

Technical foundations of Volleyball in tenth grade students of Basic Higher Education

Fundamentos técnicos del Voleibol en estudiantes de décimo grado de Educación Básica Superior

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ABSTRACT

The research carried out a pre-experimental study in the Physical Education class with a group of 20 students, to determine the correlation between the methodological steps variables in the teaching of the technical foundations of Volleyball, and the technical learning in the subjects, with the support of the Kolmogorov-Smirnov statistical test. The results of the initial test showed the deficiencies in the technical domain of the basic fundamentals of the game of Volleyball and the relevance of the traditional or technical model in relation to the requirements of the current Physical Education Curriculum. The teaching methodology used in the sports practice block demonstrated its effectiveness in learning the Volleyball theoretical foundations as there is a significant difference between the results of the post-test and the pre-test.

Keywords: Methodology; Volleyball; Technical fundamentals; Technical model; Physical education; Teaching-learning process

RESUMEN

La investigación realizó un estudio pre experimental en la clase de Educación Física con un grupo de veinte estudiantes, para determinar la correlación entre las variables pasos metodológicos en la enseñanza de los fundamentos técnicos del Voleibol, y el aprendizaje técnico en los sujetos, con el apoyo de la prueba estadística de Kolmogorov-Smirnov. Los resultados de la prueba inicial evidenciaron las carencias en el dominio técnico de los fundamentos básicos del juego de Voleibol y la pertinencia del modelo tradicional o técnico en relación a las exigencias del Currículo vigente de

Educación Física. La metodología de la enseñanza empleada en el bloque de prácticas deportivas demostró su efectividad en el aprendizaje de los fundamentos teóricos del Voleibol al existir una diferencia significativa entre los resultados del post test y el pre test.

Palabras clave: Metodología; Voleibol; Fundamentos técnicos; Modelo técnico; Educación física; Proceso de enseñanza-aprendizaje

INTRODUCTION

The development of Volleyball has been taking steps of progress in regard to the teaching-learning process of its technical foundations, which has allowed the development of participation and competition at an international level. In the evolution of its sports teaching system, it can be seen that its greatest splendor occurred at the beginning of the 21st century, when the International Volleyball Federation began a process of substantial changes in the form, content and regulation of the game, among which The following stand out: the use of four touches when the ball makes contact with the block, the flexibility of the regulations in the execution of the fundamentals of the game, the increase in the contact areas of the body with the ball, the appearance of the libero player to seek a balance between attack and defense,

The aforementioned changes gave a turn to the traditional conceptions of volleyball teaching, turning the athlete into an active subject of their own learning, which allowed the emergence and development of teaching programs that prioritize playing, rather than the isolated teaching of the sport techniques. From this perspective, it is important to assess the two fundamental ways of conceiving the teaching-learning process in sports games: the technical or traditional model and the tactical or integrated.

In the scientific literature there are a large number of works that have addressed the content of the models or paradigms of teaching sports games; as cited in Méndez (2017), Thorpe and Bunker (1982); Devis (1982); Matveev (1983); Kleschov, Tiurin and Furaev (1984); Parlebás (1986); Fiedler (1987); Zatsiorski (1988); Harre (1988); Ozolin (1989); Bayer (1992); Andux (1997); Sierul-lo (1998) and Navelo (2004), have been part of the authorship of said scientific works. The referred authors, when comparing both teaching perspectives, value from the objectives pursued, the positive and negative aspects of them, reaching the conclusion that the traditional model is more conducive to use when pursuing objectives focused on technical learning in sports games.

Griego (2016), in relation to the teaching models of sports games, states that:

... the first of them focuses on exercise progressions, both for assimilation and application, and on the development of fundamental sports techniques before tackling the tactical aspects and practicing the game in real situations (the learning of the skill before understanding of the game). The second is associated with the pedagogy of discovery and is based on the proposal of ludic motor experiences linked to the real context of the game from the first moment (p.21).

López (2005) as cited in Escobar (2021), stated that the integrated technical-tactical model:

... It is considered as an intermediate position between the models that defend the teaching of team sports starting with tactics and those that maintain the need to start with the so-called technical foundations. In this way, it responds to this double need for teaching to go from the specific to the general (from technique to tactics) and also from the general to the specific (from tactics to technique) in a complementary way (p. 19).

Guiscasho (2016) when referring to the models of teaching-learning of the technical foundations of Volleyball, in Basic General Education, stated that: "... it welcomes traditional teaching, as they are those activities, skills or techniques that are carried out from the different technical phases, making movement more efficient, spending less energy and obtaining better results" (p.45).

Macías (2019), considers that the teaching of the reception of the ball in adolescents, "... should be done through the game for the wealth and motivation that it generates, since in the game itself this skill is exercised, but, that it owes precede individualized technical teaching" (p.15). For Narvaiza (2019), when referring to the methods for teaching Volleyball, it embraces a "... traditional teaching focused on the technique, since it refers to explanatory, demonstrative and individual and group execution methods" (p. 10).

García (2020), supports his proposal of "methodological technical exercises for teaching the serve from below the front, in Volleyball athletes, in the traditional or technical teaching of technical foundations" (p.27). Flores (2017), is committed to a traditional or technical teaching, in his proposal of exercises to improve the reception of the school volleyball player, considering that "... individual technique should always be trained as

much as possible, and as simple as necessary; to eliminate individual errors: requirement-results". (p.18)

The theoretical analysis carried out in relation to the teaching models of sports games, in particular Volleyball, reaffirms the relevance of the traditional or technical model, in the teaching-learning process of Physical Education, when technical learning objectives are pursued, and therefore a game that conforms to the established rules. This makes it easier for students to take ownership, first, of the technical gesture and then of the group and team actions, as previous phases of the recreational-sports activities, which must participate as part of the curriculum.

Basic technical elements of Volleyball are considered, in the ages between 14 and 15 years, the positions and movements -linked to the exercises of other fundamentals-, the serves directed to the opposite field, the reception of the service from the playing areas towards the passer, the volley-pass overhead to different front areas of the field, front shot in zones 4, 3 and 2 -without and against blocking-, individual and double blocking -without and against shots- and the defense of the field from the different areas of the terrain. These technical elements in correspondence with age, will serve as a reference for the identification of the components of the technical test to be developed.

In relation to the psychological profile of adolescents in their second stage, between 13 and 16 years old, it is pertinent to approach the factors that positively affect and offer benefits with sports practice, and the aspects that can negatively affect the abandonment of said practice. For the Physical Education teacher, it is relevant to know that at this stage the young person self-reflects "... on himself and on the outside world, which leads to states of mistrust, moments of sadness, mood swings, contradictory attitudes and insolent expressions" (García, 2009, p.1). In this sense, the practice of volleyball and in particular the mastery of its technical fundamentals, offers the possibility of achieving aspirations, such as: being elegant, having aesthetic qualities, robustness, physical strength, sports skills and good looks; what has an impact on the adolescent's self-concept and self-esteem (García, 2009); becoming a motivating factor for competitive sports practice.

The research was proposed as an objective: to assess the impact of a sequence of methodological steps in the teaching of motor skills of Volleyball, in the 10th grade

Physical Education class of the Narciso Cerda Maldonado educational unit, supported by the traditional teaching model or coach of sports games.

METHODS

The research carried out responds to the quantitative paradigm, with a general experimental design, by using the pre-experiment as a fundamental form of verification of the hypothesis, in a group of 20 -20- 10th grade students, as an intentional non-probabilistic sample -12 of the male and 8 female-, from the student population of the Narciso Cerda Maldonado educational unit, in La Maná, Cotopaxy, Ecuador.

Pre-test and post-test were carried out to determine the correlation -positive or negative- between the variables: influence of the methodological steps in the teaching of the technical foundations of Volleyball –independent-, and learning in the subjects of the sample –dependent-, using the Kolmogorov-Smirnov statistical test.

The independent variable was applied in the contents corresponding to the block of sports practice, in thirty -30- frequencies of Physical Education classes, in 45 days of duration.

A documentary analysis was carried out to identify the relevance of the technical or traditional teaching model, with the requirements of the current Ecuadorian Physical Education Curriculum; and the measurement method to put into practice the pedagogical-technical test.

The theoretical methods used were the analytical-synthetic, the hypothetical-deductive and the functional-structural systemic, the latter to structure and connect the methodological steps in the teaching of the sports motor skills of Volleyball, based on the traditional or technical teaching model.

RESULTS

Results of the documentary analysis carried out on the Physical Education Curriculum, in force in Ecuador.

The objective of the analysis was to determine the relevance of the traditional or technical teaching model, with the intentions of the Physical Education Curriculum in force in the Republic of Ecuador. The indicators identified for the analysis were: curricular organization, principles of the development of the curriculum, curricular blocks and objectives of the curricular block of sports practices.

Regarding the curricular organization, Physical Education is considered a compulsory area of knowledge, to reach the exit profile in Basic General Education, with a frequency of five hours per week. This assertion values the role of the subject, in the comprehensive training of Ecuadorian adolescents and young people, and gives the teacher a high responsibility for the didactic preparation that implies achieving "greater degrees of flexibility and curricular openness to bring the proposal closer to the interests and needs of students" (Ministry of Education, 2016, p.9). The weekly frequency of classes established, enhances the levels of systematicity required by the process of training Volleyball skills, in the technical or traditional model, which constitutes a strength.

The principles of the development of the Physical Education Curriculum are based on the development of "skills with performance criteria that aim for students to mobilize and integrate the knowledge, skills and attitudes proposed in them in specific situations" (Ministry of Education, 2016, p.11). From this point of view, the traditional or technical model of volleyball teaching is ideal since the game actions require integration and decision making for motor responses, based on knowledge and behavioral values, which the rules impose on the student.

The Ecuadorian Physical Education Curriculum identifies four curricular blocks for the development of skills with performance levels, which respond to epistemological, didactic and pedagogical criteria related to Physical Activity. The blocks that give shape to this curricular design are: "ludic practices: games and playing, gymnastic practices, expressive-communicative body practices and sports practices" (Ministry of Education, 2016, p.50); those that present as transversal axes of the curriculum the construction of the corporal identity and the relations between corporal practices and health. The block of sports practices is the curricular framework conducive to proposing the technical contents of Volleyball, with the aim of achieving basic sports training.

The block of sports practices establishes that the objectives in Physical Education can be oriented, "from recreation among peers to the highest levels of performance" (Ministry of Education, 2016, p.53); This statement corresponds to technical training objectives for the sports participation of students.

The indicators analyzed allow us to conclude that there is an adequate alignment between the claims of the Physical Education Curriculum, in force in Ecuador, and the

conceptions on which the technical or traditional teaching model of Volleyball is based, which shows its relevance for the training process in the 10th grade of Higher Basic Education.

Teaching methodology of the basic technical foundations of volleyball in students of the 10th grade of higher basic education.

The methodological steps for teaching volleyball sports motor skills, which are presented below, are based - theoretically - on the technical or traditional model of teaching sports games.

1. Explanation, demonstration and illustration: it is carried out by the Physical Education teacher himself, where he has to verbally describe the technique he teaches in the following order: before contact with the ball, during contact with the ball and after contact with the ball, and demonstrate it in part, until it is done globally.
2. Execution of auxiliary preparatory exercises: aimed at developing the specific physical capacities of volleyball players. Examples: imitation of short distance volley with a medicine ball for arm strength, frog jumps for leg strength work, imitation of shot with small weights on the waist for the development of jumping ability, etc.
3. Execution of the auxiliary conducting exercises: aimed at strengthening the technical structure of the movement, it has an imitative nature and as a correction of errors. Example: imitation of the technique of volley without the ball all over the field.
4. Simple exercises: are those through which the technical foundations of the game are taught and exercised, in its first manifestation. They allow a general knowledge of the movement, have little connection with tactics, are carried out on and off the field of play. Introductory exercises are used for teaching. Examples: individual volley; volley to the ball thrown by the partner; volley in pairs; trios and quartets.
5. Invariable exercises: their purpose is still technical, aimed at developing and mastering the technical foundations of the game, they are carried out within the field of play individually and in groups, there are no active opponents. Standard type exercises are used. Examples: serve from the finish line to the right and left of the opponent's court; serve from the end line towards zone 1, 6 and 5 of the opposing field and serve from the end line towards the front zones etc.
6. Variable exercises: Their purpose is tactical and they are aimed at improving and consolidating the technical foundations of the game. Its execution presents great

difficulties. Its demands shape the competitive activity of volleyball. The player is the one who decides the motor solution to carry out before the complexity of the exercise. Modeled exercises are used. Examples: zone 4 spike against single or double blocking; receipt; skip to zone 4; auction against individual or double block and defense of the auction by zone 1, 6 and 5.

7. Competitive exercises (game): it manifests itself through the different types of games, the technical and tactical foundations of the game are competitively automated, all those exercises whose volume and intensity closely approximate the demands of the physical load and psychic competition. Examples: study game; homework games; control game and free play.

Description of the technical pedagogical test used

The player will carry out the technical test in three attempts, of which the Physical Education teacher, through the observation protocol, proceeds to record the possible technical errors that he has identified. Possible errors in which students repeat offenses are recorded.

Name and Surname: Date:			
Fundamentals.	Made mistakes	Y	Pts
<u>Take out</u> Right and left side after the teacher's signal.	He does not extend his arm when striking.		
	Throw the ball incorrectly.		
	Incoordination in flexion and extension movements.		
<u>Reception</u> To the sides and to the front without prior knowledge.	Incoordination in flexion and extension movements.		
	He catches outside the contact area of the forearms.		
	Bend your arms during contact.		
<u>Happens</u> To the front on a throw to the sides and to the front.	Bad placement under the ball.		
	Incoordination of flexion and extension movements.		
	Bad placement of the hands on the ball.		

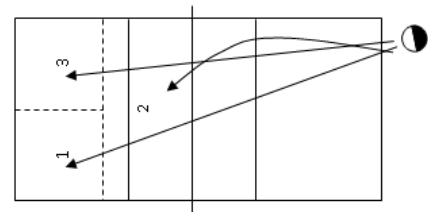
General evaluation of technical foundations

- Serve: 15 points
- Reception: 20 points
- Pass: 20 points

Individual Serve evaluation

- If do not make mistakes: 15 points
- If make a mistake: 10.5 points
- If make two mistakes: 7.5 points
- If make the three mistakes: 0 points

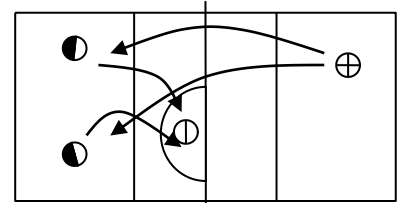
For the Serve



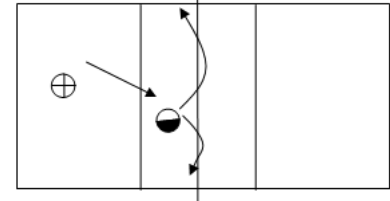
Individual evaluation of the reception and the pass

- If do not make mistakes: 20 points
- If make a mistake: 14 points
- If make two mistakes: 10 points
- If make the three mistakes: 0 points

For the reception



For the pass



DISCUSSION

The table that we present below shows us the results of the application of the technical test, in the pre and post test.

No.	PRE-TEST			POST-TEST		
	Serve	Reception	Pass	Serve	Reception	Pass
1	7.5	10	10	10.5	14	20
2	0	10	10	10.5	20	20
3	7.5	10	10	10.5	20	20
4	7.5	0	10	10.5	14	20
5	7.5	0	10	10.5	14	20
6	0	10	10	10.5	20	20
7	0	10	0	10.5	20	14
8	7.5	10	0	15	20	14
9	7.5	0	0	15	14	14
10	7.5	10	10	15	20	20
11	0	10	10	10.5	20	20
12	0	10	10	10.5	20	20
13	0	10	10	10.5	14	20
14	7.5	14	0	15	20	14
15	7.5	10	0	15	14	14
16	0	10	0	10.5	14	14
17	7.5	0	10	15	14	20
18	0	10	0	10.5	20	14
19	7.5	14	0	15	20	14
20	7.5	14	10	15	20	20
Max	7.5	14	10	15	20	20
Min	0	0	0	10.5	14	14
Average	4.5	8.6	6	15	17.6	17.6

To determine the existence of significant differences between the pre and post test, the Kolmogorov-Smirnov test was applied. First, a test of normality of the serve was carried out, for its two measurements. It could be seen from the data processing that there is no significant difference in this measured variable, since the significance is higher than 0.025, which allows us to affirm that it is normally distributed (see table # 2). Applying a mean test for related samples, a value less than 0.025 is obtained in this variable, which

implies that the results of the second measurement are significantly higher than the first. All 10th graders improved their serve results. (See table 3 and 4)

Table # 2. One-Sample Kolmogorov-Smirnov Test

		S1	S2
N		20	20
Normal Parameters	Mean	4,50000	15.3500
	Std. Deviation	5,60075	6.98325
Most Extreme	Absolute	, 400	, 307
	Positive	, 400	, 307
	Negative	-, 238	-, 167
Kolmogorov-Smirnov Z		1,789	1,371
Asymp. Sig. (2-tailed)		, 03	.047

a Test distribution is Normal. b Calculated from data.

Table # 3. T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	S1	4.50000	20	5.60075	1.25237
	S2	15.3500	20	6.98325	1.56150

Table # 4. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error	95% Confidence Interval of the				
					Lower	Upper			
Pair 1	S1 -	-	2.70039	.60383	-5.6138	-3.0862	-7.204	19	.000

Legend: S1. Take out pre test. S2. Post-test serve

During the application of the Kolmogorov-Smirnov test, in the service reception variable, it was found that there is no significant difference in this measured variable, since the significance is higher than 0.025 - when first performing a normality test of this variable, in its first and second measurement-; It was observed that it is normally distributed (see table # 5). When applying the mean test for related samples, a value less than 0.025 is obtained, which means that the results of the second measurement are significantly higher than the first. (See table # 6 and 7)

Table # 5. One-Sample Kolmogorov-Smirnov Test

		RS1	RS2
N		20	20
Normal Parameters (a,	Mean	8,63500	17.6000
	Std. Deviation	2.15883	2,24781
Most Extreme	Absolute	, 164	, 200
	Positive	, 164	, 178
	Negative	-, 136	-, 200
Kolmogorov-Smirnov Z		, 735	, 894

Asymp. Sig. (2-tailed)	, 652	, 400
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a Test distribution is Normal. b Calculated from data.

Table # 6. T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	RS1	8.6500	20	2.15883	, 48273
	RS2	17.6000	20	2,24781	, 50262

Table # 7. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std.	Std.	95% Confidence				
					Lower	Upper			
Pair 1	RS1 -	-9.0500	1.08942	.24360	-6.1599	-5.1401	-23.194	19	.000

Legend: RS1. Reception of the pre-test service. RS2. Post-test serve reception.

Finally, when applying the Kolmogorov-Smirnov test, in the passing technique, it was obtained during the normality test in its first and second measurement, that there is no significant difference in this measured variable, since the significance is greater than 0.025, so it is stated that it is normally distributed (see table # 8). In the mean test for related samples, a value less than 0.025 is obtained, so the results of the second measurement are significantly higher than the first. (See table # 9 and 10)

Table # 8. One-Sample Kolmogorov-Smirnov Test

		P1	P2
N		20	20
Normal Parameters	Mean	6.0000	17.6000
	Std. Deviation	2.45164	2.48998
Most Extreme	Absolute	, 149	, 179
	Positive	, 149	, 166
	Negative	-, 148	-, 179
Kolmogorov-Smirnov Z		, 665	, 802
Asymp. Sig. (2-tailed)		, 768	, 541

to. Test distribution is Normal. B. Calculated from data.

Table # 9. TT

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	P1	6.0000	20	2.45164	, 54820
	P2	17.6000	20	2.48998	, 55678

Table # 10. Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)
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		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	P1	-10,400	,69585	,15560	-6,1257	-5,4743	-37,276	19	,000

Legend: P1. Pass pre test. P2. Post-test pass

The theoretical systematization carried out on the models or paradigms of teaching sports games shows a tendency for Physical Education teachers and sports coaches to use the traditional model, provided that the objectives to be achieved are related to greater effectiveness in technical execution. of sports motor skills.

In the documentary analysis carried out on the Physical Education Curriculum in force in Ecuador, it was possible to appreciate that the didactic requirements established for the development of the program are in harmony with the characteristics of the traditional or technical model of teaching sports games, which shows the belonging for your practical application. The results of the pre-test, as a previous examination or diagnosis, revealed the deficiencies in the technical domain of the basic fundamentals of the game of Volleyball: serve, reception of the serve and pass.

The methodology of teaching the basic technical elements of Volleyball, applied in the Physical Education class in 10th grade, of the Narciso educational unit Cerda Maldonado, in La Maná, Cotopaxy, Ecuador, supported by the traditional model of teaching sports games, demonstrated its effectiveness in learning the serve, reception of the serve and pass, as there is a significant difference between the results of the post test and the pre-test, during 45 days of application in the block of sports practices of the Physical Education Curriculum.

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