International Journal of Education and Literature

E-ISSN: 2829-6249
P-ISSN: 2829-6656

Research Article

Modification of Breast Stroke Leg Movement Exercises in Extracurricular Swimming Courses at Yos Sudarso Junior High School

Cecilia Novyanti Sitompul

Universitas Singaperbangsa Karawang; email: cecilianovyantisitompul@gmail.com

Abstract: This study aims to determine the effectiveness of breaststroke leg movement training modifications in improving swimming skills of extracurricular swimming participants at SMP Yos Sudarso. The background of this study is based on the low mastery of basic leg movement techniques in breaststroke which is one of the inhibiting factors in student achievement. The research method used is a quantitative approach with a quasi-experimental design. The subjects of the study were 20 students participating in extracurricular swimming who were selected purposively. The instrument used was an observation sheet for breaststroke leg movement technique skills. The results of the study showed that the application of training modifications, such as the use of a buoy board and variations in movements on land, significantly improved the quality and coordination of students' leg movements. Thus, training modifications have proven effective and can be used as an alternative learning approach that is fun and adaptive for beginner students in extracurricular swimming activities.

Keywords: exercise modification, leg movements, breaststroke, swimming extracurricular, SMP Yos Sudarso

1. Introduction

Physical education is a learning process that is designed and implemented with the aim of improving the affective, cognitive, and psychomotor abilities of individuals through physical activity, in order to achieve certain educational goals. The results of physical education learning are basically an important need. Through physical education, the education system in schools seeks to develop various aspects, such as health, physical fitness, critical thinking skills, emotional stability, sociality, thinking skills, and moral behavior (Prawira & Prabowo, 2021).

Physical Education, Sports and Health can improve basic movement skills and foster an honest and diligent attitude (Meirawati & Nurrochmah, 2020). Evaluation is a very important stage to find out how far learning has been implemented effectively and whether learning objectives have been achieved. In the learning process, evaluation becomes a reference for assessing the achievement of educational goals and objectives in general, including in PJOK learning (Mustafa dkk., 2019). The same thing was also expressed by Ariesta, et al. (2022), who stated that the purpose of evaluation is to provide information regarding program effectiveness, so that results, quality and efficiency can be optimized (Ariesta dkk., 2022).

In physical education, there are various aspects of movement, one of which is activity in the water. Swimming is a water sport that involves almost the entire body. In principle, swimming can be done by anyone without age restrictions, even babies who are only a few months old can be taught to swim. Basically, every human being has the natural ability to swim and regulate breathing in the water. However, over time, if not trained regularly, this ability can decrease or even disappear. In swimming lessons at school, there are several

Received: May 28, 2025
Revised: June 09, 2025
Accepted: June 19, 2025
Online Available: June 23, 2025
Curr. Ver.: June 23, 2025

styles that are taught, such as breaststroke, freestyle, backstroke, and butterfly (Priana, 2019).

One of the swimming learning materials is breaststroke. According to (Priana, 2019) breaststroke is the first stroke that people learn when they start learning to swim. Breaststroke or frog stroke is done with the chest facing the surface of the water. Unlike freestyle, in breaststroke the body remains in a stable position. Both legs kick outwards, while both arms are straightened forward, then opened to the side like a water-splitting movement, so that the body can move forward faster.

According to the Great Dictionary of the Indonesian Language, extracurricular activities are defined as activities carried out outside the programs listed in the curriculum, such as leadership training and student coaching. In general, extracurricular activities function as a forum for students who have certain interests to participate in activities that suit their talents, hobbies, personalities, and creativity. These activities can act as a means to detect student talents and are systematically designed to develop and foster student potential, as well as being a means for character formation through various activities (Arifudin, 2022).

Extracurricular activities that are required to be followed by all students aim to facilitate the development of students' talents and interests, so that they can hone skills that support achievement and character building. These activities not only focus on training, but also on social and self-recognition to help students understand their character and potential. Extracurricular activities are carried out outside of class hours, giving students the freedom to choose activities that suit their interests and talents, without disrupting mandatory class hours, because the time and place are adjusted proportionally (Priana, 2019).

Based on the data from the pre-research observation results conducted by the researcher on October 27, 2024 during the Extracurricular Swimming activities at Yos Sudarso Middle School in Yonif 305, it was seen that there were still many students who could not practice the breaststroke leg technique correctly and also the training methods used still tended not to develop the technique.

This study (Aufiyazzahrah 2021) aims to determine the category of leg strength level, the category of arm strength level, and the relationship between leg and arm strength with breaststroke swimming ability. This study uses a descriptive approach with independent variables in the form of leg strength and arm strength, and the dependent variable in the form of breaststroke swimming ability. The population in this study were grade VIII students of SMP Negeri 2 Pangkajene, with a sample of 20 people. The data were analyzed statistically using the SPSS program. The results showed that: 1) Most students have leg strength in the moderate category of 10.0%. 2) Most students have arm strength in the moderate category of 5.0%. 3) There is a significant relationship between leg and arm strength and breaststroke swimming ability in grade VIII students of SMP Negeri 2 Pangkajene.

Leg movements in breaststroke swimming can be done as effectively as possible if the muscles in the legs are supported by good flexibility. According to the study, there is a significant difference in the effect of training using a floater on breaststroke swimming achievements, which is applied to the GAC swimming club at the Sukapura swimming pool, Dadaha Tasikmalaya. The difference between this study and previous studies is in the training movements used in training, namely the leg muscle strength training method for breaststroke leg techniques. In this regard, the researcher is interested in conducting research on the title "Modification of Breaststroke Leg Movement Training in Extracurricular Activities at SMP Yos Sudarso.

2. Literatur review

1. Based on relevant research by Nadwi Syam (2018), the purpose of this study was to determine the relationship between leg muscle power and breaststroke swimming ability. The study entitled "The Relationship between Leg Muscle Explosive Power and Arm Muscle Strength to Breaststroke Swimming Ability in PR. Garuda Laut Makassar Swimming Athletes" used the population of PR. Garuda Laut Makassar swimming athletes, with a sample of 30 athletes. The results of the study showed that: (1) There is a significant relationship between leg muscle explosive power and breaststroke swimming ability, with a value of $\beta = 0.760$ and Sig. = 0.000 ($P < 0.05$). (2) There is a significant relationship between arm muscle strength and breaststroke swimming ability, with a value of $\beta = 0.807$ and Sig.

= 0.000 (P < 0.05). (3) Simultaneously, leg muscle explosive power and arm muscle strength have a significant relationship to 20-meter breaststroke swimming ability, with a value of Ro = 0.851 and Sig. = 0.000 (P < 0.05) (Syam, 2018).

2. Based on relevant research by Suheris Penara (2015), the purpose of this study was to determine the relationship between arm muscle strength and leg muscle power to breaststroke swimming ability. The study entitled "The Relationship between Arm Muscle Strength and Leg Muscle Power with Breaststroke Swimming Ability" was conducted on Penjaskesrek FKIP Unsyiah students of Class of 2011, with a sample of 132 people. The results of the study showed that: (1) There is a positive and significant relationship between arm muscle strength and breaststroke swimming ability, with a correlation value (r = 0.70), where arm muscle strength contributes 49% to breaststroke swimming ability; (2) There is a positive and significant relationship between leg muscle power and breaststroke swimming ability, with a correlation value (r = 0.90), where leg muscle power contributes 81% to breaststroke swimming ability; (3) There is a positive and significant relationship between arm muscle strength and leg muscle power simultaneously to breaststroke swimming ability, with a correlation value (Ry.x1x2 = 0.97) (Razali & Putra, 2015).

3. Based on relevant research by Priana (2019), entitled "The Effect of Pull Buoy Training Aids on Breaststroke Swimming Performance", the problem found was that the thighs tended to pull forward, causing frontal resistance (resistance from the front). This is a technical error that needs to be corrected immediately so that it does not become a habit that is difficult to change. Therefore, the researcher used a pull buoy floatation aid that was clamped on the thighs when performing breaststroke leg movements, with the aim that the thighs would not be pulled forward and could widen to the side to minimize resistance. The method used in this study was an experiment with research subjects consisting of 20 people who were members of the GAC (Galunggung Aquatic Club) swimming club who trained in Sukapura Dadaha, Tasikmalaya City. The sampling technique was carried out using total sampling. The results of the hypothesis test showed that training using a pull buoy aid had a significant effect on breaststroke swimming performance in members of the GAC swimming club at the Sukapura, Dadaha, Tasikmalaya swimming pool.

3. Method

This research uses a quantitative approach (Sugiyono, 2017) states that quantitative research is research based on positivism, which applies random sampling techniques, collects data using research instruments, and analyzes data quantitatively or statistically in order to test the proposed hypothesis. This study aims to determine the extent to which the training results of extracurricular swimming students have increased related to leg movement training applied to the breaststroke leg swimming technique in extracurricular activities at SD Yos Sudarso with the help of training modifications.

The method used in this research is the experimental method. According to (Sudaryono, 2017), Experimental research is an effective type of research to evaluate hypotheses related to cause-effect relationships. Because this approach has the right techniques to solve research problems, this experimental method is applied in this study.

Related to the title raised, "Method of Leg Movement Training for Breaststroke Leg Technique in Extracurricular Activities at SD Yos Sudarso," the research method used is an experimental method combined with a descriptive approach to describe the existing phenomenon using numerical data. In this study, all students who take extracurricular activities at SMP Yos Sudarso will be considered as the population or object of study to be generalized. Based on the results of the observation, it was found that when practicing leg movement training for breaststroke leg techniques, there were still students from the swimming extracurricular who made mistakes in applying the technique. Therefore, the sample in this study was 20 students from the swimming extracurricular activities at SD Yos Sudarso.

4. Result and discusion

The author conducted this research at Yos Sudarso Junior High School located at Jl. Ki Hajar Dewantara (Behind the Market) No. 14. Nagasari Village, West Karawang District, Karawang Regency 41312. Tel. (0267) 8454472. Yos Sudarso School was

established in 1970. The establishment of Yos Sudarso School was initially initiated by a group of people at the Parish of Christ the King Karawang. The initial activities of Yos Sudarso School were carried out next to the old Catholic Church building (meeting hall) located at Jalan Babakan Cianjur. The positive response from the Karawang community made Yos Sudarso School continue to grow. Seeing the great opportunity to participate in building the Karawang community through education, finally the management of Yos Sudarso School was taken over by the Salib Suci Bandung Foundation in 1973, and since then the school location has been moved to Jalan Belakang Pasar No. 14.

A. Data description

Data description is a description of the data used in the study. When testing this data description, the researcher tries to find out the description or condition of the respondents who are the samples of this study. The research data was obtained through a breaststroke swimming skills test at SMP Yos Sudarso. To obtain an expression of the quality of each variable in this study, a hypothesis test formula can be used or what is called a paired t-test assisted by SPSS.27. Before entering the t-test, the researcher first looks for a normality test and a homogeneity test assisted by SPSS.27, as follows:

1. Deskripsi Hasil Penelitian

Tabel 4.1. Statistics Descriptive

Descriptive Statistics						
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Pretes	20	7	10	175	8,75	,910
Postest	20	15	24	379	18,95	2,665
Valid N (listwise)	20					

Source: SPSS 27 data processing

The table above shows the students' scores with breaststroke leg movement training modifications in swimming extracurricular activities at SMP Yos Sudarso. Before conducting the research, the researcher knew the initial conditions. In the pretest, the highest score obtained was 10 and the lowest score was 7, and the average score was 8.75. Meanwhile, after conducting the research, the posttest score for passing ability increased to the highest score of 24, the lowest score of 15, and the average was 18.95.

2. Uji Normalitas

Normality testing uses the Shapiro-Wilk test because the number of samples is less than 50. In this test, the hypothesis of the sample coming from a normally distributed population will be tested, for acceptance or rejection by comparing the Asymp sig price with 0.05. The criteria for accepting the hypothesis is if Asymp. Sig is greater than 0.05, if it does not meet these criteria, the hypothesis is rejected.

Tabel 4.2. Uji Normalitas

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretes	,245	20	,03	,859	20	,07
Postest	,203	20	,30	,889	20	,26
a. Lilliefors Significance Correction						

Source: SPSS 27 data processing

Based on table 4.2 above, the significance value (p) of the pretest in the Shapiro-Wilk test is 0.07 (p> 0.05), so based on the Shapiro-Wilk normality test, the pretest data is normally distributed. Then the significance value (p) of the Posttest in the Shapiro-Wilk test is 0.26 (p> 0.05), so based on the Shapiro-Wilk normality test, the posttest data is normally distributed.

3. Uji homogenitas

Homogeneity testing was conducted on pretest and posttest data. At a significant level

of α = 0.05. The criteria for homogeneity testing are:
1) If sig> 0.05 then the data is homogeneous and
2) If sig sig <0.05 then the data is not homogeneous
The results of the homogeneity test using SPSS 27 on the Pretest and Posttest values obtained the following results:

Tabel 4.3. Uji Homogenitas

ANOVA					
Post Test					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	58,042	3	19,347	4,025	,026

Source: SPSS 27 data processing

Based on the analysis results in the Test of Homogenety ANOVA table, F = 4.025, df = 3, and Sig = 0.26. Because the Sig value of 0.26> 0.05, it can be concluded that the data variance in the pretest and posttest values is homogeneous.

4. Uji Hipotesis

The hypothesis test used is the Paired Samples Test. This test is conducted to determine whether or not there is an effect of using breaststroke leg movement training modifications on swimming extracurricular activities at SMP Yos Sudarso. The guidelines or basis for decision making are as follows:
If tcount> ttable then H0 is rejected and H1 is accepted, meaning that the use of problem-based learning has an effect on the use of breaststroke leg movement training modifications on swimming extracurricular activities at SMP Yos Sudarso.
If tcount <ttable then H0 is accepted H1 is rejected, meaning that the use of problem-based learning has no effect on the use of breaststroke leg movement training modifications on swimming extracurricular activities at SMP Yos Sudarso.

Tabel 4.4. Paired Samples Statistics

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test	8,75	20	,910	,204
	Post Test	18,95	20	2,665	,596

Source: SPSS 27 Data Processing

The Paired Samples Statistics table shows the descriptive value of each variable in the paired sample.
The Initial Test has an average value (mean) of 8.75 from 20 data. The distribution of data (Std. Deviation) obtained is 0.910 with a standard error of 0.204.
The Final Test has an average value (mean) of 18.95 from 20 data. The distribution of data (Std.Deviation) obtained is 2.665 with a standard error of 0.596.

This shows that the final test on the data is higher than the initial test. However, the distribution range of the final test data also becomes wider and with a higher standard error.

Tabel 4.5. Paired Samples Test

Paired Samples Test								
	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)

Pair 1	Pre Test - Post Test	-10,200	2,353	0,526	-11,301	-9,099	-19,386	19	0,000

Source: SPSS 27 Data Processing

Based on the results of data processing using the SPSS version 27 application in the hypothesis test using the Paired Samples Test. In the pretest and posttest value columns, the Mean = 10.200, Standard Deviation = 2.353, t = 19.386, df = 19, and Sig. (2-tailed) = 0.000 were obtained.

From the output in the table above, the Paired Samples Test Table is the main table of the output that shows the results of the test carried out. This can be seen from the significance value (2-tailed) in the table. The significance value (2-tailed) of this case example is 0.000 ($p < 0.05$). So that the results of the initial test and final test experienced significant changes (meaningful).

Based on the descriptive statistics of the initial test and final test, it is proven that the final test is higher. It can be concluded that the use of breaststroke leg movement training modifications has an effect on swimming extracurricular activities at SMP Yos Sudarso.

B. Pembahasan Hasil Penelitian

The results of this study indicate that there is a significant influence on breaststroke leg movement training in swimming extracurricular activities at SMP Yos Sudarso. This study was motivated by the low breaststroke ability of extracurricular students at SMP Yos Sudarso. This study aims to determine how much modification of breaststroke leg movement training affects breaststroke ability in swimming extracurricular activities at SMP Yos Sudarso. This study is a quantitative study, using an experimental method with a research instrument in the form of a test. The population of this study was 20 students. While the sample taken in this study used Total sampling, so the sample size taken in this study was 20 students in swimming extracurricular activities.

This study aims to determine the effect of breaststroke leg movement training modifications on breaststroke ability in swimming extracurricular activities at SMP Yos Sudarso. Based on the results of data analysis, it was found that the application of breaststroke leg movement training modifications had a significant effect on improving students' swimming abilities. The average pretest score of 8.75 increased to 18.95 in the posttest, with a standard deviation indicating consistency of the results. The Shapiro-Wilk normality test confirmed that the data were normally distributed (pretest: 0.07; posttest: 0.26), and the Anova homogeneity test (0.26> 0.05) indicated homogeneous data variance. Furthermore, the hypothesis test using the Paired Samples Test produced tcount> ttable, so H0 was rejected and H1 was accepted. This proves that the use of breaststroke leg movement training modifications has an effect on swimming extracurricular activities at SMP Yos Sudarso.

5. Comparison

The results of this study indicate that there is a significant influence on breaststroke leg movement training in swimming extracurricular activities at SMP Yos Sudarso. This study was motivated by the low breaststroke ability of extracurricular students at SMP Yos Sudarso. This study aims to determine how much modification of breaststroke leg movement training affects breaststroke ability in swimming extracurricular activities at SMP Yos Sudarso. This study is a quantitative study, using an experimental method with a research instrument in the form of a test. The population of this study was 20 students. While the sample taken in this study used Total sampling, so the sample size taken in this study was 20 students in swimming extracurricular activities.

Conclusion

This study shows that systematic and continuous modification of leg movement exercises has a positive effect on improving breaststroke leg swimming techniques in extracurricular swimming students at SMP Yos Sudarso. Through training methods carried out both on land and in water, students experienced significant improvements in leg movement coordination, leg propulsion, and gliding efficiency in the water. This is evidenced by the comparison between the pre-test and post-test results which showed an overall increase in ability.

Reference

[1] T. W. Ariesta, R. Pelana, and Y. Setiakarnawijaya, "Evaluation of shooting sports achievement development program at PB PERBAKIN," *Gladi: Jurnal Ilmu Keolahragaan*, vol. 13, no. 1, pp. 47–60, 2022. [Online]. Available: https://doi.org/10.21009/GJIK.131.05
[2] O. Arifudin, "Optimalisasi Kegiatan Ekstrakurikuler dalam Membina Karakter Peserta Didik," *Jurnal Ilmiah Ilmu Pendidikan*, vol. 5, 2022.
[3] N. Meirawati and S. Nurrochmah, "Kemampuan Kecepatan Gerak dan Daya Ledak Otot Siswa PPLP Jatim di Kediri Cabang Olahraga Atletik," *Gelanggang Pendidikan Jasmani Indonesia*, vol. 4, no. 1, p. 28, 2020. [Online]. Available: https://doi.org/10.17977/um040v4i1p28-34
[4] P. S. Mustafa, M. E. Winarno, and S. Supriyadi, "Penilaian Pendidikan Jasmani, Olahraga, dan Kesehatan pada Sekolah Menengah Pertama Negeri Kota Malang," *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, vol. 4, no. 10, p. 1364, 2019. [Online]. Available: https://doi.org/10.17977/jptpp.v4i10.12845
[5] A. Y. Prawira and E. Prabowo, "Model Pembelajaran Olahraga Renang Anak Usia Dini: Literature Riview," *Jurnal Educatio*, vol. 7, 2021.
[6] A. Priana, "Pengaruh Alat Bantu Latihan Pull Buoy Terhadap Prestasi Renang Gaya Dada," *Journal of S.P.O.R.T.*, vol. 3, 2019.
[7] P. Razali and S. Putra, "Hubungan kekuatan otot lengan dan power otot tungkai dengan kemampuan renang gaya dada pada mahasiswa Penjaskesrek FKIP Unsyiah angkatan 2011," *Jurnal PJKR*, vol. 10, 2015.
[8] Sudaryono, *Metodologi Penelitian: Teori dan Praktik*. Jakarta: Prenadamedia Group, 2017.
[9] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta, 2017.
[10] N. Syam, "Hubungan Daya Ledak Tungkai dan Kekuatan Otot Lengan terhadap Kemampuan Renang Gaya Dada pada Atlet Renang PR. Garuda Laut Makassar," 2018.