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## **Indicators for the evaluation of athletes' performance in international sports combat tournaments**

### **Indicadores para la evaluación del desempeño de los atletas en eventos deportivos internacionales de combate**

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#### **ABSTRACT**

The need for indicators that show the performance of international sports events is a problem that requires permanent solutions, especially in those countries where the sports system is based on government budget. This paper presents a group of indicators that allow the evaluation of performance in combat sports. Specialized literature on the subject was consulted and the programs of activities of the national sports associations of the disciplines of boxing, fencing, judo, karate do, associated wrestling and taekwondo from 2011 to 2015 were reviewed. This compilation facilitated the design of proposed indicators to evaluate the performance of mexican combat sports athletes in international events, recorded in official programs and documents. These indicators have served as a reference for statesmen and sociologists who have researched on this topic.

**Keywords:** international sport events; performance indicators; combat sports.

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#### **RESUMEN**

La necesidad de contar con indicadores, que señalen el desempeño de los eventos deportivos internacionales, es un problema que requiere soluciones permanentes, sobre todo en aquellos países donde el sistema deportivo está sustentado en presupuesto gubernamental. En este trabajo, se presenta un grupo de indicadores que permiten la evaluación del desempeño en deportes de combate. Se consultó literatura especializada en el tema y se revisaron los programas de actividades de las asociaciones deportivas nacionales de las disciplinas de boxeo, esgrima, judo, karate do, luchas asociadas y taekwondo, del año 2011 hasta el 2015. Esta compilación facilitó el diseño de indicadores que se proponen para evaluar el desempeño de los atletas de deportes de combate mexicanos en eventos internacionales, registrado en programas y documentos oficiales. Estos indicadores han servido de referencia para estadistas y sociólogos que han investigado en este tema.

**Palabras clave:** eventos deportivos internacionales; indicadores del desempeño; deportes de combate.

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## INTRODUCTION

The General Law of Sport in Mexico, Chamber of Deputies of the H. Congress of the Union (2014), states as attribution of CONADE: National Commission of Physical Culture and Sport (Mexican Governing Body in matters of sport) in its Article 29 Fraction XXVI. Promote and increase with existing budget provisions, funds and trusts, whether public or private, that in matters of Physical Culture and Sport are constituted for the purpose of organizing the participation of the social and private sectors, in order to contribute to the country's sports development.

On the other hand, the same law states in article 51: "National Sports Associations, duly recognized in terms of this law, in addition to their own attributions, exercise, by delegation, public functions of an administrative nature; in this case, they act as collaborating agents of the Federal Government, so that such action would be considered of public utility. In addition to the activities of government, administration, management, organization and regulation of the specialties that correspond to each of its sports disciplines, they exercise, under the coordination of CONADE, public functions of an administrative nature.

In view of the foregoing, CONADE must provide economic resources to National Sports Associations for the promotion of competitive sport. A part of these resources is allocated to cover the preparation of national teams for the Olympic Cycle, Central American and Caribbean Games, Pan American Games, Olympic Games and World Championships.

Every year, during the months of January and February, meetings are held with the presidents of the National Sports Associations and their technical directors to discuss the budget, depending on the program of activities they present; in these meetings, the events are reviewed, the economic amounts are adjusted with a methodological objective and the budget availability is appealed for.

Over time in the field of resource management, the way of measuring to control the impacts on the development of programs, within organizations, is a necessary aspect for continuous improvement of management processes. Currently they are a mechanism to evaluate the performance of the execution of sports programs.

An indicator is an observable qualitative or quantitative expression that allows describing characteristics, behaviors or phenomena of reality through the evolution of a variable or the establishment of a relationship between variables, which, compared with previous periods or against a goal or commitment, allows evaluating performance and its evolution over time. Public Function Administrative Department. DAPF, (2012).

Performance indicators are instruments that provide quantitative information on the development and achievements of an institution, program, activity or project in favor of the population or object of its intervention, within the framework of its strategic objectives and mission. Performance indicators establish a relationship between two or more variables, which, when compared with previous periods, similar products or established goals, allow inferences to be made about the progress and achievements of the institutions and/or programs. Ministry of Economy and Finance of Guatemala. MEF, (2010).

Performance Indicator is a tool that provides quantitative information regarding the achievement or result in the delivery of products (goods or services) generated by the institution, covering quantitative or qualitative aspects. Armijo, (2009)

From 2011 to 2015, a total of \$377,550.00 M.N. has been authorized for National Combat Sports Associations<sup>1</sup>; in this period, a number of classified events have been held:

- a) Camps.
- b) Tours.
- c) Olympic cycle events and world championships.
- d) Preparatory events.

During this period from 2011 to 2015, a total of 680 events have been held, distributed in the following sports. (Table 1)

**Table 1.** - Total number of events held from 2011 to 2015 by combat discipline

Sport	Camps	Tours	Olympic cycle events and world championships	Preparatory events	TOTAL
BOXEO	27	2	12	50	91
Fencing	49	18	15	107	189
JUDO	42	2	11	76	131
KARATE DO	13	0	5	48	66
Wrestling events.	18	0	11	43	72
TAEKWONDO	29	0	12	90	131

As can be seen, fencing is the combat sport that has had more preparation events in the period from 2011 to 2015 and karate do the discipline that has performed fewer events, the above has a direct relationship with the results of each of the events of the Olympic cycle. (Table 2)

**Table. 2-** Results of the events of the Olympic cycle from 2011 to 2015

J P 2011	Gold	Silver	Bronce	Total
<b>Boxeo</b>	1	4	4	9
<b>Fencing</b>	0	1	2	3
<b>Judo</b>	0	2	3	5
<b>Karate Do</b>	1	3	2	6
<b>Asociated</b>	0	1	2	3
<b>wrestling events</b>				
<b>Taekwondo</b>	1	1	3	5
Olympic games 2012	<b>Gold</b>	<b>Silver</b>	<b>Bronce</b>	<b>Total</b>
<b>Boxeo</b>	0	0	0	0
<b>Fencing</b>	0	0	0	0
<b>Judo</b>	0	0	0	0
<b>Karate Do</b>	0	0	0	0
<b>Asociated</b>	0	0	0	0
<b>wrestling events</b>				
<b>Taekwondo</b>	0	0	1	1
World games 2013	<b>Gold</b>	<b>Silver</b>	<b>Bronce</b>	<b>Total</b>
<b>Boxeo</b>	0	0	0	0
<b>Fencing</b>	0	0	0	0
<b>Judo</b>	0	0	0	0
<b>Karate Do</b>	-	-	-	0
<b>Asociated</b>	0	0	0	0
<b>wrestling events</b>				
<b>Taekwondo</b>	1	3	1	5
World games 2014	<b>Gold</b>	<b>Silver</b>	<b>Bronce</b>	<b>Total</b>
<b>Boxeo</b>	0	5	5	10
<b>Fencing</b>	3	3	4	10
<b>Judo</b>	1	5	8	14
<b>Karate Do</b>	2	3	4	9
<b>Asociated</b>	4	2	6	12
<b>wrestling events</b>				
<b>Taekwondo</b>	10	1	4	15

For the allocation of budgets, in national team preparation events that are awarded annually to National Sports Associations, there is no system of indicators that evaluates the performance of sports at each event and helps to make decisions on the feasibility of granting financial support to National Sports Associations. This insufficiency in the practice of high-performance sports in Mexico leads to the following objective: to determine indicators for evaluating the performance of Mexican athletes and combat sports in international events.

## **MATERIALS AND METHODS**

The sample used was non-random and was decided by the 6 combat sports where the National Commission of Physical Culture and Sport of Mexico provides financial support for the preparation of national teams.

The analysis of the problematic situation was carried out; later the scientific problem was detected and the methodological design of the investigation was structured; the above was carried out in the period from 1 to 15 April 2015. At this stage, the diagnosis was carried out using information obtained from the programmes and activities from 2011 to 2015.

### **Diagnosis of the evaluation of international sporting events**

Specialized literature on the subject was consulted and the programs of activities of the National Sports Associations of the disciplines of boxing, fencing, judo, karate do, associated fights and taekwondo were reviewed, from 2011 to 2015. From these programs, organized data were obtained in the following aspects.

- a) Amount of economic amount authorized to the National Sports Associations in the period from 2011 to 2015.
- b) Distribution of the total number of events held, classified by type.
- c) Total number of days per year in which national teams participate in international events in relation to the number of days they remain in national territory.
- d) Total participation of Mexican delegations in international events in relation to world dominance by continent.

## **RESULT AND DISCUSSION**

In the review of the specialized literature, there is experience in the use of performance indicators as a proposal for the solution to a problem present in the internal processes of the Performance Sports Program; among them, the following authors are taken into consideration: Suárez, O., (2017); Peñaloza, L. S. J., et al., (2018); Benítez, J. E. M., et al., (2017); Verdura, H. R. et al., (2018); Caraballo, M., et al., (2017); García-Naveira, A. (2016); Jiménez, C. G., et al.

In sport, an indicator is an instrument that measures the performance of an aspect inherent in the athlete's preparation system from preparation planning to performance in a competition. Within the Mexican athlete preparation system, there are international sports events, events that are part of a calendar of competitions, camps, tours, as well as fundamental competitions.

By compiling information on international sports events in combat sports, already announced, between 2011 and 2015, the author of this study has determined indicators that are put at the service of statesmen, sociologists and specialists, motivated to carry out actions in favor of combat sports in the context of international events.

The indicators, their definitions and their evaluative character in the international sports environment will be described below.

### **Efficacy**

Efficacy is the capacity to achieve the effect that is expected or desired following the implementation of an action<sup>3</sup>, i.e. the capacity to achieve a given result. Achieving the objective.

Efficacy applies to the things or people who can produce the effect or provide the service for which they are intended. Mokate, (1999). When one speaks of efficacy, one seeks to establish the fulfillment of plans and programs of the entity, previously determined, in such a way that one can evaluate the opportunity, fulfillment of the goal in the stipulated term, as well as the quantity, volume of goods and services generated in time, Rodríguez Taylor, (2012).

According to Marianela Armijo, (2009) an efficacy indicator tells us about the degree of fulfillment of the organization's objectives, without referring to their cost. Efficacy indicators inherently carry the prior definition of objectives and the monitoring of these through a minimum information system, which allows reporting on basic aspects of the program or management to be evaluated.

### **Efficiency**

Efficiency refers to the ability to have something or someone to get a result<sup>4</sup>. That is, the ability to achieve an end, using the least possible means. An efficiency indicator describes the relationship between two magnitudes, the production of a good or service and the inputs used to generate it. MEF, (2010).

Efficiency indicators measure the relationship between the achievement of the program and the resources used for its fulfillment. These indicators quantify what it costs to achieve the stated objective, without limiting it to economic resources; they also include the human and material resources that the program uses to fulfill the specific objective. CONEVAL, (2013).

### **Quality**

Quality is the qualities set that constitutes the way a person or a thing is. Quality indicators are exclusively aimed at measuring the institution or program capacity, to answer the clients, customers and population objectives. It refers to the characteristics and/or attributes of given goods and services, as to the opportunity, the accessibility, the continuity and the courtesy in the attention. MEF, (2010).

## Economy

Economy is the capacity of an institution to adequately generate and move financial resources in order to fulfill the objectives. Any agency that administers funds, especially when they are public, is responsible for the efficient management of its cash resources, the execution of its budget and the proper administration of its assets. Rodríguez Taylor, (2012). These indicators relate to the capacity of an institution, program or intervention to manage its financial resources, generate its own income to finance its activities and recover loans. MEF, (2010)

In the economic amount authorized to National Sports Associations in the period from 2011 to 2015, it is observed that the total amount authorized in five years, amounts to \$377, 556, 098.90 Mexican pesos m.n. From the above, it can be observed that the National Sports Association that has the most authorized money is taekwondo, with a total of \$ 150, 356, 770.62 and the one that has the least money authorized is Boxing with \$31, 815, 682.00. (Table 3).

**Table 3.** - Total amounts authorized to National Combat Sports Associations for the period 2011-2015

Boxeo	Fencing	Judo	Karate Do	Associated wrestling events	Taekwondo
\$ 31,815,682.00	\$ 72,647,540.79	\$ 47,077,407.18	\$ 34,437,055.68	\$ 41,221,837.63	\$ 150,356,575.62

It shows the distribution of events that the National Combat Sports Association has conducted from 2011 to 2015, which indicates the total number of events in the period mentioned by type, the % that corresponds to the total of all events held and the average number of events by type that have been held in the same period. (Table 4)

**Table 4.** - Distribution of events carried out by the National Sports Associations of combat sports, classified by type

	Campamentos			Giras			Eventos C.O y C.M.			Eventos Preparación		
	Núm.	% total	$\bar{X}$	Núm.	% total	$\bar{X}$	Núm.	% total	$\bar{X}$	Núm.	% total	$\bar{X}$
Boxeo	27.0	29.6	5.4	2.0	2.2	0.4	12.0	13.1	2.4	50.0	54.9	10.0
Esgrima	49.0	25.9	9.8	18.0	9.5	3.6	15.0	7.9	3.0	107.0	56.6	21.4
Judo	42.0	32.6	8.4	2.0	1.5	0.4	11.0	8.4	2.2	76.0	58.2	15.2
Karate Do	13.0	19.7	2.6	0.0	0.0	0.0	5.0	7.5	1.0	48.0	72.7	9.6
Luchas Asociadas	18.0	25.0	3.6	0.0	0.0	0.0	11.0	15.2	2.2	43.0	59.7	8.6
Taekwondo	29.0	22.1	5.8	0.0	0.0	0.0	12.0	9.1	2.4	90.0	68.7	18.0

It shows the total number of days each National Sports Association plans to be in international events and the number of days they have to be in Mexican territory. It is important to point out that the total number of days obtained is taking into account all categories and all specialties of combat sports, which attended the events planned in their programs of activities from 2011 to 2015. (Table 5)

**Table 5.** - Distribution of the total number of days in international events and training days in national territory, in boxing

BOXEO			
TOTAL DAYS			
YEARS	DAYS IN EVENTS	TRAINING DAYS	% TRAINING
2011	254	111	30.41
2012	169	196	53.70
2013	122	243	66.58
2014	327	38	10.41
2015	245	120	32.88
<b>AVERAGE</b>	<b>223.40</b>	<b>141.60</b>	<b>38.79</b>
<b>DESVEST</b>	<b>79.65</b>	<b>79.65</b>	<b>21.82</b>

In the discipline of boxing, it can be observed that, on average, they use 223 days of the year to attend international events and only 141 days of training, in national territory, which represents a ratio of 61.21 % of the time used in international events and 38.79 % of the time allocated to stay in national territory.

**Table 6.** - Distribution of the total number of days in international events and training days in national territory, in fencing

FENCING			
TOTAL DAYS			
YEARS	DAYS IN EVENTS	TRAINING DAYS	% TRAINING
2011	321	44	12.05
2012	286	79	21.64
2013	467	-102	-27.95
2014	541	-176	-48.22
2015	1188	-823	-225.48
<b>Average</b>	<b>560.60</b>	<b>-195.60</b>	<b>-53.59</b>
<b>Desvest</b>	<b>365.92</b>	<b>365.92</b>	<b>100.25</b>

In the discipline of fencing, it can be observed that, on average, they use practically every day of the year to attend international events and without training in national territory, which represents a ratio of 100 % of the time used in international events and without time spent in national territory. (Table 6)



**Table 7.** - Distribution of the total number of days in international events and training days in national territory, in judo

JUDO			
TOTAL DAYS			
YEARS	DAYS IN EVENTS	TRAINING DAYS	% TRAINING
2011	381	-16	-4.38
2012	167	198	54.25
2013	126	239	65.48
2014	160	205	56.16
2015	258	107	29.32
Average	218.40	146.60	40.16
Desvest	103.20	103.20	28.27

In the judo discipline, it can be observed that, on average, they use 218 days of the year to attend international events and only 146 days of training in national territory, which represents a ratio of 59.84 % of the time used in international events and 40.16 % of the time allocated to stay in national territory. (Table 7)

**Table 8.** - Distribution of the total number of days in international events and training days in national territory, in karate do

KARATE DO			
TOTAL DAYS			
YEARS	DAYS IN EVENTS	TRAINING DAYS	% TRAINING
2011	115	250	68.49
2012	79	286	78.36
2013	67	298	81.64
2014	192	173	47.40
2015	108	257	70.41
Average	112.20	252.80	69.26
Desvest	48.83	48.83	13.38

In the karate discipline it can be observed that, on average, they use 112 days of the year to attend international events and 252 days of training in national territory, which represents a ratio of 30.74 % of the time used in international events and 69.26 % of the time allocated to stay in national territory. (Table 8)

**Table 9.** - Distribution of the total number of days in international events and training days in national territory, in associated wrestling

Associated Wrestling			
TOTAL DAYS			
YEARS	DAYS IN EVENTS	TRAINING DAYS	% TRAINING
2011	179	186	50.96
2012	77	288	78.90
2013	45	320	87.67
2014	164	201	55.07
2015	183	182	49.86
<b>Average</b>	<b>129.60</b>	<b>235.40</b>	<b>64.49</b>
Desvest	64.03	64.03	17.54

In the discipline of associated fights it can be observed that, on average, they use 129 days of the year to attend international events and 235 days of training in national territory, which represents a ratio of 30.74 % of the time used in international events and 69.26 % of the time allocated to stay in national territory. (Table 9)

**Table 10.**- Distribution of the total number of days in international events and training days in national territory, in taekwondo

TAEKWONDO			
TOTAL DE DÍAS			
YEARS	DAYS IN EVENTS	TRAINING DAYS	% TRAINING
2011	231	134	36.71
2012	289	76	20.82
2013	233	132	36.16
2014	235	130	35.62
2015	347	18	4.93
<b>Average</b>	<b>267.00</b>	<b>98.00</b>	<b>26.85</b>
Desvest	50.89	50.89	13.94

Once the diagnosis and review phase were completed, the indicators were designed from April 16 to May 4, 2015. This design concluded in four indicators that evaluated the performance of the international sports events that the National Sports Associations carry out during the entire fiscal year. (Chart 10)

As stated and for effects on Mexican sport, performance indicators are broken down into:

- a) Efficacy indicator;
- b) Efficiency indicator;
- (c) Quality indicator;
- (d) Economics.

### **Efficacy indicator**

Efficacy, as an aspect to obtain the proposed result in the international sporting event, uses to determine the level of efficacy, in this indicator, the following defined aspects, in the following formula:

$$IEF = xLO + M + CG + CR + RP + DP$$

Where:

- IEF: Effectiveness Indicator.
- LO: Weighting of place obtained.
- M: Weighting of medals.
- CG: Competitors weighting in graphs.
- CR: Weighting of combats carried out.
- RP: Ranking weight of countries.
- DP: Difference weighting of points.

**Chart 11.-** Weighting for the efficacy indicator

Weighting	Obtained place	Obtained medal	Total competitors in graph	No. of combats performed	Ranking of the opponents	Difference points
6	1o - 3o		128	6 or over		
5	4o - 8o		64	5		
4	9o - 16o		32	4	1o - 4o	
3	17o - 32o	Gold	16	3	5o - 8o	
2	33o - 64o	Silver	8	2	9o - 16o	> 5
1	64o - 128o	Bronze	4	1	> 16o	1 A 4
0						< 1

The interpretation of this indicator indicates that the greater the value of the same, the greater the probability that the event will take place later, derived from the relationship established between obtaining the medal, with the competitive level of the event, manifested in each one of the weightings indicated.

### **Efficiency indicator**

This indicator measures the number of total medals obtained in the international sporting event, in relation to the total number of athletes participating in the Mexican delegation. It is represented by the formula:

$$IEF = (M / D)$$

Where:

IEF: Efficiency indicator.

M: Number of total medals obtained.

D: Total number of athletes.

The interpretation of this indicator indicates that, in combat sports, where the possibility of winning medals is 1 per competitor, the value of the indicator should approach or be equal to 1; this means that the delegation had a high level of efficiency in the international sporting event.

### **Quality indicator**

This quality indicator relates to the number of long trousers accompanying athletes at international sporting events and their relation to the medals obtained.

$$IC = (((S \text{ TPL} \times 100) \text{ DL}) / 10) / \text{TM}$$

Where:

BP: Quality indicator.

TPL: Total long pants personnel.

DL: Total of the delegation.

TM: Total number of medals.

It is important to note that the total number of long pants personnel is the sum of coaches, assistant coaches, physicians, physiatrists, judges and delegates. The interpretation of this indicator indicates that the closer you get to the value of this indicator, the higher the quality of the delegation's participation.

### **Economy indicator**

This economic indicator measures the relationship between the expenditure spent by the federal government through CONADE, which subsidizes international sports events held by National Sports Associations during the year, and the total number of medals obtained by the delegation at the event. To determine this indicator, the following formula is used:

$$IECM = TE / \text{TM}$$

Where:

IECM: Economic Indicator.

TE: Total expenditure for the international event.

TM: Total medals.

This economy indicator is interpreted on the basis of the total investment per medal obtained after the international event.

In high-performance sport, most of the research is oriented towards the solution of problems in the preparation of the athlete, the obtaining of the medal in the events of the Olympic cycle (regional games, continental games, world championships and Olympic games). However, the administration of high performance also has different problems to solve, although Article 52 of the General Law of Physical Culture and Sport of Mexico states that National Sports Associations are the highest technical instance of their discipline and represent a single sport in all its modalities and specialties, in terms of recognition of their respective International Sports Federation. All the programs of these associations are subsidized with public money, therefore, the Mexican government has the legitimate right to evaluate and, if necessary, suspend or modify the sports programs of the sports associations, according to the national interest.

The need for indicators that indicate the performance of international sports events is a problem that requires permanent solutions, especially in those countries where the sports system is based on government budget. In this work, a contribution is presented for the solution of this problem that constantly will have to be revised and perfected according to the development of the phenomenon.

In general, these indicators have allowed an objective and integrating evaluation of the performance of the athletes under study and, at the same time, has served as feedback for the planning of future sports events.

## **BIBLIOGRAPHIC REFERENCES**

Armijo, M. (2009). Lineamientos metodológicos para la construcción de indicadores del desempeño. Presentado en Curso internacional: Planificación estratégica, preparación y evaluación de proyectos. ILPES-CEPAL-CAPRADE. Recuperado de <http://www.cepal.org/ilpes/noticias/paginas/0/35060>

Benítez, J. E. M., Cabay, L. C. C., & Encalada, V. D. G. (2017). Formación inicial del docente de educación física y su desempeño profesional. *EmásF: revista digital de educación física*, (48), 83-95. Recuperado de <https://dialnet.unirioja.es/servlet/articulo?codigo=6121667>

CÁMARA DE DIPUTADOS DEL H. CONGRESO DE LA UNIÓN Secretaría General  
Secretaría de Servicios Parlamentarios. LEY GENERAL DE CULTURA FÍSICA Y  
DEPORTE. (2013). Recuperado de  
[http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCFD\\_190118.pdf](http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCFD_190118.pdf)

CONEVAL (2013) Guía para la Elaboración de Matriz de Indicadores para Resultados.  
Obtenido de: [http://www.coneval.org/  
mx/Informes/Coordinacion/Publicaciones%20oficiales/](http://www.coneval.org.mx/Informes/Coordinacion/Publicaciones%20oficiales/)

DAFP (2012) Guía de elaboración de indicadores, Departamento Administrativo de la  
Función Pública (DAFP) Bogotá.

García-Naveira, A. (2016). Área de Psicología de la Real Federación Española de  
Atletismo: programación y desempeño profesional. Cuadernos de Psicología del  
Deporte, 16(1), 251-258. Recuperado de  
[http://scielo.isciii.es/scielo.php?script=sci\\_abstract&pid=S1578-  
84232016000100023&lng=es&nrm=iso&tlng=es](http://scielo.isciii.es/scielo.php?script=sci_abstract&pid=S1578-84232016000100023&lng=es&nrm=iso&tlng=es)

Jiménez, C. G., Martínez, A. G., & López, M. A. (2018). Propuesta de indicadores de  
la Responsabilidad Social Universitaria conforme a la guía G4 del GRI: el caso  
de la Universidad de Córdoba. CIRIEC-España, revista de economía pública,  
social y cooperativa, 0(87), 103-137. Recuperado de  
<https://doi.org/10.7203/CIRIEC-E.87.6861>

Maqueira Caraballo, G. de la C., Brito Taboada, E., Recalde Ayona, A. V., Arévalo  
Suquitana, J. A., Sáenz Gavilanes, J. V., & Sandoval Jaramillo, M. L. (2017).  
Tendencias y manifestaciones del temperamento. Relación con el desempeño  
social y físico-deportivo en estudiantes. Revista Cubana de Investigaciones  
Biomédicas, 36(2), 127-137. Recuperado de  
[http://scielo.sld.cu/scielo.php?script=sci\\_abstract&pid=S0864-  
03002017000200011&lng=es&nrm=iso&tlng=es](http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=S0864-03002017000200011&lng=es&nrm=iso&tlng=es)

MEF (2010) Guía De Llenado Formato De Informe de Avance Físico, Financiero E  
Indicadores De Desempeño De Préstamos Externos. Recuperado de  
[http://dcp-  
web.minfin.gob.gt/Sie\\_Abrir\\_Archivo.aspx?file=C%3A%5C%5CPublicaciones  
%5C%5CSistemas%5C%5CDCPWEB%5C%5CDocumentos%5C%5CGestion+  
Ejecucion+Admon%5C%5CGUIA+INFORME+  
AVANCE+FISICO+FINANCIERO.pdf&fbclid=IwAR3UWIPeuLJ4n7rsgej3uevfJ8k  
\\_Y5pr57\\_9Bft2XbxZLRdYkM8A5mKVfdw](http://dcp-web.minfin.gob.gt/Sie_Abrir_Archivo.aspx?file=C%3A%5C%5CPublicaciones%5C%5CSistemas%5C%5CDCPWEB%5C%5CDocumentos%5C%5CGestion+Ejecucion+Admon%5C%5CGUIA+INFORME+AVANCE+FISICO+FINANCIERO.pdf&fbclid=IwAR3UWIPeuLJ4n7rsgej3uevfJ8k_Y5pr57_9Bft2XbxZLRdYkM8A5mKVfdw)

Marie Mokate, K. (2019). Eficacia, eficiencia, equidad y sostenibilidad: ¿Qué  
queremos decir? Recuperado de Departamento de Integración y Programas  
Regionales Instituto Interamericano para el Desarrollo Social website:  
[https://docplayer.es/17879726-Eficacia-eficiencia-equidad-y-sostenibilidad-  
que-queremos-decir-karen-marie-mokate.html](https://docplayer.es/17879726-Eficacia-eficiencia-equidad-y-sostenibilidad-que-queremos-decir-karen-marie-mokate.html)

Peñaloza, L. S. J., Russo, C. A., & Ortiz, P. M. G. (2018). Herramienta informática  
para el vaciado de la evaluación al desempeño pedagógico de los docentes de  
educación física. Revista Con-Ciencias del Deporte, 1(1), 239-252. Recuperado  
de <http://150.187.216.84/revista/index.php/rccd/article/view/508>

Rodríguez Taylor, E. (2012). Guía para la construcción de indicadores de gestión. Bogotá, Colombia: Departamento Administrativo de la Función Pública. Recuperado de <http://casadetrabajosocial.com/wp-content/uploads/2018/12/guia-1.pdf>

Rodríguez Verdura, H., Lara Caveda, D., & Rodríguez Soriano, C. E. (2018). El profesor de la iniciación deportiva y la evaluación de su desempeño. *Lecturas: Educación Física y Deportes*, 22(237), 64-69. Recuperado de <https://efdeportes.com/index.php/EFDeportes/article/view/77>

Suárez, O., Hernández, P. A. M., & Iglesias, M. M. (2017). El desempeño profesional docente metodológico del profesor de Educación Física. Propuesta de indicadores para su medición. *PODIUM: Revista de Ciencia y Tecnología en la Cultura Física*, 12(2), 115-127. Recuperado de <http://podium.upr.edu.cu/index.php/podium/article/view/719/html>



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