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The effect of differentiated traditional game learning on physical fitness of elementary school students

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ABSTRACT

This study aims to examine the improvement of physical fitness through traditional game learning with differentiation. The design used in this research is quasi experiment. The population in this study were 4th and 5th grade students. The subjects of this study amounted to 20 students. Data collection using the TKJI test for ages 8-10 years. Data analysis techniques using t-test analysis, through prerequisite tests of normality and homogeneity. The results of hypothesis testing using paired samples T-test. The results of paired samples t-test statistical analysis in the control group of traditional game learning with differentiation have a sig value of 0.1111> 0.05, meaning that in the control group of traditional game learning with differentiation there is no significant difference between the initial variable and the final variable. Meanwhile, the experimental group of traditional game learning with differentiation has a sig value of 0.001 < 0.05 so that it can be interpreted that there is a significant difference between the initial variable and the final variable. It was concluded that learning traditional games with differentiation in the control group did not increase, while learning traditional games with differentiation in the experimental group experienced a significant increase, the increase from the initial 12.7 increased to 14.4 with an increase of 1.7.

***Keywords**: differentiated traditional games, physical fitness.*

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INTRODUCTION

Education plays an important role in the development of every individual. Quality education will create a society that is advanced, peaceful, and leads to constructive traits (Bafadal, Hidasari, & Triansyah, 2021). This is certainly the focus of the government, which gave birth to various concepts of curriculum changes made to adapt to current conditions. One of them is the emergence of a new paradigm curriculum (Andika, Wardiah, & Daryono, 2020). Learning independence is the ability of students to take responsibility for their own learning process. The new lea ng paradigm provides flexibility for educators to design learning and assessment designs according to students' characteristics and needs (Sebtika, Winarno, & Sugiyanto, 2017). The new learning paradigm ensures that learning practices are learner-

centered. Learning is a cycle that begins with mapping competency standards, planning the learning process, and implementing assessments to improve learning so that students can achieve the expected competencies (Bayu, Synthiawati, & Setyawan, 2014).

Physical education is a learning process through physical activity that aims to improve overall body fitness, develop thinking skills, knowledge, healthy and positive life behaviors, sportsmanship, and emotional intelligence (Deviana Pramuka, Hartono, & Baskoro Aji Putra, 2013). Physical education is related to physical activities that aim to train one's body fitness (Rozi, 2021). In the world of education, everyone has the right to get a proper education as stated in Law No. 39 of 1999 concerning Human Rights Article 12 which states that everyone has the right to protection for their personal development, obtain education, educate themselves, and improve their quality of life in order to become a human being who is faithful, pious, responsible, noble, happy, and prosperous (Hidayat, Puji Purwono, & Qoriah, 2015). Everyone means all the nation's children without exception, including those who have special needs or experience challenges in their physical development, are also entitled to education, including physical education (Wibowo & Yuwono, 2022).

Differentiated learning is a way to recognize and teach students' diverse talents and learning styles (Naibaho, 2023). Differentiation occurs when the curriculum modification process refers to the students' preferred way of learning, rather than based on teacher judgment (Armanjaya et al., 2023). The distinct pattern of verbal learning impairment across risk profiles suggests that verbal learning may index susceptibility to disease more sensitively than general cognitive impairment during childhood, and differentiate the risk of symptom continuation among children who exhibit antecedents as well as general cognitive impairment (IQ) (Cahyono, 2023).

Differentiated learning is not new to education. Differentiated learning is also known as differential learning. According to Chairunnisa, Maulana, & Agyl, (2024) Differential learning is a motor learning model based on the importance of movement variability and rooted in the dynamic systems theory of human movement. By varying learning methods and providing opportunities for students to access information through various means, physical education teachers can improve students' learning outcomes (Chairunnisa et al., 2024). In addition, providing support for different learning styles can help learners feel more engaged and successful in learning physical education teachers through Differentiated Learning. Physical Education teachers must understand students' different learning styles when planning and implementing lessons. By making initial observations of individual learning styles, teachers

can build a foundation for better learning strategies. A variety of learning approaches and opportunities to access information through various channels will increase student participation. By incorporating kinesthetic, visual and auditory elements in every learning session, teachers can meet the needs of different learning styles with differentiated learning should be the main focus (Marlina, 2019).

Supported by research Rahman, Indahwati, & Widiyanti, (2023) stated that the application of differentiated learning in PE learning in elementary schools is considered very effective, this is indicated by an increase in movement activity in each indicator that has been tested so that it can improve student fitness, differentiated learning is also considered more interesting than other learning because in the differentiated learning process the process is presented with a lot of learning media that suits the learning style needs of each student, so that students are more interested in participating in the learning process which in turn can improve students' physical fitness. Traditional games in elementary schools are games that are currently being popularly implemented by some physical education teachers in elementary schools (Rachman, Armanjaya, Ramadhan, Gumantan, & Alrianti, 2024), Various traditional games that are widely played in elementary schools include cricket, gobak sodor, clogs, bentengan, and egrang batok. Traditional games in elementary school can increase the level of cooperation and fitness among students in school (Ardiansyah & Djawa, 2019). Based on research of various traditional games commonly played in schools, the researcher chose gobak sodor and bentengan as the main tools in this study. This is because Gobak Sodor involves intense physical activity, such as running, dodging, and changing direction quickly. This is very effective for improving cardiovascular endurance, speed, and agility for elementary school students in accordance with research Bogy Restu Ilahi (2023) Traditional hadang games have an influence on increasing the physical fitness of class IV and V students by 12.78%. In addition, bentengan games also involve dynamic physical activities, such as running, chasing, and dodging. This game is effective for increasing speed, agility, and endurance for elementary school students in accordance with research Carolin & Devita, (2024) that there is an influence of traditional bentengan sports on the physical fitness of fourth grade students of Public elementary school Craken 1, Munjungan District, Trenggalek Regency with a significance level of 5%.

Based on the background of the problem, this study aims to determine the effect of traditional game learning with a differentiation approach on improving students' physical fitness at Public Elementary School No 1 Tambah Rejo. Student learning activities have an important role in supporting students' physical fitness, so they need to be monitored,

maintained, and improved if they are not optimal. Based on initial observations, the level of physical fitness of students in grades IV and V at Public Elementary School No 1 Tambah Rejo is still relatively low. Therefore, through this research, it is hoped that there will be an increase in students' physical fitness, and encourage students to be more active in doing physical activities, especially when participating in physical education learning through traditional games. This research carries the title "The Effect of Differentiated Traditional Game Learning on Physical Fitness of Elementary School Students".

METHODS

This type of research is a quasi experiment. The design in this study was a two group pre test and post test design, namely by comparing between the control group and the experimental group. The experimental group was given treatment in the form of differentiated traditional games, while the control group was only given games without differentiation. In the experimental group or treatment given traditional game learning differentiation of gobak sodor and bentengan with initial activities carried out giving treatment (pretest) to a subject and ending with a test that serves to determine the effect of the application of traditional game learning on improving physical fitness in students of Public Elementary School No 1 Tambah Rejo. The population in this study were students in grades IV and V of State Elementary School 1 Tambah Rejo.

In this study, the sampling method used was clearly defined to avoid ambiguity. To determine the sample, the researchers used random sampling to select participants. The total population consisted of 50 subjects. A total of 20 subjects were selected and divided into two groups: an experimental group of 10 subjects and a control group of 10 subjects. Within each group, participants were randomly assigned using random sampling techniques to ensure fairness and reduce bias during the allocation process. The test instruments conducted for the initial measurement and final measurement used the Indonesian Physical Fitness Test (TKJI) for 8-10 year old boys (Permana, 2016). The data analysis technique in this study used paired sample T Test analysis which aims to compare pretest and posttest groups before and after being given treatment in the form of differentiated traditional games. According to (Sugiyono, 2019) explains that there are requirements before conducting a paired sample T test, including normally distributed data, homogeneous data. The collected data will be processed using the help of IBM SPSS 25 software in the form of a data normality test with the Lilliefors test statistic with the formula, while the homogeneity test of this research data consists of two data groups, namely the experimental group and the control group, therefore the homogeneity test

uses the F test. After F count is found, the next step is to compare F count with F table. If F count> F table, then the data is homogeneous, but on the contrary if F count < F table then the collected research data is not homogeneous. Hypothesis testing in this study used the paired sample T-test method to compare the mean between two different samples.

RESULTS AND DISCUSSION

The data in this study were obtained from the results of tests and measurements conducted on 4th and 5th grade students of Public Elementary School No 1 1 Tambah Rejo. The tests and measurements in question are the Indonesian physical fitness test (TKJI) for boys aged 8-10 years, while this test is to measure the physical fitness ability of children aged 8-10 years. This study was conducted to determine the effect of learning different traditional games on physical fitness. The subjects in this study were 4th and 5th grade students of State Elementary School 1 Tambah Rejo with a total sample size of 20 people. The data obtained was then analyzed using SPSS version 25 software.

Table 1. Statistical description of the physical fitness level of the experimental group

Statistik	Pretest	Posttest
Mean	12.7	14.4
Median	13.0	14.5
SD	.949	1.075
Min	11	12
Max	14	16

From the data above, it can be described that the level of physical fitness in 4th and 5th grade students of Public Elementary School No 1 Tambah Rejo in the experimental group when taking pretest data is an average of 12.7, median value of 13.0, standard deviation of 0.949, lowest score of 11 and highest score of 14. The posttest data of the experimental group is an average of 14.4, median value of 14.5, standard deviation of 1.075, lowest score of 12 and highest score of 16.

Table 2. Statistical description of the physical fitness level of the control group

Statistik	Pretest	Posttest
Mean	12.7	13.3
Median	13.0	13.0
SD	.949	1.059
Min	11	11
Max	14	15

From the data above, it can be described that the level of physical fitness in 4th and 5th grade students of Public Elementary School No 1 Tambah Rejo, the average control group pretest data is 12.7, the mean value is 13.0, the standard deviation is 0.949, the lowest score is 11 and the highest score is 14, control group posttest data averaged 13.4, mean value of 13.0, standard deviation of 1.059, lowest score of 11 and highest score of 15, control group posttest data averaged 13.4, mean value of 13.0, standard deviation of 1.059, lowest score of 11 and highest score of 15. The normality test will test the hypothesis that the sample comes from a normally distributed population.

Table 3. Normality test

Variabel	Sig	Conclusion
Pretest	0.16	Normal
Posttest Experimen	0.28	Normal
Posttest Control	0.09	Normal

From the table above, the sig values of these variables are all greater than 0.05, so the hypothesis stating that the sample comes from a normally distributed population is accepted. From this information, the variable data in this study can be analyzed using parametric statistics. The homogeneity test aims to prove whether the variances of the variables are the same (homogeneous). If the significance value is 0.05 then the variable is homogeneous, and if the significance value is 0.05 then the variable is not homogeneous. The results of the homogeneity test calculation are presented in the following table.

Table 4. Homogeneity test

Variable	Sig	Conclusion
Traditional game practice Control Group	0.068	Homogen
Traditional game practice Experimental Group	0.208	Homogen

From the calculation results obtained Sig value. > 0.05, meaning that the sample variance is said to be homogeneous, then the hypothesis stating the variance of the existing variables is accepted. Thus it can be concluded that the variance of the research subjects is homogeneous. Hypothesis testing was carried out using paired sample t-test statistical analysis. Data analysis was carried out to answer the hypothesis proposed, namely that there is an effect of differentiated traditional game learning on physical fitness in students of Public Elementary School No 1 Tambah Rejo. To see whether or not there is an effect of the application of differentiated traditional game learning on physical fitness in students of State Elementary

School 1 Tambah Rejo. Then hypothesis testing is carried out using paired sample t-tests which can be seen in the following table:

Table 5. Homogeneity test

Variable	Pretest	Posttest	Sig.	Conclusion
Differentiated Traditional Games Experimental Group	12.7	14.4	0.001	Significant
Differentiated Traditional Games Control Group	12.7	13.3	0.111	Not Significant

Based on the table above, the results of the paired samples t test statistical analysis of the control group have a sig value of 0.1111> 0.05, meaning that the traditional game control group does not have a significant difference between the initial and final variables. While the experimental group of differentiated traditional games has a sig value of 0.001 < 0.05 so that it can be interpreted that there is a significant difference between the initial variable and the final variable. From the results of these statistical calculations it can be concluded that the traditional game of the control group did not increase, while the traditional game of the differentiated experimental group experienced a significant increase, the initial increase of 12.7 increased to 14.4 the amount of increase was 1.7.

DISCUSSION

This research offers an innovative solution by integrating traditional games as an effective method to improve students' physical fitness. This approach is not only easy to implement and inexpensive, but also culturally appropriate, making it a relevant alternative to conventional physical activities in elementary schools. Differentiated learning, which is the basis of this research, is unique in that it is student-centered, with educators acting as facilitators who direct the learning process. This concept respects the different abilities of each student, making it very suitable to be implemented in primary schools, where students have a diversity of potential and learning needs (Naibaho, 2023). Differentiated learning gives students the freedom to play while learning, where games are not only recreational but also meaningful, involve the five senses, and develop the various potentials of students.

The results showed a significant increase in physical fitness of 4th and 5th grade students of Public Elementary School No 1 Tambah Rejo after being given learning through varied traditional games. The t-test analysis in the experimental group showed a sig value of 0.001 < 0.05, indicating a significant difference between the pretest and posttest. In contrast, in the

control group that was not given special treatment, the sig value of 0.111 > 0.05 indicated no significant difference. This finding is in line with research (Fajar & Hamdani, 2019) which states that physical exercise through traditional games can improve students' physical fitness. They emphasized that game-based physical activity is not only fun but also effective in improving students' endurance, strength, and flexibility. The concept of differentiated learning applied in this study is also supported by the theory of Tomlinson, (2014) which states that learning that respects individual differences can increase student motivation and participation. This can be seen from the improvement of physical fitness in the experimental group, where students are given the freedom to engage in traditional games that are tailored to their abilities and interests. In addition, research Ramadhani, Mahardika, & Indahwati, (2021) also supported the use of traditional games as an effective method to improve the physical fitness of elementary school students. They found that traditional games not only stimulate physical activity but also engage students emotionally and socially.

Comparison with similar research, such as that conducted by Anggono & Nurhidayat, (2024), shows similar results where traditional game-based learning models are able to increase students' active participation in physical activity. They stated that students tend to be more motivated when learning is done through fun and contextual approaches, such as traditional games. This is in line with the findings of this study, where students in the experimental group showed a significant increase in physical fitness after being given treatment in the form of varied traditional games.

Empirical evidence of this research can be seen from the results of the t-test which shows a significant difference between the pretest and posttest in the experimental group (sig 0.001 <0.05). This indicates that differentiated traditional game learning is effective in improving students' physical fitness. In contrast, in the control group that was not given special treatment, no significant difference was found (sig 0.111 > 0.05). This indicates that the conventional approach without variations of traditional games is less effective in improving students' physical fitness.

Although the results of this study show a positive impact, there are some limitations that need to be recognized. This study only focused on physical fitness as the dependent variable, without considering other factors such as nutritional intake, sleep quality, or exercise habits outside of school. Future research could include these variables to provide a more comprehensive analysis. In addition, future studies could expand the sample and duration of the intervention to test the consistency of the results.

CONCLUSION

The conclusion of this study is that there is an increase in physical fitness through learning traditional games with differentiation in students of State Elementary School 1 Tambah Rejo. Learning with a play approach is proven to be able to improve students' physical fitness. This shows that the play approach is one of the effective strategies in improving physical fitness, especially for elementary school students. Physical education teachers can integrate traditional games in learning as the main or additional method to improve students' physical fitness. A differentiation approach needs to be applied to adjust the level of difficulty of the game to the abilities and needs of students so that maximum participation can be achieved. Schools and education policy makers can incorporate traditional games into the physical education curriculum as a fun and effective physical activity-based learning strategy. In addition, training for teachers on play-based approaches, including differentiation techniques, should be provided to accommodate students' diverse abilities. Support in providing facilities, such as safe play areas and appropriate learning aids, is also important to ensure optimal implementation of traditional games. Teachers need to systematically develop game-based learning models by considering game variations to improve various aspects of physical fitness, such as endurance, strength, agility and balance. In addition, schools can collaborate with local communities or related institutions to preserve and develop traditional games as part of active and fun learning for students.

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