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*Translated from the original in spanish*

*Original article*

## *Evaluation procedure for the initial phase of the basketball free throw*

*Procedimiento de evaluación de la fase inicial del tiro libre del baloncesto*

*Procedimento de avaliação da fase inicial do lance livre no basquete*

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### **ABSTRACT**

The procedure presented was developed with the objective of determining indicators for the evaluation of the initial phase of the basketball free throw, in the 9-10-year-old category. In its preparation, the low percentages of effectiveness in both attempted and scored were taken into account, as well as the deficiencies in execution obtained in the preliminary study, carried out on 120 children from the western zone, with a mastery of only 25 % of the biomechanical aspects to be achieved in the teaching process; this constituted one of the main motivations for the preparation of the evaluation procedure. The documentary



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analysis, observation through structured guides and videography techniques, as well as the interview, made it possible to detect insufficiencies in the evaluation of the execution of the free throw in sports initiation. In the work, the assessment was carried out, through the criteria of specialists and the criteria of users, and leaves open a space to expand actions of a methodological order and of a scientific, technical, physiological, theoretical and psychological nature that serve the development of teachers and coaches. base.

**Keywords:** basketball, evaluation, initial phase, procedure, free throw.

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### **RESUMEN**

El procedimiento que se presenta se elaboró con el objetivo de determinar indicadores para la evaluación de la fase inicial del tiro libre del baloncesto, en la categoría 9-10 años. En la confección del mismo, se tuvieron en cuenta los bajos porcentajes de efectividad tanto en intentados y anotados, como las deficiencias en la ejecución obtenidas en el estudio preliminar, realizado a 120 niños de la zona occidental, con un dominio de solo el 25 % de los aspectos biomecánicos a alcanzar, en el proceso de enseñanza; ello constituyó una de las principales motivaciones para la confección del procedimiento evaluativo. El análisis documental, la observación a través de guías estructuradas y las técnicas de videografía, así como la entrevista, permitieron detectar las insuficiencias en la evaluación de la ejecución del tiro libre en la iniciación deportiva. En el trabajo, se realizó la valoración, mediante criterio de especialistas y criterio de usuarios, y deja abierto un espacio para ampliar acciones de orden metodológico y de carácter científico, técnico, fisiológico, teórico y psicológico que sirvan al desarrollo de los profesores y entrenadores de base.

**Palabras clave:** baloncesto, evaluación, fase inicial, procedimiento, tiro libre.

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## RESUMO

O procedimento apresentado foi elaborado com o objetivo de determinar indicadores para a avaliação da fase inicial do lance livre no basquetebol, na categoria de 9 a 10 anos de idade. Em sua elaboração, foram levados em conta os baixos percentuais de eficácia tanto nos arremessos tentados como nos arremessos marcados, bem como as deficiências na execução obtidas no estudo preliminar, realizado em 120 crianças da zona oeste, com um domínio de apenas 25% dos aspectos biomecânicos a serem alcançados no processo de ensino; isso constituiu uma das principais motivações para a elaboração do procedimento de avaliação. A análise documental, a observação por meio de guias estruturados e técnicas de videografia, bem como a entrevista, permitiram detectar as insuficiências na avaliação da execução do lance livre na iniciação esportiva. No trabalho, a avaliação foi realizada por meio de critérios de especialistas e critérios de usuários, e deixa um espaço aberto para ampliar ações de ordem metodológica e de natureza científica, técnica, fisiológica, teórica e psicológica que sirvam ao desenvolvimento de professores e treinadores de base.

**Palavras-chave:** basquetebol, avaliação, fase inicial, procedimento, lance livre.

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## INTRODUCTION

In the free throw teaching process, the initial phase is the first objective to overcome, it is where learning the motor habit begins. The Comprehensive Athlete Preparation Programs (PIPD) between the years 2008 and 2020 lack a model or technological tool available that integrate an adequate procedure that makes it possible to evaluate the technical execution process of the free throw in the 9-10-year category. The qualitative evaluation of the initial phase of the foundation is carried out only by the pedagogical observation method with non-precise indicators established by (Monteagudo, *et al.*, 2017) that leave the teacher's criteria open.

The preliminary diagnosis of the research during the years 2018 and 2019 corroborates the results of previous studies carried out by Hernández *et al.* (2017) in teams from nine



provinces of the country. The need for a consensus between experts, researchers, trainers and teachers is expressed once again in relation to the indicators to evaluate its effectiveness.

The research carried out by Díaz & Arias (2020, 2022) projects the importance of control and evaluation of the free throw from the beginning. The criteria expressed in the studies with the use of Information and Communication Techniques (ICT) raise the need to gradually change what is established in the national governing documents due to the negative implication they have in the development of the basic motor skills of basketball. at early ages (Veitía *et al.*, 2023) and in self-control in high performance (Suarez & Sánchez, 2020).

The planned results can be obtained with the necessary motivational climate expressed by González *et al.* (2019) who advocate healthy group coexistence and its influence on activities related to the development of motor habits.

The behavior of the free throw evaluation process carried out by sports teachers in the teaching-learning processes is still deficient, it does not allow laying the foundations that define the quality of the evaluation through a pedagogical tool that facilitates continuity in the process (Hernández, 2021).

The methodological design was developed taking into account the importance of the free throw in Basketball, the need for its correct teaching in the study category, the theoretical methodological mastery that teachers must have in the teaching-learning process of the study foundation. , according to the results of the research, the use of new technologies, as well as the mastery that teachers must possess for the evaluation of the initial phase of the free throw in correspondence with the characteristics of current Basketball, the objectives to be overcome, the forms evaluation and regulations in force for category 9 10.

The methodological procedure that is designed aims to establish a system of indicators for the evaluation of the initial phase of free throw in the 9 10-year category. The instrument corresponds to the results of the first three lines of research of the Institutional Project "Free Throw for All" (PROTLT) of the "Manuel Fajardo" University of Physical Culture Sciences (UCCFD).



Based on a model to evaluate technical execution, guidelines were established for the different projections of the assessment of the technical element, a different mode of action was observed by teachers in the conceptual, procedural and attitudinal dimension, giving it greater use. to the tools acquired during the research process.

The indicators with biomechanical aspects and other dimensions that relate the cognitive processes expressed by Hernández *et al.* (2021), Núñez *et al.* (2021), Ponce (2018) and Veitía *et al.* (2023) are applied and generalized with positive results with advances in improvement of up to 25% in execution

The objective of this work is to determine the indicators for the evaluation of the initial phase of the free throw in the 9-10 basketball category.

To achieve this purpose, sources of great importance for the scientific study procedure were consulted. These sources are the following:

- Analysis of the concepts, characteristics, dimensions aimed at efficiently evaluating the technical execution, adjusted to the current context, which give rise to redesigns in indicators taking into account the technical aspects supported by the significant learning of Biomechanics, (Andrade, 2020).
- Evaluation scales proposed by Hernández (2021) for the PROTLT, taking into account the needs of teachers and practitioners.
- Selection of the group of specialists using the criteria considered by Fleitas *et al.* (2013) regarding the qualities, competencies, effectiveness of professional activity.
- Criteria of (Valledor, 2010) to verify the validity of the instrument referring to the theoretical conception and effectiveness of its application through the implementation of the evaluation process of the initial phase of the free throw.
- Use of the Iadov technique proposed by (López & González, 2002), which is nothing more than a questionnaire to evaluate the state of satisfaction of the subjects involved.



- The procedure of (González. & Bautista, 2018) to carry out the evaluation of practitioners.

## MATERIALS AND METHODS

The study takes place in the area of Physical Culture, in the sphere of sports training, it refers to quantitative research with the use of mathematical and statistical models. The methodological procedure belongs to a quantitative experimental design in which theoretical and empirical methods and the corresponding techniques were used for the validation actions of the procedure belonging to the 4th stage of the research to evaluate the initial phase of the free throw. in the 9 10-year category, inserted in Line number 1 of the knowledge area of the UCCFD Doctoral Sports program called "Training and preparation of Cuban athletes and their reserve" where the main activities are developed through of the project for the Comprehensive Preparation of the Cuban Sports Reserve (PIRDC).

The process yields an instrument for observational analysis adjusted to the needs and means available, with items in accordance with the variables used in a procedure supported by technical indicators and biomechanical aspects based on three structured observation guides with different evaluative criteria for each one of the body segments studied with the aim of perfecting the evaluation in the initiation category 9 10 years:

- Guide No.1 of 22 general technical indicators.
- Guide No.2 Specific technical indicators of the initial phase and some biomechanical aspects to consider.
- Guide No.3 Biomechanical indicators for the evaluation of the initial phase.
- The indicator system has been supported by videography techniques. The measurement was carried out using the Human Movement Analysis (AMH in Spanish) methodology and to implement it the Kinovea A (0.8.15) computer program was used.





The specialist criteria method is used in the study to verify the feasibility of the procedure and evaluate the practical effectiveness of its methodology under a dialectical - materialist conception with a qualitative and quantitative scientific approach. Its objective in the research is to obtain reliable information, opinions that confirm the validity of the criteria and assessment of the theoretical and methodological argumentation of the evaluation procedure, its systemic, structural relationship, functions and effectiveness in practical application.

The direct beneficiary users of the proposal evaluated its impact. This reference criterion is assumed to obtain the opinions of the personnel responsible for such results. For this purpose, the elements "that are based on the relationships established within three closed questions that are interspersed within a questionnaire whose relationship the subject is unaware of" are used, from a questionnaire modified by the authors. The questions are related through VA Iadov's logical framework.

The user criteria method was used in a sample of 15 sports teachers with experiences in social practice to know the level of satisfaction provided by the procedure. To support this result, a survey was used through the Iadov technique.

During the study, mathematical statistical methods such as descriptive statistics and their graphic representations were used. The systemic method was used as a methodological tool to develop the evaluative procedure aimed at modeling the determination of the design, its structural components, stages as shown in (Figure 1), phases, actions, as well as the relationships between them with a hierarchical order of each component taking into account its functionality in each of the stages and the characteristics where the research is developed.





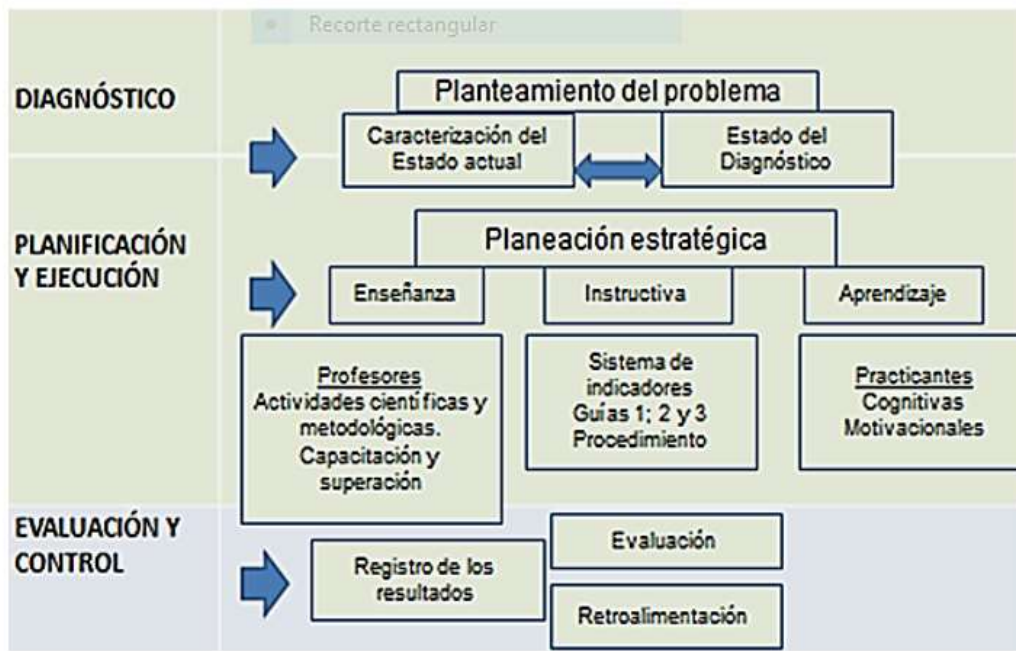


Fig. - 1. - Graphic representation of the procedure

In the proposed evaluative procedure, some design techniques and tools, sequences and actions organized together by a technological logic are explained to analyze the execution of the free throw in players aged 9 10 years, where emphasis is placed on their initial phase of the game. motion. In the procedure, files collected during the research process can be consulted, which provide the output information or initial result, where it can be compared what was done before and what will be done later in certain actions that make up the procedure.

Based on what was expressed by the author, with the objective of systematizing his criteria, the research presents an approach to the procedure, for the evaluation of the initial phase of free throw, which consists of several essential components such as the purposes, the area where each action is carried out, the stages of the training program where they will be used, the process of which they will be part, position of the person who executes, information and sources that are required to execute it, among others, all with the objective of improving the evaluation process of the initial phase of the free throw.



The population used for the initial diagnosis coincides with the sample and was made up of 12 (main) sports teachers from the west of the country, graduates in Physical Culture, represented in (Table 1) by eight men (67 %) and four women (33 %), seven male team teachers and five female team teachers with an average age of 33 years and ten years of experience in mini basketball and eight years in the school category. 60 % of the teachers have already been working with youth teams and only 41 % have been part of the technical group in the senior categories.

**Table 1. - Characterization of the population selected for the study**

No.	Teams Men M. Women F	Coach		Experience in the category			
		Sex - Age	Level	Mini	School	Youth	Greater
1	P. Rio. F	F-38	Lic.	4	2	-	-
2	P. Rio. M	M-20	Lic.	6	1	6	-
3	Mayabeque F	M-32	Lic.	8	6	-	-
4	Mayabeque M	M-28	Lic.	9	12	5	8
5	Artemisa F	M-45	Lic.	eleven	12	3	4
6	Artemisa M	M-30	Lic.	4	4	8	6
7	Matanzas M	F-31	Lic.	9	12	8	-
8	Havana F	F-43	Lic.	19	12	-	-
9	Havana M	M-47	Lic.	32	15	-	-
10	Cerro F	F-27	Lic.	7	-	-	-
eleven	Cerro M	M-30	Lic.	10	6	'	--
12	Santa Cruz Cross	M-26	Lic.	8	eleven	8	

*Note: Symbology: F (Female), M (Male) and Lic. (Graduate)*

100% of the selected sample has years of experience in the initiation category, which constitutes an important factor in the research process as there is maturity in the process it directs, which enables greater commitment to solve the problem being addressed. The results of the proposal are generalized in the selected sample and perfected in 2022 through an experimental group of coaches from four teams in the capital of both sexes, where eight teachers from the base are an active part of that process. Currently, 41 professors from Havana are preparing, investigating, diagnosing and proposing methodological actions, assisted by members of projects related to research.

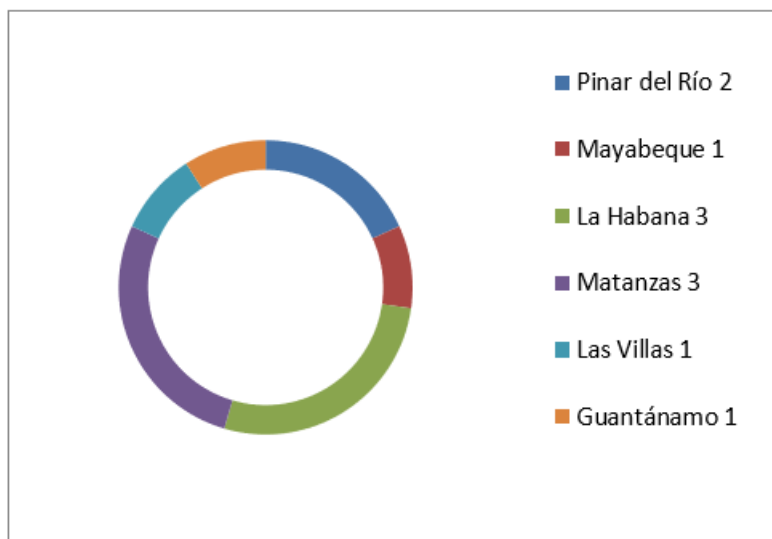


## RESULTS AND DISCUSSION

In order to make an evaluative judgment of the procedure, it is submitted to the criteria of specialists to express the estimates, through the conclusive qualifications expressed on the applicability, viability and effectiveness of the possible solution, and offer suggestions to improve them, based on aspects essentials such as:

- Theoretical methodological argumentation of the evaluation procedure.
- Structural systemic relations of the conception of the procedure.
- Structure and functions of the methodology of the evaluation procedure.
- Effectiveness of the practical application of the evaluative procedure.

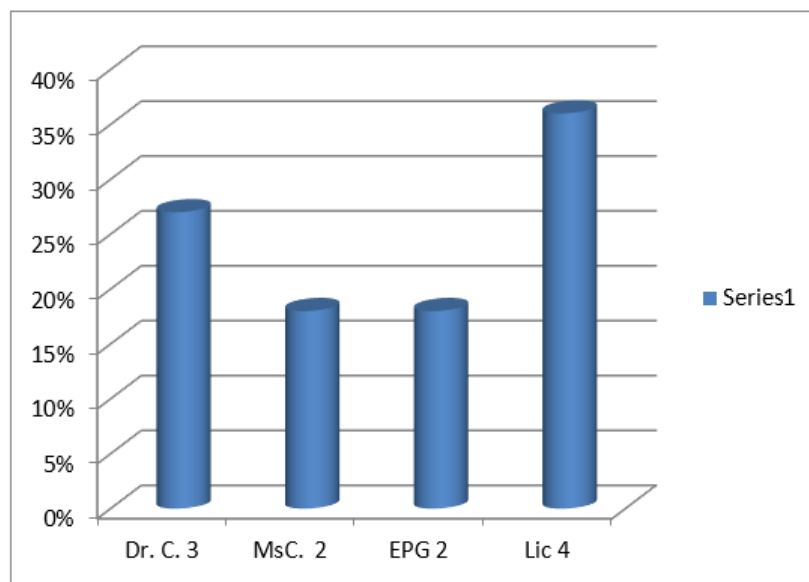
A sample of 11 national specialists was selected, including sports glories; 100 % have degrees in Physical Culture and seven, 63 %, have a scientific category or scientific degree. A total of nine are from the west of the country, which represents 81 %, one is from the center and one is from the eastern region (Figure 2).



*Fig. 2. - Formation of the group of specialists from different provinces of the country*



The selected group is characterized by its diversity in the academic and scientific field; the majority (90%) are sports glories and relevant figures; in addition, they serve as teachers and postgraduate specialists, with national and international results, they have directed and worked in the initiation process, in the technological demands of basketball, as well as in practical experience as former athletes and managers (73 %) in the area of basketball and physical culture, eleven of them with national results (100%) and five with international results in the discipline, as shown in Figure 3.



*Fig. 3. - Significant characteristics of the group of specialists*

To validate the procedure, a questionnaire was used with the explanation of the indicators. The instrument to assess and recommend was a guide with aspects on the relevance of the indicators, affordability, qualitative and quantitative evaluation, as well as its evaluation scale and the motivational impact that the procedure may generate.

*The scale for evaluating each indicator from 1-5 is established as follows:*

5 = TMA - Strongly agree (totally agree with what is proposed).

4 = DA - Agree (Agree, but considers that there are elements that can be improved).

3 = N - Neutral (Is indifferent to the aspects raised).

2 = ED - Disagree (Consider that you do not approve the proposed indicators).



1 =TA - Totally disagree (Does not approve and considers that these indicators should not be).

The argumentation criterion is expressed as follows: 1-2 (low), 3 (Medium) and 4-5 (High). The criteria that are in the neutral, disagree and totally agree category require the necessary argumentation. Regarding the general evaluation about the "methodological requirements and satisfaction," nine of the specialists representing 81% agreed with the evaluation in complete agreement, which corroborates the result of the proposal for its practical application in the training context. On the other hand, two of the respondents agree, the argumentation criteria are evaluated highly as being between 4 and 5 points (4.6) as reflected in table 2. The feasibility of the conception is demonstrated and the effectiveness of the procedure, through the analysis of the results of the specialist criterion method (Table 2).

*Table 2. - Ratings of the results of the specialist criterion*

Subjects	Item scoring					Evaluation
	1	2	3	4	total	
<b>1</b>	5	4	5	5	19	TDA
<b>2</b>	5	5	4	5	19	TSA
<b>3</b>	4	5	5	4	18	TDA
<b>4</b>	5	5	5	5	20	TDA
<b>5</b>	4	5	4	4	17	DA
<b>6</b>	5	5	4	4	18	TDA
<b>7</b>	5	4	5	5	19	TDA
<b>8</b>	5	5	5	5	20	TDA
<b>9</b>	5	5	5	5	20	TDA
<b>10</b>	4	5	4	4	17	DA
<b>11</b>	5	5	5	5	20	TDA
<b>Total</b>	4.7	4.8	4.6	4.6	4.6	HIGH

*Assessment of the satisfaction of beneficiary users (sports coaches and teachers in the 9-10-year-old category)*

In the satisfaction study, the Iadov technique was used, an indirect route (López and González, 2002) through the application of a questionnaire modified by the authors as shown in Table 3.



**Table 3.** V.A. Iadov `s logical table with reformulated questions for the study

3 Do you like the structure of the procedure to evaluate the initial phase of the free throw?	2 Do you consider that the proposed procedure is functional and appropriate for the 9 - 10-year-old basketball category?											
	No			I don't know			Yeah					
5 Do you feel satisfied with the Procedure designed for the evaluation of the initial phase of the Free Throw?	5 Do you feel satisfied with the Procedure designed for the evaluation of the initial phase of the Free Throw?											
	Yeah	I don't know	No	Yeah	I don't know	No	Yeah	I don't know	No	Yeah	I don't know	No
I like it a lot	1	2	6	2	2	6	6	6	6	6	6	6
I do not like it that much	2	2	3	2	3	3	6	3	3	3	3	6
I do not care	3	3	3	3	3	3	3	3	3	3	3	3
I dislike it more than I like it	6	3	6	3	4	4	3	4	3	4	4	4
I do not like	6	6	6	6	4	4	6	4	4	4	5	5
I don't know what to say	2	3	6	3	3	3	6	3	6	3	4	4

The number resulting from the interrelation of the three questions indicates the position of each subject on the satisfaction scale (Otero & Hernández, 2022). The estimate of the group satisfaction index (GSI) was obtained through the different levels of satisfaction expressed on a numerical scale that ranges between 1 and -1. The satisfaction scale has six levels:

1. Maximum satisfaction (+1)
2. More satisfied than dissatisfied (0.5)
3. Undefined and contradictory (0)
4. More dissatisfied than satisfied (-0.5)
5. Maximum dissatisfaction (-1).

Fifteen teacher evaluators were selected to determine the degree of satisfaction through user criteria. The selection was intentional and direct. They were considered the most accessible and at the same time able to provide the greatest amount of information, based on the following requirements:

- Be teachers who in their functions serve as evaluators in the processes of recruiting and selecting mini basketball talents.



- Be teachers who have participated during the implementation of the procedure in workshops, conferences, seminars, programs for the acquisition of an evaluative culture in the period between the years (2018-2022).
- Be teachers or students who have participated directly or indirectly in the research carried out during the practical application of the procedure.
- Possess willingness to participate in research.

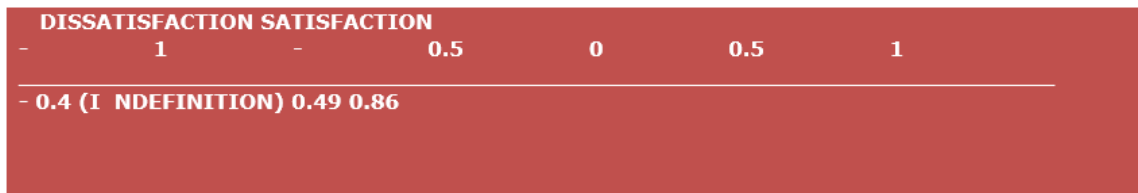
Once the group was selected, the responses to the closed questions of the questionnaire were evaluated. The formula established for said procedure was taken into account, where A, B, C, D and E represent the number of subjects with individual index. and N represents the total number of subjects in the group Equation 1:

$$ISG = A (+1) + B (0.5) + C (0) + D (-0.5) + E (-1)/N (1)$$

The formula is applied to the results of the interrelation of the questions in order to obtain the indicated result Equation 2:

$$ISG = 13 (+1) + 2 (0.5) + 0 (0) + 0(-0.5) + 0 (-1)/15 = 0.866 (2)$$

The group index obtained from the ISG instrument reflected in (Figure 4) is 0.866, which represents a positive index value, highlighting the satisfaction and recognition of the proposed procedure to evaluate the initial phase of the free throw.



**Fig. 4.** - Group Satisfaction Index of the Procedure proposal

*Note:* Location index with the rating scale.





The answers to the open questions had a good scope regarding the importance of the procedure. Regarding practical application, eight of those surveyed, 53 %, highlight the importance and consider it as a feedback process between everyone (practitioners, teachers and trainers), with an effective system that supports other related research. 33% raise the same importance and favor the RH-JP guide as the ideal instrument within the procedure. Only two people, 14 %, express the importance, but warn of the time factor necessary in the teaching process. Those surveyed consider that the view of the teaching process is correct.

In the closed questions, 13 people responded with a maximum satisfaction rate, 86%, and 14% identified themselves with a rate of more satisfied than satisfied, which highlights the positive aspect of the proposal. On the other hand, 12 of those interviewed (80%) attach great importance to the application of the procedure for the evaluation and control of HMD, from an early age due to the positive impact it has on higher categories.

Triangulation is carried out between the results of the diagnosis, the methods, the criteria of specialists and the initial pedagogical test, to evaluate the effectiveness of the procedure; The methodological procedure is the verification of the information obtained to reach consensus, with the purpose of qualitatively and quantitatively contrasting the results and corroborating their effectiveness, through the convergence of evidence from the selected indicators.

The different positions enrich the contents of the procedure and greater objectivity is achieved in the results of the research that guarantee the impact on professionals and compensate for the lack of pedagogical instruments for the evaluation of the initial phase of the free throw that allows evaluating the trajectory of the practitioner up to the highest levels.

The results of the methodological triangulation are consistent, the technique contributes to raising the objectivity of the data analysis, they confirm the need for the proposed methodological procedure to improve the evaluation of the technical execution of the free throw, at an early age and to provide true follow-up to the basic technical deficiencies and potentialities from the motor skill under study, both in training classes and in competitive



activity, with the desire for continuous improvement in technical preparation as the main objective in the 9-10 years category.

The process provides an instrument for observational analysis adjusted to the needs of the teaching process, with means within reach and with items in accordance with the variables used. It is a procedure supported by technical indicators and biomechanical aspects, based on three structured observation guides, with different evaluation criteria for each of the body segments studied, with the aim of perfecting the evaluation in the initiation category 9-10 years old and responding to the redesign of the program developed by Monteagudo *et al.* (2017).

Users rate with a high degree of satisfaction the content and its applicability in daily practice, the importance, feasibility, timeliness and the need to have, for the first time in the sport of basketball, a well-structured technical and methodological document with a scientific basis that contributes to improving the teaching-learning of free throw in the ages investigated as a system for the entire country, from the training of the professional of the Bachelor's Degree in Physical Culture and Sports.





The procedure continues to be socialized, through the demands of the UCCFD professional training management and as topics in optional subjects to instruct participants in current trends on HMD evaluation procedures, this benefits their improvement.

The topics are adaptable to the needs of the students, to the program for the evaluation of sports motor skills in the teaching-learning process and responds to the lines of the Sports Reserve Project, in the improvement of evaluation and control systems of the preparation of the athlete that today not only the effectiveness between attempted and scored proposed by Cevallos (2020) predominates, but also how to evaluate and what, as well as the indicators to determine the continuous behavior and extrapolated to other basketball techniques such as those designed by Piedra *et al.* (2022).

The assessment of the procedure is carried out at all stages of the process, taking into account the established variables, dimensions and indicators that are reflected in (Figure 5) as well as the appropriate methods and techniques to comply with the two fundamental



objectives set by Muñoz & Bisquerra (2013) aimed at the assessment of the training received and the evaluation of the effectiveness of each of the indicators or evaluative tasks and of each of the programs designed in the Project, with the different resources within reach and in accordance with what was stated by Ramírez & Auris (2021) about the correct use of measurement instruments that allow the initial diagnosis to advance to higher levels.

	<b>Variable Independiente</b>	<b>Dimensión</b>	<b>Indicadores</b>	<b>Métodos y Técnicas</b>
Evaluación del procedimiento  Estadio pedagógico	Procedimiento de evaluación Variable Dependiente La evaluación de la fase inicial del tiro libre.	Conceptual 	-Proceso de evaluación técnica en el Baloncesto. -Enfoque cognitivo -Tratamiento metodológico -Etapas de elaboración del procedimiento.	Análisis documental Encuesta Entrevista Observación Triangulación Metodológica Modelación Enfoque sistémico Esquema de postura Videografía
		Procedimental 	-Orientación del proceso. -Aplicabilidad -Estado del control y evaluación.	
		Actitudinal 	-Aplicación del procedimiento -Desarrollo de habilidades -Resultados.	

*Fig. 5. - Dimensions and indicators for the evaluation of the initial phase of the free throw*

The evaluation of the workshops of the project students and basketball teachers from the base who receive academic or scientific training is also added, from the proactive phase of the Project, in the Master of Sports Training for High Performance (4), the Works Diploma for the completion of studies (5), as well as Professional Practice (2).

## CONCLUSIONS

The study and analysis of the various national and international bibliographic sources provided better precision of the various concepts and points of view for the assessment of the technical elements, and evaluative control was one of the main premises of the study for the improvement of the analysis. and evaluation.



The results of the assessment of specialists and the criteria of users that contribute to the improvement of the methodology for the proposed procedure are presented, through a system of indicators for the evaluation of the initial phase of the free throw and the evaluation method. applied to the selected sample and the control group.

The topic addressed has made it possible for teachers and coaches of the minor categories in the west of the country to pay greater attention to the indicators proposed for the analysis of execution and not to the final result and research has increased in the period, with different studies carried out. at the "Manuel Fajardo" University of Physical Culture Sciences.

#### *Gratitude*

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The authors declare not to have any interest conflicts.

***Authors' contribution:***

The authors have participated in the writing of the work and analysis of the documents.



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