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Original Article

Ludic physical activities to teach Freestyle Swimming to nine-year old children

Elvis Gaston Quinto Cevallos[1*] https://orcid.org/0000-0002-9309-125X

[1]University of Guayaquil. Ecuador.
[*]Corresponding author: elvis.quintoc@ug.edu.cu

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ABSTRACT

Introduction: Optimization of freestyle swimming training is a critical starting point for this sport in life. However, there are still methodological flaws consisting of the integration of ludic activities to the process.

Aim: To implement ludic physical activities in freestyle swimming teaching to nine-year-old children.

Materials and methods: The methodology relied on methods and techniques, which helped apply the proposal to the sample, with favorable results that corroborated the validity of the proposal. The interpretation of results from the survey was done to design a guide of ludic activities.

Results: The results were positive and permitted to corroborate the proposal. The test results were interpreted to measure the impact of ludic activities. It was defined that ludic activities stimulate children to participate actively and flexibly in the process of sports initiation in swimming.

Conclusions: The exercises that will be part of the guide should adjust to the various needs of boys and girls, as they develop different learning modes.

Keywords: swimming, freestyle, ludic activities.

INTRODUCTION

Today, sports in the Republic of Ecuador is becoming more inclusive through physical activity and sports programs offered by the Ministry of Sports, and therefore the significance of extending the process to the provinces and cantons of the country, using new teaching techniques and trends is gainign relevance.

The continuous interaction of humans with the aquatic environment throughout history has generated the establishment and development of physical work.

Time and specialization have given rise to recreational aquatic sports activities, which, in turn, are directed to every population group living in the communities, particularly children of short age.

In this social, cultural, and sports environment, swimming has become a sport that promotes the acquisition of physical skills and abilities, complementing the child's integrated development.

According to Quinto (2016), every teaching-learning process associated with swimming has basic principles that must be taken into account.

- Swimming, not a single style, should be learned.
- Learning takes place in an aquatic environment.
- The notion of learning duration does not exist.
- The order of successive teaching stages must be rigorously respected.
- It is a permanent dynamic action.

For a student to master the skill of swimming and become a swimmer, it is necessary to create an arrangement or step-by-step methods in teaching, which will be called "teaching stages", mhich must be fulfilled as a rule, as all share special complementing sequencing attributes, as follows:

It is learning, in which the students start from zero and it ends when they have the capacity to solve issues like,

- Complete familiarization with water.
- Correct breathing.
- Right time to dive.
- Minimum swimming distance.

The teaching-learning process lies on five progressions:

- Establishment
- Floating.

- Breathing.
- Propulsion.
- Jumping.

These progressions are considered basic before starting sports practice. In general physical activity, pre-sports games are developed in practically every sport. Veloz, K. & Palchisaca, Z. (2021) suggested a program of pre-sports games for implementation in the teaching-learning process of swimming, which yielded satisfactory results.

Other authors (Peñafiel, G.,2019) also recommended a guide of ludic activities to improve the swimming teaching process in 5-6 year-old children, using new pedagogic strategies.

The proposal made by Lizama, N., *et. al*., (2019) was interesting; it was based on a game used as part of a methodological proposal for ludic aquatic establishment for 6-10 year-old children who showed progressive advances during the teaching-learning process in terms of aquatic content mastery.

Freestyle in swimming

The crawl swimming style, also known as freestyle, is done by moving the arms alternately. It has a recovery phase (air), and a traction phase. The legs work as propulsion, and are responsible for keeping the floating level. The arms are mostly used for moving forward.

In crawl swimming, breathing is done by rotating, which ends up being lateral breathing. But breathing is not always compulsory, on many occasions, swimmers opt to skip that step to keep the same pace. The stroke goes on the side of the body, with alternate movements; when one arm hits the water, the other goes out; when a leg goes down, the other goes up, thus keeping a balance of legs, arms, and hip rotation.

Some authors (Mendieta, H. 2021) have established their didactic strategies to teach the specific motor skills of the freestyle in 6-8 year-old children. These methods do not include the ludic activity and have shown flaws that hinder the teaching-learning process associated with the specific motor skills of the freestyle, particularly.

Palma, J. (2021) made a guide containing the fundamentals of swimming, to develop freestyle in children who practice swimming, and eliminate the pedagogic and methodological lack of knowledge by teachers and coaches. These fundamentals became the pillars of planned work, where activities must always be systematic and progressive, depending on children's needs.

Authors like Rivera and M. & Valdivia, G. (2017) developed a program of ludic games for learning the techniques of the crawl style in swimming in older students, so they could be trained to enhance their capacities by developing their physical conditions and prevent a series of complications through the practice of this sport. The program was based on a

series of activities distributed according to their chronological age, the morph-functional action, and the level of physical performance of each learner, having satisfactory results at the end of the work suggested, which demonstrated the influence of ludic games.

Although the utilization of ludic games to learn the technical fundamentals of swimming is part of the curriculum of Physical Education, the lack of proper structure and economic means leads to faulty teaching, which is present in most institutions. Swimming is known to be one of the oldest sports, which provides comprehensive training and health, and has no limitations. Its practice helps overcome many situations, increasing self-esteem. It can be practiced since infancy, and until old age, a quality that other sports often lack (Salass, W. 2019).

Likewise, Fuentes, J. (2020) validated the application of ludic activities to learn aquatic motor skills, and the freestyle in older students.

In the province of Guayas, Samborondon Canton, a preliminary field study revealed that there is no swimming program directed to the development of the basic qualities of swimming based on ludic activities.

The main sign derived from this issue is the lack of motivation of children due to the absence of a plan of ludic activities, and the poor development of aquatic skills and dexterities.

All this has been caused by different reasons and conflicts, such as the concern of executives to implement new ludic techniques that favor the practice of swimming.

In fact, the formation of motor skills and basic qualities that help promote sports talents, or associated with sports initiation, is far from developing through planning and constant practice.

Lastly, sports development has stalled due to the lack of infrastructure, and the absence of a method and guide of ludic activities, which has a direct effect on the lack of motivation of children who are not allowed to receive active, ludic, and flexible preparation and education.

In sight of the different causes and consequences, the implementation of the Guide of Ludic Activities will contribute to a greater development of the basic swimming qualities.

The inclusion of ludic activities offers a progression of the aquatic environment; the different aerobic exercises will form a solid base in the children, regarding motor skills (Quinto, 2016). Hence, the aim of this research is to implement a system of ludic physical activities to teach freestyle swimming to nine-year-old children.

MATERIALS AND METHODS

The research was experimental, in the form of explicative quasi-experiment, which confirm the effectiveness of the system of ludic activities to teach freestyle swimming to 34 nine-year-old children at the Municipal Sports School of Samborondon Canton, in the province of Guayas, the Republic of Ecuador. The population of the study consisted of 100% swimming students at the analysis unit. The 17-student groups were made according to the training sessions.

The sampling arrangement permitted the conception of a control group made of 17 children in the morning session, and the experimental group was made up of 17 students in the afternoon session. The control group continued working on the traditional methodology, whereas the experimental group was part of an intervention with the ludic activities suggested to optimize the teaching of the freestyle in swimming.

To corroborate the research hypothesis, the Mann Whitney U test for ordinal qualitative variables, was performed. The test was applied in the pre-test to check the differences between the test related to breathing, jumping, floating, and locomotion, and after post-test of ludic activities. The characteristics of the tests are described as follows:

Test No. 1: Measuring breathing when crawl swimming, coordinating rotation with lateral breathing.

- Test No. 2: Jumping into the water.
- Test No. 3: Moving the legs for propulsion, which are also responsible for keeping the floating level.
- Test No. 4: Freestyle swimming for 30 meters. The level of advance and the errors made were measured.

The number of errors made by the children in each test was considered to assign the Very Good, Good, Average, and Bad categories as shown in the table below.

Table 1. - Assessment key by the number of errors made in each test

No.	Number of errors	Category
1	1 technical error maximum	Very good (VG)
2	2-3 errors	Good (G)
3	4 errors	Average (A)
4	More than 4 errors	Bad (M)

Source: The author
Made by: Elvis Gastón Quinto Cevallos

RESULTS AND DISCUSSION

The pre-test and post-test results of the control group are shown below (Table 2).

Table 2. - Skill test for freestyle swimming

Pre-test: Control group.....Post-test: Control group

Test	VG		G	%	A	%	B	%	Total	Test	VG	%	G	%	A	%	B	%	Tot.
Test No. 1. Breathing	0	0	0	0	3	18	14	82	17	Test No. 1 Breathing	1	5	12	70	4	24	0	0	17
Test No. 2. Jump	0	0	0	0	4	24	13	76	17	Test No. 2. Jump	1	5	11	65	5	11	0	0	17
Test No. 3. Floating	0	0	0	0	3	18	14	82	17	Test No. 3. Floating	2	11.7	12	70	5	11	0	0	17
Test Nº 4 Locomotion	0	0	0	7	4	24	13	76	17	Test Nº 4 Locomotion	1	5	11	65	5	11	0	0	17

Source: The author
Made by: Elvis Gastón Quinto Cevallos

The pre-test and post-test results of the experimental group are shown below (Table 3).

Table 3. - Skill test for freestyle swimming

Pre-test: Experimental group.....Post-test: Experimental group

Test	VG	%	G	%	A	%	B	%	Tot.	Test	VG		G	%	A	%	B	%	Tot.
Test No. 1. Breathing	**0**	**0**	**0**	**0**	**3**	**18**	**14**	**82**	**17**	Test No. 1 Breathing	**15**	**89**	**2**	**11**	**0**	**0**	**0**	**0**	**17**
Test No. 2. Jumping	**0**	**0**	**0**	**0**	**4**	**24**	**13**	**76**	**17**	Test No. 2. Jumping	**13**	**76**	**4**	**24**	**0**	**0**	**0**	**0**	**17**
Test No. 3. Floating	**0**	**0**	**0**	**0**	**1**	**6**	**16**	**94**	**17**	Test No. 3. Floating	**16**	**94**	**1**	**6**	**0**	**0**	**0**	**0**	**17**
Test Nº 4 Locomotion	**0**	**0**	**0**	**0**	**3**	**18**	**14**	**82**	**17**	Test Nº 4 Locomotion	**17**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**17**

Source: The author
Made by: Elvis Gaston Quinto Cevallos

A proposal of a system of ludic sports activities

According to the previous authors, the following activities were suggested for each type of basic quality (Table 4), (Table 5), (Table 6), (Table 7), and (Table 8).

Table 4. - System of ludic activities for diving

LUDIC ACTIVITIES FOR DIVING				
BASIC QUALITY	**Objective**	**Activity**	**Description**	**Variant**
Diving	To achieve complete diving while developing time-space activation.	Diving with support and sign description.	The activity will be done by couples, two children will dive while hanging from the edge of the pool, one of the children will make signs with their hands or a gesture with the face. After emerging, the other child will describe the sign or face gesture made by their partner.	Trying to sing while being underwater so that the other child can listen.
		Diving to find objects.	The child will dive and try to reach objects on the bottom of the pool. It is recommended for shallow areas.	The same exercise is done by two children, either can help the other dive completely to reach the objects on the bottom of the pool.
		Diving through natural and material obstacles.	The child will dive and swim between the legs of their partner or partners who are forming a natural tunnel.	The child should dive and swim through hula-hoops held by a partner.

Source: The author
Made by: Elvis Gastón Quinto Cevallos

Table 5. - System of ludic activities for breathing

LUDIC ACTIVITIES FOR BREATHING				
BASIC QUALITY	**Objective**	**Activity**	**Description**	**Variant**
Breathing	To achieve proper breathing while diving	Counting bubbles	Two children will stand face to face, and will make bubbles simultaneously when underwater, then they will hold their breath. The action can be repeated when making the bubbles.	Making bubbles continuously to last the longest underwater.
		Who can hold it longer?	Two children or more will dive and try to stay underwater the longest possible time, the bubbles can be used at any time of diving.	The same exercise from above, but this time the child can go to the surface to take in air.

Source: The author
Made by: Elvis Gastón Quinto Cevallos

Table 6. - System of ludic activities for jumping

LUDIC ACTIVITIES FOR JUMPING				
BASIC QUALITY	**Objective**	**Activity**	**Description**	**Variant**
Jumping	To build safety when entering the water.	Free jumping and diving.	The child will be able to perform any type of jump, and dive completely. Jumps can be created.	Jumping in different ways and swimming through hula-hoops.
		Jumping by pairs of groups.	Jumping holding hands in different ways.	Jumping by pairs holding hands and complete diving holding the breath as long as possible.

Source: The author
Made by: Elvis Gastón Quinto Cevallos

Table 7. - System of ludic activities for floating

LUDIC ACTIVITIES FOR FLOATING				
BASIC QUALITY	**Objective**	**Activity**	**Description**	**Variant**
Floating	To develop different floating ways through group exercises.	Chain floating	It will require two or more children; one will hold the other's legs like a board. Floating will be pushing from the wall, surfing up for can be done freely.	The position can change, one can float on their back, and the other in crawl position.
		Floating in different positions making figures.	Two children or more will create figures by floating, such as stars, letters, etc.	When the teacher blows the whistle the children can change their positions.

Source: The author
Made by: Elvis Gastón Quinto Cevallos

Table 8. - System of ludic activities for locomotion

LUDIC ACTIVITIES FOR LOCOMOTION				
BASIC QUALITY	**Objective**	**Activity**	**Description**	**Variant**
Locomotion	To develop different floating ways through group exercises.	The shark	The teacher will indicate the type of movement, one child will play the part of a shark, whereas the others will be the fishes. The shark must follow and catch the fishes.	When a fish is caught, it will be the shark.
		Imitating movements	A child will make a move and the rest will imitate them, and so successively, every child will make their own movement so that everyone can imitate them.	When the teacher blows the whistle the children can change their floating positions.

Source: The author
Made by: Elvis Gastón Quinto Cevallos

The Mann-Whitney U test (ordinal qualitative variables) was used to corroborate the hypothesis of the research regarding independent samples. The assessing categories were presented to all the group members (control and experimental) in the tests applied to each group during the pre-test, and post-test. The experimental test led to the following hypotheses:

Ho: If P- value ≥ α=0.05, there is no significant difference in the pre-test and post-test results between the control and experimental groups.

Hi: If P- value < α=0.05, there is a significant difference in the pre-test and post-test results between the control and experimental groups. It produced the following results (Table 9) and (Table 10).

Table 9. - Results of the breathing tests to the control and experimental groups in the pre-test

Test[a] statistics	
	BREATHING
Mann-Whitney U	127.500
Wilcoxon W	280.500
Z	-.886
Asymptotic significance (two-sided)	0.375
Exact significance [2* (one-sided)]	.563[b]

a. Group variable: TYPE OF GROUP
b. Non-corrected for ties.
Source: The author
Made by: Elvis Gastón Quinto Cevallos

The results show that the asymptotic significance was p= 0.375 ≥ α=0.05, showing no significant differences during the pre-test of the breathing test, in the control and experimental groups.

Table 10. - Results of the jumping tests to the control and experimental groups in the pre-test

Test[a] statistics	
	JUMPING
Mann-Whitney U	132.000
Wilcoxon W	285.000
Z	-.559
Asymptotic significance (two-sided)	.576
Exact significance [2* (one-sided)]	.683[b]

a. Group variable: TYPE OF GROUP
b. Non-corrected for ties.
Source: The author
Made by: Elvis Gastón Quinto.

The results show that the asymptotic significance was p= 0.576 ≥ α=0.05, showing no significant differences during the pre-test of the jumping test, in the control and experimental groups (Table 11).

Table 11. - Results of the floating tests to the control and experimental groups in the pre-test

Test[a] statistics	
	FLOATING
Mann-Whitney U	141.500
Wilcoxon W	294.500
Z	-.156
Asymptotic significance (two-sided)	.876
Exact significance [2* (one-sided)]	.919[b]

a. Group variable: TYPE OF GROUP
b. Non-corrected for ties.
Source: The author
Made by: Elvis Gastón Quinto.

The results show that the asymptotic significance was p= 0.876 ≥ α=0.05, showing no significant differences during the pre-test of the floating test, in the control and experimental groups (Table 12).

Table 12. - Results of the locomotion tests to the control and experimental groups in the pre-test

Test[a] statistics	
	LOCOMOTION
Mann-Whitney U	133.500
Wilcoxon W	286.500
Z	-.475
Asymptotic significance (two-sided)	.635
Exact significance [2* (one-sided)]	.708[b]

a. Group variable: TYPE OF GROUP
b. Non-corrected for ties.
Source: The author
Made by: Elvis Gastón Quinto Cevallos

The results show that the asymptotic significance was p= 0.635 ≥ α=0.05, showing no significant differences during the pre-test of the locomotion test, in the control and experimental groups.

Below are the results of the control and experimental groups in the post-tests, following the application of the proposal (Table 13).

Table 13. - Results of the breathing tests to the control and experimental groups in the post-test

Test[a] statistics	
	BREATHING
Mann-Whitney U	38.000
Wilcoxon W	191.000
Z	-4.076
Asymptotic significance (two-sided)	.000
Exact significance [2* (one-sided)]	.000[b]

a. Group variable: TYPE OF GROUP
Source: The author
Made by: Elvis Gastón Quinto.

The results show that the asymptotic significance was p= 0.00< α=0.05, showing highly significant differences during the post-test of the breathing test, in the control and experimental groups. The proposal demonstrated its functionality as well as significant differences in the categories assigned to the two groups (Table 14).

Table 14. - Results of the jumping tests to the control and experimental groups in the post-test

Test[a] statistics	
	JUMPING
Mann-Whitney U	43.000
Wilcoxon W	196.000
Z	-3.844
Asymptotic significance (two-sided)	.000
Exact significance [2* (one-sided)]	.000[b]

a. Group variable: TYPE OF GROUP
Source: The author
Made by: Elvis Gastón Quinto.

The results show that the asymptotic significance was p= 0.00< α=0.05, which underwent highly significant differences during the post-test of the jumping test, in the control and

experimental groups. The proposal demonstrated its functionality as well as significant differences in the categories assigned to the two groups (Table 15).

Table 15. - Results of the floating tests to the control and experimental groups in the post-test

Test[a] statistics	
	FLOATING
Mann-Whitney U	29.000
Wilcoxon W	182.000
Z	-4.370
Asymptotic significance (two-sided)	.000
Exact significance [2* (one-sided)]	.000[b]

a. Group variable: TYPE OF GROUP
Source: The author
Made by: Elvis Gastón Quinto.

The results show that the asymptotic significance was p= 0.00< α=0.05, which underwent highly significant differences during the post-test of the floating test, in the control and experimental groups. The proposal demonstrated its functionality as well as significant differences in the categories assigned to the two groups (Table 16).

Table 16. - Results of the locomotion tests to the control and experimental groups in the post-test

Test[a] statistics	
	LOCOMOTION
Mann-Whitney U	17.000
Wilcoxon W	170.000
Z	-4.939
Asymptotic significance (two-sided)	.000
Exact significance [2* (one-sided)]	.000[b]

a. Group variable: TYPE OF GROUP
Source: The author
Made by: Elvis Gastón Quinto.

The results show that the asymptotic significance was p= 0.00< α=0.05, with highly significant differences during the post-test of the locomotion test, in the control and

experimental groups. The proposal demonstrated its functionality as well as significant differences in the categories assigned to the two groups (Table 16).

The results achieved during the post-test to the four tests applied to the control and experimental groups confirm the refusal of the null hypothesis Ho, and embrace the alternative hypothesis Hi. The four tests confirmed the absence of significant differences during the pre-test, between the control and experimental groups, resulting in P-value ≥ α=0.05 in the breathing, jumping, floating, and locomotion tests.

The post-test results confirmed the alternative hypothesis Hi, since the results from the four tests for P- value Sig.0.00 < α=0.05, showed a highly significant difference in the pre-test and post-test results between the control and experimental groups.

CONCLUSIONS

The ludic activities will always be part of the sports context of swimming, as they ensure the active and flexible participation of children, and therefore an analysis of the needs and priorities of children to establish a guide that facilitates the fulfillment of basic quality objectives in swimming.

The theoretical rationale was important to achieve the mastery of each basic skill in the freestyle, which could contribute to safety and confidence in the aquatic environment.

The exercises that will be part of the guide should be adjustable to the various needs of boys and girls, since they develop different learning modes.

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