

CARDIORESPIRATORY EXERCISE MODEL BASED WASTE UTILIZATION FOR ELEMENTARY SCHOOL STUDENTS

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Abstract

The goal to be achieved from this development research is to produce products in the form of waste utilization model books for elementary school students so as to provide guidance for physical education teachers in providing fun, creative and meaningful learning. This study used research and development (RnD) method from Borg and Gall consisting of ten steps, the subjects used in this study were students of SDN Tanjungsari and SDN Blanakan with a total of 68 subjects. The design of the experiment research is one group pretest posttest design. The stages of this study are: introduction research, expert test, large group test small group test and effectiveness test. The effectiveness test in this study used the Harvard Step Test. The results of the model effectiveness test are known that the waste utilization model for physical fitness there is an increase, the pretest obtained an average figure of 33.57 and posttest obtained an average figure of 36.63. From the data can be concluded there is an increase after treatment. The results of the effectiveness test showed the results of t -count = 7818, df = 62 and p -value = $0.00 < 0.05$, meaning that the physical fitness exercise model for elementary school students before and after treatment there was a significant difference. It can be concluded that the waste utilization model for physical fitness of elementary school students, effective and able to improve physical fitness.

Keywords: Physical Education, Cardiorespiratory, Elementary School

Introduction

According to a survey conducted by the Ministry of Youth and Sports Republic in 2014 The percentage of 5-19 year old who do sports through school lines is 56.06 percent. With such a high number is certainly a capital to make the school as a means in an effort to cultivate sports. If the culture of sports is already embedded in school-age children, of course this will have a positive impact on their lives in the future. When we look at developed countries like United States of America, they position Physical Education as a program for living provision "Physical Education programs are to develop physically literate individuals who possess the knowledge, skills, and self-confidence to participate in activity for a lifetime" (Hodges, 2014).

Sports in schools are packaged in a learning activity guided by the curriculum in Indonesia. As the opinion (Siegrist, 2013) "The environment at school has great potential to introduce and encourage a healthy lifestyle in children across all socioeconomical and ethnic borders". Through sports in schools or so-called physical education is expected in addition to fostering the spirit of exercise so as to increase the awareness figures for exercise so that it becomes a healthy lifestyle further physical education is expected to be the foundation so that the young generation of Indonesia has a strong character and has a healthy soul, to realize it needs roles from various parties.

Based on observations made by researchers from five elementary schools in Blanakan sub-district, 95% of physical education teachers in providing learning to students are still fixated on techniques from sports. As in the large ball game material in grade 5, physical education teachers teach service techniques on bolavoli on the material, this is certainly not in line with the characteristics of elementary school students.

Further observations were made to students during the learning process, from the observations researchers saw boring learning for students, it is due to several factors including the lack of variety of learning that teachers provide and learning media that is not interesting for students.

Based on these observations, there are shortcomings of physical education teachers in terms of modifying the model and learning media. This makes physical education learning in elementary school boring, unmotivated students, tends to teach techniques from sports, and does not achieve the objectives of physical education learning in elementary school. Furthermore, down on the problem needs to be efforts to create a model of physical education learning that there is an element of play, saving and safe. Researchers will use household waste to create an interesting and safe learning medium for elementary school students. The choice of household waste as a material in making learning media because in addition to cost-effective it will also have an impact in decomposing household waste, so that waste that used to be considered to have no benefits, can now be recycled into a medium of physical education learning. So there is no more reason not to provide physical education learning that is in accordance with the characteristics of elementary school students due to the lack of facilities and infrastructure.

Based on these needs, researchers want to conduct research to provide solutions to the lack of models and learning media in physical education by developing cardiorespiratory exercise models based on waste media utilization for elementary school students.

Physical Education is an integral part of education conducted through physical activities to shape people from cognitive, affective and psychomotor aspects. Physical education is an activity presented as a curricular part that is used as a medium for the educational process, which aims to develop cognitive domains, affective domains and psychomotor domains. This is in line with the opinion (Mosston, 2003) which argues that "Physical education is more than the skills, rules of the games, or the freedom to discover movement". Physical education should be able to develop about attitudes and understanding of the values contained in physical education for the future of students, so that physical education is considered a fun and directed lesson (Burban, Chenzoy, 2009).

Cardiorespiratory endurance is an important component of physical fitness, cardiorespiratory is strongly related to the quality of one's health. A person who has good cardiorespiratory endurance will have an effect on improving quality of life, research on cardiorespiratory has been widely conducted in various countries from an educational perspective, in a context related to health or in sports has become the goal of many researchers. Cardiorespiratory is very related to lung and heart performance, if the cardiorespiratory endurance is low the work of the heart will be heavier it is due to having to maintain physical activity that is being done.

According to (Butler,et.al., 2008) Cardiorespiratory exercises such as walking, running, cycling, swimming, or climbing stairs, two to four times per week with exercise intensity being at a moderate rate of 60-75% of the maximum heart rate or at the heart reserve by 70% can increase cardiorespiratory endurance. Thus, a person if they want to have good

cardiorespiratory endurance should do physical activity at least four times a week with moderate intensity. It has been consistently associated with a lower risk of many health outcomes, such as cardiovascular disease. (Ekelund, U., Anderssen, S. A., & Froberg, K, 2007)

Cardiorespiratory related to physical fitness or in English called physical fitness is an important component in performing daily activities. As O'Malleyet.al., 2017, "PF represents the ability of an individual to perform daily activities with no excessive pain or energy expenditure." Most studies show no link between aerobic ability and disease. (Klepper, 2003). Although other studies have shown that there is a significant link between aerobic ability to joint health in children.

A person's physical fitness level can be seen in daily activities, if easily tired means that the level of physical fitness is low, it is caused by excessive energy expenditure due to ineffective and efficient work of the body's organs. If one's organs can work effectively and efficiently, automatic activity will feel light and not easily tired. A person's dynamic healthy degree is a basic physical ability to perform tasks.

Methods

The research was conducted in two elementary schools in Blanakan Subang Subdistrict, the subjects of the research were grade 5 students in two elementary schools. Research and development of physical education learning media for physical fitness. Located in elementary school in Blanakan Subdistrict, Subang Regency, West Java Province. Research development of physical education learning media using research and development model from Borg & Gall. The approach used in this study is a quarry and quantitative approach.

Results

After the results of product development model waste utilization model for physical fitness elementary school students were tested by experts and revised obtained 21 items to be used in the next phase of trials. The efficiency of the design of the exercise model developed in the research was obtained from the test results. The way to find out the effectiveness of the waste utilization model model for physical fitness of elementary school students is conducted three trials in elementary school students, namely: 1) small group trials, 2) large group trials, 3) trials by giving treatment of waste utilization models for physical fitness of elementary school students and see the results of the process.

Small group trial results

The small group test stage using 20 subjects at SDN Blanakan, the data was obtained from the survey results in the form of questions to the subjects. There are 21 questions about the ease of model item penetration and 21 questions about the subject's interest in using this waste utilization model. Small group trial activities were conducted once, Here researchers presented the results of data analysis conducted based on survey data on the ease and interest of subjects in applying 21 model items:

Table 1. Small Group Trial Data Analysis Results

	valuation	Score Acquisition	Maximum Score	%	information
1	Ease	300	420	71	good
2	Attractiveness	354	420	83	good

From the results of a small group test tested on 20 elementary school students, showed that 71% of students found it easy to apply model items. From the data, it can be known that the 21 model items are in accordance with the characteristics of elementary school students, meaning that they have no difficulty in performing physical activities with media made of waste.

The results of the analysis of the attractiveness of 83% of students are quite interested in the media made, it certainly adds to the spirit of students in doing physical activities, so it will have an impact on physical fitness. With the interest learning media will have a positive impact on the learning process.

From the results of the researchers' analysis at the small group test stage can be concluded 25 items of waste utilization model for physical fitness of elementary school students can be used for large group trials.

Large group trial results.

Large group tests are conducted to obtain emperis data on the products created. At this stage, researchers conducted research on students in two schools, namely Tanjungsari State Elementary School which numbered 38 people and Blanakan State Elementary School with 30 people total subjects used in this large group test as many as 68 people. The results of large group tests are presented in the following table.

Table 2. Large Group Trial Data Analysis Results

	valuation	Score Acquisition	Maximum Score	%	information
1	Ease	1239	1428	86	good
2	Attractiveness	1197	1428	83	enough

From the results of large group tests showed 59 people or 86% stated easy to use media from waste. This indicates that the media and models developed can be used. From the aspect of attractiveness assessment in the large group test group obtained 57 people or 83 % liked the media and models used.

Furthermore, researchers carry out effectiveness tests, the data used is a type of quantitative data. The effectiveness test in this study was conducted to obtain data on the effectiveness of the application of models developed towards the achievement of research objectives. The effectiveness of the model in this study uses a pre-experimental research design in the form of "Two group pretest-posttest design"

From the results of the calculation can be known that the model of waste utilization for physical fitness experienced an increase, pretest obtained an average figure of 33.57 and at the time of posttest obtained an average figure of 36.63.

Table 3. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	POSTTEST &PRETEST	63	.968	.000

From the results of the correlation coefficient can be known that before and after the treatment of waste utilization model for physical fitness is 0.968 with p-value $0.00 < 0.05$, it can be stated that there is a significant change between pre test and post test.

Table 4. Paired Samples Test

	Paired Differences		95% Confidence Interval			Sig. (2-tailed)
	Mean	Std.Deviation	Td. Error of the Difference			
			Mean	Lower	Upper	
Pwa POSTTEST- ter PRETEST 1	063	3.110	392	2.280	3.847	.882 000

From the calculation of difference significance test using SPSS 23 obtained t-count results = 7,818, $df = 62$ and p-value = $0.00 < 0.05$, meaning that the physical fitness exercise model for elementary school students before and after treatment there is a significant difference.

It can be concluded that the waste utilization model for physical fitness of elementary school students, effective and able to improve physical fitness.

For more details and ease Here's a diagram showing an average comparison of physical fitness tests before and after treatment.

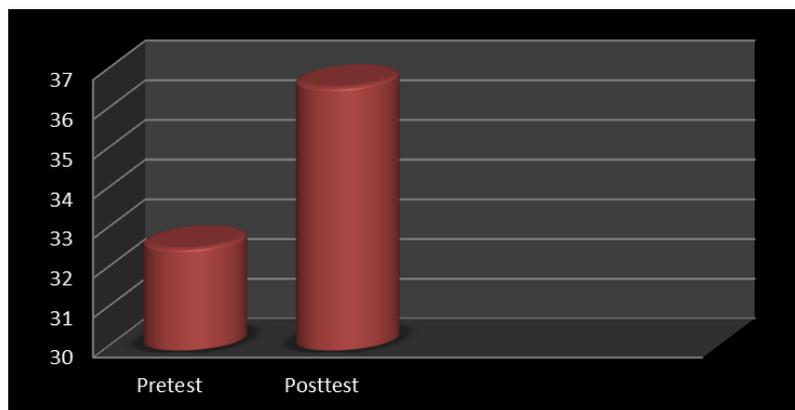


Figure 1. Physical Fitness *Pretest* and *Posttest* Results

Discussion

The final result of the waste utilization model product for physical fitness of elementary school students after research is in the form of a model book of waste utilization for physical fitness for elementary school students is considered to provide guidance for the learning process in elementary school, especially about games for physical fitness school basic. From the results of the analysis of needs in three elementary schools in Kecamatan Blanakan found there is no desire of physical education teachers to modify the media and learning in an effort to improve the quality of learning.

The creation of this model is to improve the physical fitness of elementary school students who are packed through fun games and the use of interesting media. The use of learning media using waste is seen as more economical and practical, this is certainly the

answer to the lack of learning media in elementary schools. In addition, the product that researchers developed is focus on student fitness, because physical fitness is considered as a capital in order to do daily activities well.

To answer the problem formulation in this study, the research conducted a research stage developed according to barg and gall. From the expert test results there are five model items that are not feasible to use, the next model items that experts think are worthy of researchers use in small group tests and large group tests obtained the following data. The data from small group trials showed cumulatively the development of waste utilization models for physical fitness of elementary school students found it easy to practice during learning with a percentage of 60% and made the subject interesting with the learning media made by 75 %.

The results of the small group test showed sufficient criteria and worth using in the learning process, however, there needs to be improvements for product improvement in order to get a better response at the time of large group tests. From the results of large group trials showed cumulative development of waste utilization model for physical fitness in terms of ease of response 82% and subject interest in the model by 72%. The response showed good criteria, there was an increase from small group tests. From these results can be concluded the model is worth using.

Furthermore, the results of the effectiveness test, showed that the model of waste utilization for physical fitness of elementary school students is effective to apply. Thus, it is hoped that this product can be a guideline for teachers in providing physical fitness materials to elementary school students. The advantages of this product are:

- a. The game guide uses waste media that is presented systematically and easily understandable.
- b. The media used is attractive, economical, easy to obtain and tends not to be easily damaged.
- c. The games applied vary so it is not easy to get bored.
- d. Packed according to the characteristics of elementary school students.

Conclusions

Based on the data of the research results consisting of three stages, namely the expert validation stage, small group test and large group test and discussion of the results of the study, researchers can conclude that the learning model created falls into an effective and feasible category for application in the learning process. 1). The results of expert tests in the field of physical education stated that there are 23 model items that are eligible for use, 7 model items are not worth using. Therefore, it is used in small group tests and large group tests of 23 items. 2). The results of the small group trials there are several improvements to be more effective in the implementation of large group tests. 3). Based on the results of the effectiveness test of waste utilization model for physical fitness obtained an average result of 12,052 pretest physical fitness students of 33.57 with a standard deviation of 12,052 and posttest results of physical fitness of students of 36.63 with a standard of 87 deviations of 12,338. This can be interpreted as a model of waste utilization for the physical fitness of primary school students is declared effective.

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