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The Effect of Differentiated Learning Through Gross Motor Skills on Physical Fitness in Physical Education Learning

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Abstract

This research aims to determine the effect of differentiated learning through gross motor skills on physical fitness in physical education learning. The method used is quasi-experimental. The population of this research is class IV students at SDN 254 Griya Bumi Antapani Bandung for the 2023/2024 academic year, totaling 54 people. The sample used was 26 people. The instrument used is TKSI Phase B with 5 test items, that's: V Sit and Reach Test, Half Up Test, Hand Eye coordination Test, T Test, and Around the World Test. The data analysis techniques used are Paired Sample T-Test, and Linear Regression using the SPSS For Windows 20 application, at the Sig T Test level. (0.000) < 0.05. Based on the results of data analysis, this research shows that there is an influence of differentiated learning through gross motor skills on physical fitness in physical education learning. Also supported by the results of data analysis carried out using the R Square test, the results showed that the magnitude of the effect between the pre-test and post-test experimental data was 0.111% x 100%. In this way, the increase in the influence of learning with differentiated programs through gross motor skills on physical fitness in physical education is 11.1%. So with the results of data analysis, it can be concluded that there is an influence of differentiated learning through gross motor skills on physical fitness in physical education learning, and differentiated learning has an effect on improving gross motor skills on the physical fitness of class IV students at SDN 254 Griya Bumi Antapani Bandung.

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INTRODUCTION

Physical education is an educational process which can develop physical growth, which includes psychomotor, affective and cognitive aspects. In addition, education involves physical activity to produce the development of individual qualities, both physical, mental and emotional. Physical education is learning by learning to move, and learning by undergoing movement. To be able to achieve teaching in the form of movement that is embodied in physical education, students are expected to have experience of movement to be able to shape them physically and mentally (Mulyanto & Safari 2016, hlm. 29). Physical education is a form of educational process carried out individually or in groups with treatment carried out consciously and well organized through all kinds of a form of activity related to physical activity. This is done to produce physical growth, health and physical fitness, skills and abilities, development of personality and information, as well as the development of intelligence Anwar (Wicaksono & Kusuma, 2020, hlm. 42-43). Education must be provided at a school level. Therefore, physical education has a very easy role in forming a complete human being (Aguss 2020, hlm. 44).

In physical education learning in elementary schools, what physical education teachers need to implement and pay attention to is providing meaningful learning for students. Apart from that, the method used must be in accordance with the student's wishes, or in other cases, students are given the freedom to explore the learning they will do. This is in line with the development of the established curriculum, namely the Merdeka Curriculum, which is interpreted as a learning design that provides students with the opportunity to learn calmly, relaxed, fun, stress-free and pressure-free, to show their natural talents. This will support whether or not the student's fitness is good in the movement tasks they are carrying out. Merdeka Belajar focuses on freedom and creative thinking. For the success of all this, the role of a teacher is needed. Which is in line with the opinion of Sunario Tanggur, (2023) "Teachers as the main subject whose role is expected to be able to act as a driving force to take action that provides positive things to students." With the Merdeka curriculum, it is a restructuring of the national education system in Indonesia.

The National Education Standards Agency believes that the Independent Learning Curriculum is a learning curriculum with a talent and interest approach as a reference. In the independent curriculum, to maximize the process of learning activities, teachers are required to be able to make learning activities not monotonous and just explain things. However, an educator must be able to pay attention to any provisions that influence the learning process to feel monotonous. The teacher's efforts to achieve a goal in learning require energy, hard work, creativity and the teacher plays an active and innovative role. With the demands of the Merdeka curriculum, teachers must be able to package learning for students according to their interests and talents.

The problem in physical education learning is that there is still a lack of teacher innovation in developing active and effective learning situations. With the facts in the field, during the learning process regarding the combination of locomotor, non-locomotor and manipulative movements, problems arise that are experienced by students, such as if there is material that is considered difficult by students, they are often silent and do not want to participate in learning. . In this way, many students are reluctant to learn if they are given media that is difficult to use. Apart from that, when a movement is given

that is difficult to complete or pass, students refuse to do the movement during the learning process. And the main problem is that many students complain about motor skills that they should normally do.

This is due to a lack of movement skills in daily activities. This is in line with what was stated by Setyawan & Hendrawan, (2023, p. 108) movement skills are important for a child's motor skills, because this will be a determinant in carrying out children's activities, so they require movement activities that can support their abilities. children's motor movements. This will affect the physical fitness of the students themselves. Providing appropriate and optimal stimulus is very necessary to carry out aspects of development in students. Gross motor skills are one of the most important skills to develop in PJOK learning (Andhika, Prayoga, & Darumoyo, 2022, p. 59).

In line with what was stated by Lloyd, Saunders, Bremer, & Tremblay, (2014) "Recent research has demonstrated positive cross-sectional relationships between fundamental movement skills and physical activity in children. As the evidence documenting the importance of fundamental motor skills". Reinforced by Dapp, Gashaj, & Roebers, (2021) It was explained that physical activity can encourage the development of motor skills in the long term, and because many children enjoy active physical activity, children are able to optimize their activities according to their abilities. "children with movement difficulties often do not grow out of these motor problems" (Cousins & Smyth, 2003).

With the gap between the field and theory, this becomes a reference that it is very important to develop students' motor skills. So the task of educators must be to be able to package learning as optimally as possible, so that motor skills can still be carried out optimally, packaged in the form of meaningful learning. "Since each student is unique, it might be necessary to employ a different teaching method for student. Physical education is one of the lessons in which individual differences stand out because each student has a different capacity to perceive and perform a move shown in this physical education."(Özbal, Sağlam, & Cavkaytar, 2019).

With several references, differentiated learning is an active method for development in a learning process, especially in physical education. This is supported by Mirzabdullayevich, (2024) who states that "A differentiated approach in education is a key element of effective learning, including in the field of physical education. A differentiated approach to the formation of students' motor activity not only takes into account the individual characteristics of each student, but also contributes to the maximum disclosure of their physical potential" the importance of efforts to increase and maintain physical fitness as an integral part of efforts to improve the quality of life of Indonesian people, can be done through education and acculturation processes for all Indonesian people. This is in line with research data that the fitness level of elementary school students in West Java is not all in good condition. There were still 42.27% of elementary school students with low levels of physical fitness. Male students have better physical fitness compared to female students. In elementary school, the higher the class, the higher the level of physical fitness (Sulistiono, 2014)

This is in line with (Ibnu, (2017) that the level of physical fitness in schools is still not good, this is due to the lack of movement activities of students, so they easily experience fatigue when doing sports activities and become overweight, or obese which makes them physical

weakness and lack of strength to be able to carry out quite heavy physical tasks. So, efforts to provide optimal movement activities for student involvement, especially physical education learning, will contribute to improving physical abilities which are very useful when carrying out daily activities (Kerr et al., 2018).

With this data, improving physical fitness through the educational process must be done by providing alternative learning processes that can support physical fitness. In this way, this is considered important to do because the aim of physical education learning is towards movement and learning. So, with this problem, practical and innovative learning will make it easier for students to remain active in learning activities, one of which is by implementing differentiated learning, it will make it easier for students to grow and develop in their daily lives both at school and outside school. to maintain physical fitness.

METHODS

The method used is experimentation. “Experimental research is unique in very important respects. It is the only type of research that directly attempts to influence a particular variable, and when properly applied, it is the best type for testing hypotheses about cause-and-effect relationships (Fraenkel, Wallen, & Hyun, 2012). The research design used in this study was a quasi-experiment using two groups in a school. In the research, a certain treatment was given to the experimental group, namely by applying differentiated learning in PJOK learning, and the control group by applying regular/conventional PJOK learning in accordance with the learning program. This is to see whether there is an influence or not on the students' physical fitness.

The instrument used is TKSI Phase B with 5 test items, namely: V Sit and Reach Test, Half Up Test, Hand Eye coordination Test, T Test, and Around the World Test.

1. V Sit and Reach Test. This is a test carried out by pushing both hands forward from a straight sitting position. This test is a modification of the V-Sit and Reach Presidential Physical Fitness Test. The aim is to measure the flexibility of the lower back and rear thigh muscles.
2. Half Up Test. This is a test that is done by bending the stomach from a supine position, following a rhythm every 3 seconds. This test is a modification of the Half Sit-Up Test. The aim is to measure the endurance of the abdominal muscles.
3. Hand Eye Coordination Test. This is a test carried out by throwing a ball towards a wall using one hand and catching the ball again using the same hand. The aim is to measure hand-eye coordination.
4. T Test. This is a test carried out by running forward, galloping or galloping to the side, and running backwards (Multidirectional). This test is an adoption of Brian McKenzie's T'Drill Test. The goal is to measure agility.
5. Around the World Test. This is a test carried out by running and moving a ball from one chair to another. The distance between chairs is 15 meters. This test is a modification of the Hoosier Endurance Shuttle Run AU Physical Fitness Program. The aim is to measure cardiovascular endurance.

Participants

The population is a large group that is considered interesting by researchers, who are expected to be able to realize the results in a study (Fraenkel et

al., 2012). The population in this study were upper elementary school students, located at SDN 254 Griya Bumi Antapani, Bandung City. The population used was all class IV students, totaling 54 people.

Sampling Procedures

A sample is a process of selecting from a predetermined population, so that an individual can represent the larger group from which they were selected (Fraenkel et al., 2012). The sample is part of the data from the population that will be studied. So the sample used was only a portion of class IV students, namely 26 people. Researchers used sampling with a purposive sampling model, which according to Sugiyono, (2016) is a sample determination technique by looking at several considerations. The sample criteria used were looking at good enthusiasm in each class, students' activeness during learning, good gross motor skills, and students who were always present in the learning process. To divide the samples into research groups, the researcher gave sequential numbers from 1 to 26. Odd serial numbers 1, 3, 5 to 25 were the control class of 13 people, while even serial numbers from 2, 4, 6 to 26 were the control class. experiment with 13 people. The total sample of the control and experimental groups was 26 students. According to Abdullah, (2015) taking a purposive sampling technique is quite good, because it is in accordance with the researcher's considerations, so that the data collected can meet the minimum quantity requirements.

Materials and Apparatus

Instruments are very important in research, therefore instruments are a tool for finding out data that will be the result of ongoing research. The instrument in this research is to use a test. Where the test provides a treatment or treatment regarding the effect of differentiated learning on physical fitness. The test is a series of exercises or it could also be a question which aims to measure an ability, skill, intelligence possessed by an individual or group (ZAHROH, 2018). According to Suherman, (2019) the instrument functions as a tool in collecting the necessary data. Therefore, a researcher can be an instrument in a study. The instruments to be used in research must be valid and reliable. In this research, data collection is used by carrying out tests, and is supported by documentation of the implementation of a test. The instrument used is TKSI which was launched in the Merdeka curriculum. The measuring tool in this research is to determine the level of physical fitness of students.

Procedures

This research procedure consists of three research procedures, the explanation is as follows (1) Preparation stage, namely asking permission from the Principal of SDN 254 Griya Bumi Antapani, Bandung City to carry out the research, then observing the place where the students we will study are, in order to better understand the characteristics of Class IV Students at SDN 254 Griya Bumi Antapani, Bandung City and the place where the research will be carried out. (2) The Implementation Stage begins by giving an initial test to determine whether the fitness of class IV students is good or not to measure the students' physical fitness before being given treatment using differentiated learning. The next stage is that the experimental group samples are given treatment in the form of differentiated learning, while the control group samples are given conventional learning treatment. Then, in the final stage, both experimental and control groups were given a post-test to measure physical fitness after being given treatment using differentiated learning and conventional learning. The purpose of using

differentiated learning is to find out whether there is an influence of motor skills on physical fitness through differentiated learning in physical education learning. The estimated time for this research is 2 months with a learning frequency of 2 meetings in 1 week, so the total number of meetings is 12 meetings. (3) Data Processing Stage from the initial test to the final test collected, both from the experimental group and from the control group. Then calculations will be carried out using statistical data, with the help of the SPSS 20.0 program to find out the results of the research.

Design or Data Analysis

Data analysis is a method used to accurately summarize data that has been collected. The data that has been obtained from all research results is quantitative and qualitative data in the form of numbers and descriptions of research results. Data obtained from the pre-test and post-test results are then identified and analyzed first. After receiving pre-test and post-test data from the experimental group and control group, the average pre-test and post-test scores were calculated. The results of this value are the average value of increase in physical fitness in the experimental group and the control group. Then an average calculation is carried out which checks the resulting data with a normality test to find out whether the data is normal or not. Next, use the homogeneity test to find out whether the data uses the t test which will be used. The paired sample t-test is used to determine whether two variables are the same or not, assuming the data is normally distributed, and the regression test is used to form a model of the relationship between the dependent variable and the independent variable. In this research, data processing and data analysis techniques were carried out with the help of the SPSS 20.0 for Windows program.

RESULT

Table 1. Statistical Description of the Control Group

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Pre_Test_Kontrol	65	1	5	180	2.77	1.027
Post_Test_Kontrol	65	1	5	198	3.05	1.138
Valid N (listwise)	65					

Based on the results of table 1 above, there are a total of pre-test and post-test scores for the control group obtained from learning results using a curriculum system for physical fitness with criteria 1-5. This can be seen from the results of the pre-test totaling 180, with an average value of 2.77, and a standard deviation of 1.02. Meanwhile, the number of post-test results was 198, with an average value of 3.05 and a standard deviation of 1.13.

Table 2. Statistical Description of the Experimen Group

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Pre_Test_Eksperimen	65	1	5	204	3.14	1.088
Post_Test_Eksperimen	65	1	5	210	3.23	1.101
Valid N (listwise)	65					

Based on the results of table 2 above, there are a number of pre-test and post-test scores for the experimental group obtained from learning results using a differentiated system for physical fitness with criteria 1-5. This can be seen from the results of the pre-test totaling 204, with an average value of 3.14, and a standard deviation of 1.08. Meanwhile, the number of post-test results was 210, with an average value of 3.23 and a standard deviation of 1.10.

Normality Test

Table 3. Data from the Normality Test Results for the Experimental Group and Control Group

One-Sample Kolmogorov-Smirnov Test

		Pre_Test_Eksperimen	Post_Test_Eksperimen	Pre_Test_Kontrol	Post_Test_Kontrol
N		65	65	65	65
Normal Parameters[a,b]	Mean	2.77	3.05	3.23	3.14
	Std. Deviation	1.027	1.138	1.101	1.088
Most Extreme Differences	Absolute	.227	.193	.183	.212
	Positive	.227	.193	.183	.212
	Negative	-.189	-.176	-.171	-.157
Kolmogorov-Smirnov Z		1.826	1.557	1.476	1.711
Asymp. Sig. (2-tailed)		.668	.789	.576	.643

From the results of the normality test in table 3, it shows that the P-value Sig. in the Kolmogorov-Smirnov column for pre-test and post-test data both groups have a P-value Sig. > 0.05 as follows:

1. Experimental pre-test data on physical fitness has a P-value of Sig. 0.668 > 0.05 which means the data is normally distributed.
2. Experimental post-test data on physical fitness has a P-value of Sig. 0.789 > 0.05 which means the data is normally distributed.
3. Pre-test control data on physical fitness has a P-value of Sig. 0.576 > 0.05 which means the data is normally distributed.
4. Post-test control data on physical fitness has a P-value of Sig. 0.643 > 0.05 which means the data is normally distributed.

Homogeneity Test

Table 4. Data from the Homogeneity Test Results of the Experimental Group and Control Group

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.747	19	240	.768

From the homogeneity test results in table 4, it shows that the P-value Sig. (0.768) > 0.05, so it can be concluded that the data obtained is homogeneous.

Paired Sample T-Test

Based on the results of data analysis, it is explained that the Sig. (0.000) < 0.05 means that H1 is accepted, which means that this research shows the influence of differentiated learning through gross motor skills on physical fitness in physical education learning. Based on the results of data processing, this shows that the Sig. Pair 1 and Pair 2 are as follows:

1. Based on the output of Pair 1 Pre Test and Post Test for the Experimental Group, the Sig value was obtained. (2-tailed) is 0.000 < 0.05, so it can be concluded that there is a difference in the average physical education learning outcomes for the experimental class pre-test and the experimental class post-test.
2. Meanwhile, the output of Pair 2 Pre Test and Post Test for the Control Group obtained a Sig value. (2-tailed) is 0.000 < 0.05, so it can be concluded that there is a difference in the average physical education learning outcomes for the control class pre-test and the control class post-test.

Thus, it can be concluded that there is an influence of differentiated learning through gross motor skills on physical fitness in physical education learning.

Regression Linear

Table 5. Results of R-Square Data for Experimental Group

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.333[a]	.111	.082	1.140

a. Predictors: (Constant), Post_Test_Eksperimen, Pre_Test_Eksperimen

Based on the results of table 5 above, the regression test calculation shows a result of 0.333, which means it is correlated and the R-Square is 0.111. This shows that there is a correlation, which means that there is an influence of differentiated learning through gross motor skills on physical fitness in physical education learning, as well as providing a good contribution.

Furthermore,individuals produced regression test results of 11.1%. The results are as calculated below:

K4 = r2 x 100%
= 0.111 x 100%
= 11.1%

DISCUSSION

In the discussion section of research that has been carried out, by reviewing data that has been obtained from the results of research that has been carried out. The aim of the results of this research is to answer the research questions that have been set in the problem formulation that has been created. Apart from that, this discussion section is used to measure achievement in research. And the results of the data processing that has been carried out are to prove the truth that is assumed in the research hypothesis. Based on the results of data processing that has been carried out and has been attached, the hypothesis that will be presented is as follows:

Differentiated learning is learning that provides flexibility and is able to accommodate students' needs to increase their potential in accordance with students' different learning readiness, interests and learning profiles (Tomlinson, 2001). In this differentiated learning, it supports students to increase gross motor activity in learning. The higher a person's level of motor ability means that the person has the potential ability to perform better motor skills (Iswahyudi & Fajar, 2019). However, a person's motor skills vary and depend on the amount of movement experience they have mastered. As stated by Kiram (2000, p. 23) in (Deswandi, Syafruddin, & Khairuddin, 2018) suggests that a person's ability to master sports motor skills varies, these differences are determined by condition and coordination abilities. owned, differences in age, movement experience, gender, frequency of training, differences in goals and motivation in learning a motor skill and differences in cognitive abilities.

In other words, increasing students' gross motor skills will help them in carrying out various more specific skills that support sports activities, as well as everyday activities, such as elements of gross motor skills, namely agility, speed, coordination, balance through differentiated learning programs. By implementing differentiated learning in the learning process through programmed gross motor skills, gross motor skills will be able to improve, which can train hand muscles, coordination with the eyes, mind, body and feet, so that children's gross motor skills will develop and improve well. Supported by the results of previous research, namely Rahman & Widiyanti, (2023) that the application of differentiated learning strategies can

improve student learning outcomes in dominant movement pattern material. Thus, teachers can use this learning strategy as an additional option as a model for improving physical education, sports and health learning outcomes.

There is the latest in the research carried out, namely by implementing differentiated learning with the aim of improving students' physical fitness by utilizing TKSI. That way, you can get good results after carrying out treatment related to differentiated learning by increasing students' physical fitness through TKSI. With the increasing influence of differentiated learning through gross motor skills on physical fitness, previous researchers, Nurlaili, Suhirman, & Lestari, (2023) supported that students like learning using interactive media, learning is fun, making students more understanding and can play a role in learning. In this way, the application of differentiated learning has a good effect on supporting students' motor skills towards physical fitness.

This is reinforced by the results of previous research by Miftahul, Taufiq, & Nasikin, (2023) that by implementing learning using the roleplaying (playing) method, students carry out learning more enjoyable because it is wrapped in a role playing method in which many activities are packaged in various games that support learning activity outcomes. physical fitness components of flexibility and agility so that learning objectives are achieved with predetermined assessment indicators. In Nurul's research (2019, p. 137) it is stated that in physical education learning, if you apply the play method, you can improve learning outcomes as well as mastery of movements according to the material being taught. And Silaban's research (2013) also stated that learning to play has an influence on students' basic movement abilities. In learning, students do not experience boredom if the learning is fun because the method of playing with several games is applied so that students do not feel tired.

Similar to the research conducted, differentiated learning in that it provides learning that is packaged in the form of play, as well as providing learning that uses various methods so that students can exploit the content of the curriculum to be studied with their understanding, teachers also provide a variety of activities that make sense so that students can understand and have information or ideas, and the teacher provides a variety of options where students can demonstrate what they have learned. Apart from that, the results of previous research by Risaldi, Herpandika, & Pratama, (2023) support the physical fitness aspect, that the results of carrying out physical activities come from the learning program and then every time a physical fitness test needs to be carried out. As stated by Trisnata, Hanief, & Bekti, (2020), students and female students in physical education learning must be supported or given motivation during the learning process. From the learning carried out every day, it is necessary to monitor the physical fitness results of the learning carried out according to the program that has been planned by the teacher through physical fitness tests for students and students.

Effective, routine and planned learning is a very important way to keep the body fresh. That way, it can automatically increase the physical fitness of each student. The implementation of good and appropriate physical education learning has been proven to have a big influence on students (Ibnu, 2017). Student involvement in physical education learning contributes to improving physical abilities which are very useful when carrying out daily activities (Kerr et al., 2018). With support from research results, to be able to improve students' physical fitness, it needs

to be supported by effective learning that supports improving the motor skills of each student. Teachers must be able to package learning that refers to improving physical fitness, one way is by implementing differentiated learning. That way, learning is delivered well, students feel happy with the process, and the end result will improve the students' physical fitness.

CONCLUSION

Based on the results of data processing and data analysis, answers to the research questions that have been asked are obtained. The conclusions obtained include the following: (1) There is an influence of differentiated learning through gross motor skills on physical fitness in physical education learning. This can be seen from the results of the P value (Sig. 2 tailed) which is acceptable, because the resulting data value is smaller than the significance value of acceptance, namely (0.000) < 0.05, then HI is accepted. In this way, the results of this research show the influence of differentiated learning through gross motor skills on physical fitness in physical education learning. (2) The magnitude of the influence of differentiated learning through gross motor skills on physical fitness in physical education learning. This can be seen from the results of data analysis carried out using the R Square test. The results showed that the magnitude of the effect between the pre-test and post-test experimental data was 0.111 x 100%. In this way, the increase in the influence of learning with differentiated programs through gross motor skills on physical fitness in physical education is 11.1%. Meanwhile, the magnitude of the influence between the pre-test and post-test control data is 0.107 x 100%. In this way, the increase in the influence of learning with the curriculum program through gross motor skills on physical fitness in physical education is 10.7%.

With these two data, it can be seen that the best contribution was obtained by the experimental group with an increase of 11.1% supported by a differentiated learning program. By providing a differentiated learning program through gross motor skills, the results have a good effect on physical fitness in physical education learning.

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