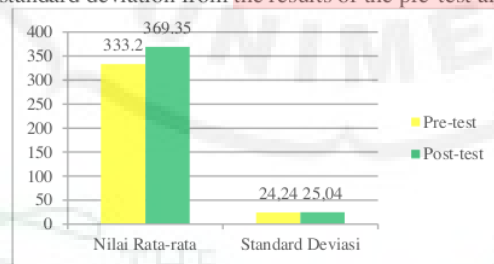


Figure 3. Average Value Diagram and Standard Deviation of Pretest and Posttest Results of Physical Fitness

Figure 3 shows results of differences in the average values between the two physical fitness test results, showing that the average value of the post-test results is higher than the average value of the pre-test results. As proof of the significance of the implementation of physical fitness activity models for students on improving physical fitness of students, it is necessary to statistical testing with a "t-test". Before the data was analyzed, a normal test was conducted on the data from the pre-test and post-physical fitness test using the Lilliefors test at a real level $\alpha = 0.05$. While the summary of the calculation results is shown in Table 4 below:

Table 5. The Summary of Calculation Results of Data Normality Test in Pre-test and Post-test in Physical Fitness of Students.

Test Result	n	L _o	L _t	Result
Pretest	40	0,12	0,16	Normal
Posttest	40	0,09	0,16	Normal

Description:

n = Test number

L_o = Price L-count

L_t = Price of L-table at the real level $\alpha = 0.05$

Based on the results of the calculation of the normality test as shown in Table 4, it is obtained that the price of L_o for all physical fitness pre-test and post-test data of students is smaller than the L_t at the real level $\alpha = 0.05$. Thus it can be concluded that all student physical fitness pre-test and post-test data came from populations that were normally distributed. This conclusion implies that parametric statistical analysis can be used to test the hypothesis proposed in this study, so that the condition for testing hypotheses has been fulfilled. More details can be described as follows: (1) The results of the calculation of the normality test using data in the form of physical fitness pre-test results in students, where the number of samples 40 obtained L_h is = 0.12 and L_t = 0.16 with a significant level $\alpha = 0,05$. Thus, because L_h is less than L_t, it can be concluded that the overall physical fitness pre-test data of students comes from populations that are normally distributed; and (2) The results of the calculation of the normality test using data in the form of physical fitness post-test results for students, where the number of samples 40 obtained L_h is = 0.09 and L_t = 0.16 with a real level $\alpha = 0.05$. Thus, because L_h is less than L_t, it can be concluded that the overall posttest physical fitness data of students comes from populations that are normally distributed.

The normality tests have been conducted on the results of physical fitness pre-tests and post-tests of students using ACSPT. Then the effectiveness test is carried out by using the "t test". Completing calculation of the steps to test the effectiveness of the application of physical fitness activity learning models to Gajah Mada elementary school students in Medan using the "t-test" technique. Meanwhile, the summary of the calculation results can be seen in Table 5 below:

Table 6. Summary of the Effectiveness Test Results of the Physical Fitness Test with t-Test.

	Average Physical Fitness Test Results		t count (t _o)	t tabel (t _t)
	Pretest	Posttest		
	333,20	369,35	15,56	2,05

The results of the effectiveness test using the t-test, from the difference in physical fitness test results using ACSPT between the pre-test and post-test obtained the price $t_0 = 15.55$ greater than the price $t_t = 2.05$ (at the 0.05 significance level), then null hypothesis rejected. So that it can be concluded that, there are significant differences between the pre-test and post-test results of the physical fitness test. In addition, the average value of the pre-test results = 333.20 is smaller than the average post-test results = 369.35. It was stated that the physical fitness activity learning model for elementary school students was effectively carried out as an increase in physical fitness for students of the Gajah Mada elementary school in Medan.

5. Conclusion

The result of the effectiveness of the physical fitness learning model for the Gajah Mada elementary school students in Medan, North Sumatra can be summarized as follows: From the results of the Evability test of physical fitness learning models using the ACSPT physical fitness test, which shows the results of the average value of the Post-test greater than the average value of the Pre-test. It was stated that physical fitness activity models for students in the Gajah Mada elementary school Medan Sumatera Utara are effective to use in improving learning outcomes and increasing forms of

physical activity such as cardiorespiratory endurance, strength, endurance and determination of elementary school students.

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