The principles of sports training as a methodology alternative in the cognitive development of the human being

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Abstract. This research focuses on establishing a relationship between the principles of sports training and the processes of cognitive development of human beings whose general objective lies in the design of a methodological alternative. In this sense, sports training are understood as one of the most widely disseminated and researched topics on an international level in the field of sports, where there is a wealth of theories and trends that help to base and investigate human development processes; hence it is understood as one of the central categories of this work. In this regard, Bautista [1] calls us to recognize sports training as a pedagogical model in the educational field. Therefore, it is very important to establish as fundamental parameters the classification of training principles, divided into two large blocks by Muñoz and Soto [2], the Biological principles and the pedagogical principles. In this thread, it is important to highlight the category where the above is based, cognitive development understood as the axis that implies the identification of changes that influence the different representation structures that operate in the cognitive system and that point to the rediscovery and reconstruction of new knowledge. Hence, the guiding question raises: What is the relationship between the principles of sports training and the processes of cognitive development in the human being? Thus, the methodological route of the present study responds to the interpretative paradigm, specifically it is oriented from the qualitative design. Therefore, it exposes an approach to the establishment of possible relationships between the categories of analysis.

1. Introduction

"Neither the athlete nor the coach (teacher) are producers of passenger sports results, but mediators of intellectual skills (intelligence actions), adaptive skills transformers owned by those who learn them" [1].

Throughout time from the field of psychology has tried to identify, analyze and understand How does the human being learn? As a result of this, strong theoretical conceptions have been known for many years to explain this process. Among the most relevant are the Piaget [3] and Vygotsky [4] approaches, and the epistemological orientations of Ausubel do not depart from them [5]. They have been theoretical conceptions that guide the teaching-learning processes in schools, including the forms of relationship of the subject in society. On the other hand, the training itself, from a rudimentary perspective or if you want to read from the traditional, was conceived as the opportunity of man in terms of preparing for life in terms of survival. The new theoretical and practical constructions of this field indicate that the objective is not only the preparation of the high-performance athlete, but the stimulation in the motor state focusing on the cognitive, motor, affective, axiological, social contents proclaimed as well as the science that seeks the training of the athlete in a whole [6]. Based on the above, the question that leads...
this proposal raises: How to establish a methodological alternative from the principles of sports training, aimed at the processes of cognitive development in the subject? Specifically, the bibliographic tracking does not account for investigative processes that pose different relationships between the field of sports training and cognitive development. However, it is worth highlighting research that recognizes sports training as a mediating axis of socialization processes, behaviors and behaviors through the preparation of the athlete in their different ages and contexts.

In this regard, Bautista highlights "sports training as a pedagogical practice that is interdependently related to the phenomena and processes that allow the development of the individual within the scope of his knowledge, that is, his intelligence". In this line, Carrasco affirms that the athlete participates actively in training, knowing what he does, how he does it and what he does. At the same time, it contemplates that the preparation and conduction of the training must be oriented towards a task that allows the trainer and his trainees to know the reason and why of the task. In addition to the above, Levpavlovich states that "The theory of sports includes the theory of sports training supported by the theory of development and the theory of education of the individual" development and education "in this sense is understood the process of the transformation of their properties during the stages, periods and cycles quite prolonged of the vital time of the subject".

According to the above, to refer to sports training involves recognizing the aspects that make it up and nourish it, within these aspects as a fundamental pillar are the principles of sports training classified in pedagogical and biological as referents from the methodological and adaptive, defined according to Carrasco as the guidelines that are strengthened in the different sciences: pedagogical, psychological and biological, enabling the trainer to adequately implement global content, methods and planning, as well as control over the trajectory of preparation. For this case, the hypothesis of this study lies in conceiving the principles of sports training as a methodological alternative in the process of cognitive development of the subject. It should be noted that the above responds to the first phase of the construction of the investigative process, in this sense, it gives an account of the conceptualization and contextualization, as opposed to the first relational approach between the main categories of analysis: principles of training (pedagogical, biological and psychological) and cognitive development.

2. Methods
The present study is based on the interpretative paradigm. Specifically responds to the qualitative design, because at first (conceptualization phase) required review processes clearly analytical and interpretive in order to build possible conceptual and practical relationships between the main categories of analysis. With the purpose of establishing (cross-contextualization phase) transversal relationships between the aforementioned categories of analysis, and thus envisioning a methodological strategy that poses emerging dynamics in the teaching-learning process.

3. Results and discussion
The present conceptual approach in the first instance refers from the theory to the subject of sports training from the principles, those expressed from physiology as theoretical elements that try to explain the organic function of the subject, and those recognized from the pedagogical field, referred to the cognitive and axiological dimensions of it. In this sense, it is necessary to affirm that sports training from a biological perspective is defined as "the systematic repetition of muscular contractions above its threshold producing morphological and functional adaptations" [9]. From the pedagogical perspective, it is recognized as the orientation of the structure and organization of the configuration of the human being. In this way, it is clear that the concept allows the teacher and the student to be placed on the scene as protagonists of the development of knowledge, who are irreplaceable within the teaching-learning process, and who are in charge of recognizing and understanding the complexity of their interaction.

In general, the intention of sports training should start from the conception of the whole, not the particular, so that the subject is valued as an integral being that manifests and shapes from the following relational spheres: affective, volitional, cognitive and psychomotor, making it a thinking, sensitive and in need of movement. The foregoing allows to state that sports training is assumed as a methodological
process and adaptation, which in terms of the cognitive, can be assumed as a possible methodological mediation that enables the modifiability of the cognitive structures of the subject who learns. To focus more specifically on the category object of interpretation, the following are related from Solano and Nuñez [10] the principles of training considered as fundamental (see Figure 1).

**Figure 1. Principles of training [10].**

The above, allows to identify the requirement to which the subject is subjected from its organic functions, from where it begins to raise changes not only in terms of the development of physical abilities, but also affective-emotional elements that influence sports training.

In this sense, the importance of the balance / stability necessary between the affective-emotional factor and the physical-biological is recognized, so maintaining a clear and coherent intentionality will allow establishing successful sports adaptation processes in terms of the development of the subject. Therefore, it is valid to project the structural changes according to a subject that through sports practice can carry out social actions that allow him to bring the partner or a group-team closer to achieving their sporting goals, whether individual or common, and perhaps overcome the adversities of the context from the development of physical, technical, tactical and psychological capabilities. Therefore, pedagogy as a field of reflection begins to gain value in the arena of sports training, because any process with a pedagogical perspective allows us to recognize the different appreciations and relationships that make possible the configurations of new conditions and possibilities of doing and being.

From the disciplinary approach is important to address the views that are held from the psychology on the concept of pedagogy, in this regard is recognized as the evolutionary processes in educational environments that allow to establish solutions to a problem, for example "the pedagogy is not another which is the extension of modern methods of psychology to properly pedagogical problems, and especially to school problems "[9, 10]

Another recognition of the term is seen from the creative opportunity, while establishing the pedagogy as a field of recontextualization of sports training, and against this, the deconstruction of the priority given to the expression of the result, establishing a new priority riches of social interaction where several elements converge that can strengthen a better process of the cognitive development of the subject starting with sports training.

Thus, the analysis discussed so far addresses the training as a pedagogical, biological and methodological process taking into account that the literature leads us to the search to achieve a goal determined by the planning of the loads, without ignoring the appropriate recovery processes, providing stimuli individually, progressively and multivariate.

Regard the category of cognitive development, it is feasible to recognize from the different interpretations that respond to how does the subject learn? It is not a matter of simple biological nature but promulgates by a multidisciplinary work that implies to recognize in the first instance that it is a process that includes traits of biological, psychological and socio-cultural character. To start the discussion, we start from the postulates proposed by Piaget, who argues that the construction of knowledge of the human being given in an educational and formative context such as school is complemented by the intellectual and physical development in which it is mediated. Broadly speaking, the theory put forward by Piaget [3] refers to six stages of development:
1. Stage of reflexes or hereditary adjustments.
2. Stage of the first motor habits and the first organized perceptions.
3. Stage of sensory-motor intelligence.
4. Stage of intuitive intelligence.
5. Stage of concrete intellectual operations (start of logic).
6. Stage of abstract intellectual operations.

The previous stages are recognized by Piaget as structures of variable character that start from motor/intellectual aspects, individual and collective, in addition to the affective, that is to say that it is not a finished process, on the contrary it is unstable, changing and dependent [3]. For his part, refers that learning can be developed from the inductive (discovery) and deductive (reasoning), in turn says that the "individual" reaches an optimal development of learning when he starts contact with the object of study from his experience. In this regard, it points out three stages:

1. Symbolic (makes use of a concept and approaches abstract thinking).
2. Iconic (makes use of images and approaches imaginative thinking - projective).
3. Enactive (makes use of actions and intuitions and approaches a concrete thought, therefore manipulable - moldable).

As a complement to the above, Ausubel [5] points out that learning in the human being occurs when it transcends the memorization of content, when it manages to find meaning and meaning in what it learns. That is, when new ideas can be learned and retained, and their organization is clear and available to be anchored to existing concepts. This learning process signals itself processes of compression, transformation, storage and use of information. Ausubel [5] manages to distinguish three types of learning:

1. Learning of representations: the human being attributes meaning to symbols by associating them with their objective references.
2. Learning concepts: the human being abstracts from the objective reality those common attributes.
3. Learning of propositions: ideas that result from a logical combination between terms and symbols.

As a complement, Vygotsky [4] develops his theory from the socio-cultural perspective, from where he defines that learning is a social and cultural - collaborative construction, so that human beings can enhance their development from interactions and interrelations with other Humans. Consequently, the development of the human being must be understood as a socially constructed goal.

Therefore, to speak of cognitive development implies to recognize the development as a theoretical-practical category that in a first moment reconfigures the discourse of the mediator-teacher-teacher-teacher, because it calls it to question itself for what happens to the subject, for its transformations, configurations and their mediations. Second, it involves testing what is considered relevant for the subject to learn, in this line thinking the ways as the subject learns and deconstruct and reconstruct and contextualize (without ignoring) the theories and postulates, depending on the intentions of the subject educational act.

In this sense, Antoranz and Villalba define development as "the changes that the human being lives throughout its existence" [12]. To this are added determinant features of development as inheritance, understood as the set of features and characteristics that transmit parents, the environment as the set of circumstances surrounding a person, maturation as the differentiation of biological structures and functional capacities, and learning as "the acquisition of knowledge, skills and abilities [12].

So, the development derived between the feature of maturation and learning (ie the cognitive) assumes a number of characteristics, from Antoranz and Villalba should be progressive, continuous,
cumulative, directional, differentiated, organized, holistic, stable/changing, variable, orderly, cyclical and repetitive, finally as a fundamental feature must recognize the individual and cultural differences of each subject [12].

By way of closure, it is pointed out that it is worth establishing relationships between what is proposed from the principles of training and approaches to cognitive development. Well, the educational act requires a general structuring of a plan of action that does not differ from the conditions mentioned when starting the above, namely the biological, psychological and socio-cultural. As a result of the foregoing, a possible transversal relationship is established between the categories of analysis, based on a methodological strategy that enables cognitive changes in the subject based on the reconfiguration of the contents (see Figure 2).

![Figure 2. Transverse relationship and methodological strategy.](image)

4. Conclusions

By way of closure, we note that the educational act requires a general structuring of an action plan that does not differ from the conditions and possibilities of the subject who learns namely the biological and socio-cultural.

The principles of sports training are considered methodological horizons that could enable changes in traditional structures that are established from the academic in terms of processes of cognitive development in the subject.

All process of construction of knowledge, in addition to answering a guiding question, is committed to convene and motivate the scientific community to keep generating questions, in this sense what calls to continue building academy, involves testing what is considered pertinent that the human being learn, in that line deconstruct and reconstruct the theories and postulates that are in function of the intentions of the educational act.

References

[1] Bautista Jimenez R 2001 El entrenamiento deportivo como modelo pedagogico de construccion Lúdica Pedagógica 1(6) 37-47
[2] Hernandez Rodriguez A I, Martinez Muñoz L F and Aguila Soto C 2008 El deporte en la sociedad contemporánea (Almería: Editorial Universidad de Almería)
[3] Piaget J 1991Six studies of psychology (Barcelona: Editorial Labor S.A.)
[4] Vygotsky L 1979 The development of higher psychological processes (Buenos Aires: Editorial Grijaldo)
[5] Ausubel D 1976 Educational psychology. A cognitive point of view (Mexico: Editorial Trillas)
[6] Kuhlow C 1975 The science of training as a scientific discipline (Madrid, Editorial Paidotribo)
[7] Carrasco F 2006 Training and skills Scientific Journal 2 23-26
[8] Lepvavlouch L 2001 Theory and methodology of sports competition (Spain: Editorial Paidotribo)
[9] Hohman A, Lames M, Letzelter M 2005 Introduction to the science of training (Spain: Editorial Paidotribo)
[10] Solano C and Núñez D 2011 Training adaptation processes Scientific Journal Health Sciences 6 33-36
[11] Gaston M 2010 Psychology of Education (Mexico: Editorial XXI Century)
[12] Antoranz E and Villalba J 2010 Cognitive and motor development (Madrid: Editorial Editex)