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# Efitec, software for the evaluation effectiveness model of the technical

**R D Merchan-Osorio<sup>1</sup>, J Florez-Florez<sup>1</sup>, W F Caro-Cely<sup>1</sup> and J A Verdugo-Acevedo<sup>1</sup>**

<sup>1</sup>Grupo LERD, Fundación Universitaria Juan de Castellanos, Tunja, Colombia

E-mail: rdmerchan@jdc.edu.co

**Abstract.** Nowadays sports levels are increased to a high degree thanks to the use of tools and instruments that combine the use of technology with the sciences applied to sports. Football is not the exception; thanks to these technological and scientific advances it has been possible to improve not only the sports performance but also the way in which each one of the factors that determine the sport form is controlled. In Colombia today, you can optimize football through specialized software that allows you to measure, quantify, plan and organize the tasks and means of this sport. For this reason, this study aims to design an application that allows measuring the level of technical effectiveness of the shot on goal in football. This will help to improve sports performance and thus increase technical levels, allowing a better planning of the daily structures of sports training and thus contribute to the improvement of this sport by optimizing the times and the easy handling of technology, computer science and more important the results in the competition.

## 1. Introduction

Team sports and, more precisely, interaction sports with shared space (DIEC) [1], make up and are part of the select group of disciplines practiced with high training loads and in need of training differentiated. These processes of organization, planning and ordering of each of the components, processes, protocols and procedures need more and more sophisticated means to perform the control and optimization of the factors that determine the sports performance in these disciplines.

The high competition needs now greater and faster information of what happens at every moment of the season. The levels of technical effectiveness of the players every time plays a priority role to determine the final result of the game, there is no time to wait on the part of the coaches, managers and actors of the sport, to know the current state of the athletes; for this and many more reasons it is vital to develop software that determines in a specific way in which state the soccer players are at the moment of executing the technical action of the shot on goal since this is the most important action in the game of soccer.

This application allows the football coach or coach to know exactly the level of the athlete and have a database for monitoring and controlling the levels of technical effectiveness of the players' shooting, during the training sessions thus also allowing finding the methodological models or the specific means for the improvement of this sporting gesture.

The present work presents results obtained by this tool and the operation of this as it allows characterizing the levels of technical effectiveness of the shot to door.



The study involved different populations of amateur, semi-professional and professional players from different cities of Colombia who showed a lot of interest when making the tests for the novel and easy to understand.

The protocols were initiated with the setting and presentation and explanation of the tests, then piloting was carried out to discriminate margins of error and later the test was made.

After this information was analyzed, interpreted and performed the corresponding statistics to know how reliable the tests were, this was verified and corroborated with the payroll completed by experts who already knew the tests and gave their concept through trials. That they applied.

## **2. Experimental methodology**

The methodology proposed for this study is as follows: application research according to (Padrón G 2006) [2]; the start is a problem situation, it is intervened, and a detailed description is made under criteria of scientific research methodology.

Then the theory is selected, it is exposed, and the basic and specific concepts are given. The next step is to examine the situation described above and derive the corrective actions of the prototype that was exposed in phase two that could solve the problem situation all this under systematic parameters and associated instrumentation.

Next, in the next stage, the prototype test tests that are born from the theoretical components of the previous stages are carried out and the probability that the new model or the application designed to solve the problem is determined.

For this study, it corresponds specifically to the protocol of evaluation of the level of technical effectiveness of the shot to goal which aims to measure and quantify the current state of the athletes under study. It aims to improve and control more and more the performance of athletes who practice this type of sports and improve technological processes and the use of new technologies applied and combined with science and research methodology.

Based on these theorists, an analysis, design and implementation of the system for the evaluation and control of subsequent sports gestures is carried out. At the end of all this process, the verification is carried out by experts in the combined areas for this work, so as to be able to reengineer and improve the application.

The methodological model presented in this study is of the Scrum type (Agile Projects ORG, 2014), which allows the system to be developed by means of stages, in each case part of the application is obtained, which is validated by the clients in this case the coaches and players that guarantee the proper functioning of the application.

The phases of the process are the following: information and spreadsheet, tests or test, evaluation and execution of the test, control and analysis thereof and finally verification.

In each one of them, specific activities are carried out for the development of the software and the research process.

### *2.1. Research*

This stage the characteristics, the contents and the working functions of the work are shown, the variables of the operating system are established; an analysis is also carried out, the interpretation of the data, the methodological, technical and technological framework of each sub phase. In this phase, a document is generated. In this phase, an initial document with descriptive specifications is generated, plus detailed techniques of the investigative process.

- The purpose of this research work is to characterize the level of technical effectiveness of the players under study, by using an evaluation model that allows knowing the technical status of the established groups, more specifically the shot on target, which is the determinant variable in this sport modality.
- During the implementation process, a first test called the pretest was performed, which determined the initial state of the application. After four months, a second test called posttest

was carried out. These two applied tests are composed of the technical variable: shot on goal, chosen and scientifically based thanks to the analysis and study of previous research works [3].

## 2.2. Planning

In this step of the research process are defined scopes, limitations and external factors involved in each stage of the implementation. The protocol developed is observed and controlled, the mechanics of the application are adjusted, the design is carried out, the manuals and procedures are adjusted of the tests, the phases are improved and a first report with the previously registered information is delivered.

Therefore, this study is structured in a quantitative approach, because a set of systematic and empirical stages were applied to the study of the implementation plan of the application of this research [4]. The present work was developed through the structuring and execution of the following elements and investigative procedures:

- Preparation of spreadsheets for each technical variable.
- Pilot test to eliminate error factors.
- Internal validation of instruments.
- Collection of information.
- Quantification of data.
- Data systematization.
- Statistical treatment of data.
- Analysis of data and results of the information obtained.
- Approach of conclusions and recommendations.

The type of research is Evaluative due to the use of mechanisms that allow us to evaluate the level of technical effectiveness of the shot at goal of the soccer players under study. In addition, systematic and structured evaluation techniques of the events occurred were used. The analysis of these results allowed us to structure a characterization of the players under study and improve the sporting results in that direction, guidelines offered by the evaluative research [5].

## 2.3. Development

In this phase, the construction of the source codes is carried out, which is reflected together with the requirements and characteristics defined for each step, pilot tests are made, and controls or posttests are made that are necessary for the completeness of the system. A second report with the prototype of the application is delivered at the end of this phase and adjustments are made to the architecture of the test system.

From a classical perspective, technique is understood as the result of the cognitive and nervous processes of perception and tactical thinking, counting on the physical characteristics and skill level of the executor [6]. It is also interpreted as the mode of achievement of a motor objective, [7] indicated by tactics, taking into account the level of development of psychic and motor characteristics, highlighting the dependence on tactics and technique. In other words, it is the motor or visible phase of the game action.

It is understood then that these factors are interrelated, and it is easy to think that the skills of the athlete are revealed by physical qualities in sports. Therefore, it is understood the technique as a procedure, that leads directly and economically to achieve a high result. It is defined as an economic procedure or process; this term is being understood as the perfect realization between the motor project and its realization [8].

The sports technique is interpreted as the ideal model of competition action, developed on the basis of practical or theoretical experience in the athlete when performing the competition, which is characterized by such or such degree of effective use by athletes. This one, and of his possibilities to reach the sport result [9].

It can be proposed, then, that technical instruction would go through a first stage of a trend towards multilateral, multi-purpose development. A second one of general preparation of the chosen sports technique, and a third of special preparation or specialization, in which the chosen sport modality and the position or function that the athlete plays in his field of play or in the field of development of your sport.

The process of technical instruction could then be decomposed into four phases instead of three, as follows [10]:

1. Information and apprehension phase. The athlete takes knowledge of the movements to be learned and creates the necessary bases for the conception of an action project. At this point, his previous motor experiences, his motor level and his ability to observe help the subject.
2. Rustic coordination base. The first experiences of practical execution, such as verbal indications, represent the main information of this phase. At the end of this stage, the domain of the problem is in a rustic phase. The phenomena related to this level are: an excessive and partially erratic effort; the abruptness in the temporal development; the angular execution of movements; the insufficient amplitude; the false motor rhythm (very fast or very slow); the lack of rhythm and sequence and the lack of motor precision.
3. Fine coordination phase. The phenomena that characterize this stage are: the adequate energy cost, the necessary force expenditure, the amplitude, the rational motor rhythms, and the most fluid movements. The increase of the motor precision is here globally linked to a constant perfected understanding of the verbal or other information.
4. Consolidation, refinement and variable availability phase. In this phase, we find the successful coordination of movements, even in difficult or unusual conditions. Automation allows the athlete to focus attention on the critical points of motor development, and precisely the phenomenon that characterizes this stage is the constant and harmonious fluidity of the movements.

The achievement of these objectives allows developing more specific forms of training to avoid execution errors that start from the comprehension (cognition) that, the athlete has of its technical realization. In this line is the training based on the so-called Principle of clarification or discrimination by which tests are performed with artifacts of different weights, so that by kinesthetic differentiation, certain problems are solved, of execution, fundamentally in the application of forces.

It also gives the possibility of failure to recognize the real origin of errors in the execution of technical skills. In the same way, cognitive processes achieve the stability of the athlete with respect to the motor performance of the technique to achieve high performance in any circumstance, which is called "Constancy of movement" [11]. Cognitive processes also have a high participation in the elimination of the so-called "Speed Barrier" or "Speed Block" [12]. As well as other applications both in the competitive sphere, and as application in the training phases of technical skill.

Therefore, in the training process of the technique, both forms of motor participation should be used, as well as cognitive-affective participation, which complicates its application and lengthens it during practically the entire sports life of the subjects. It will be necessary to use different forms according to what the athlete needs to improve his technique, because each of these training options are more or less effective for the achievement of one or other technical objectives, which must be obtained in the course of the different stages of the formation of technical skill.

The teaching of football indicates that for a long time we have made our children play in imitation of adults. Moreover, for the young child, adult football is too "big", too difficult and complex because it requires a level of physical and mental abilities that children do not yet possess [13].

Instead of adapting the child to football, as it happens everywhere, we must know how to adapt football to the child, always to its perfect measure throughout its growth, like his shoes or his coat. Doctor Wein [13], an internationally recognized expert in team games who has dedicated himself for years exclusively to the important task of recycling the knowledge of football coaches, explains in a

simple manner why and how of the need to adapt the game of soccer in all of its facets tailored to the child. In the first place, it is questioned whether children between 7 and 13 years old should compete in the regulation football, in imitation of the adults with eleven players in each team disputing a regulation ball in a field with giant dimensions and goals in which the goals are lost small goalkeepers.

I think he is right. If a child of seven or eight years still does not know how to dominate his body, how can he be expected to dominate the ball and one or more opponents? He is still exposed to exercise with a ball that reaches almost to the knee, a weight that his leg can't move easily and lack of time due to the presence of a large number of adversaries and colleagues around him, in search of This appreciated ball that everyone wants to have as long as possible.

Thus, a child comes to play three or four times the ball or a maximum of one minute in each game, completely insufficient to give him the necessary stimuli to be able to grow. Therefore, says Wein [13] in the aforementioned book that: "many players die with 33 -35 years on the football field, before they were born completely, by exposure to inappropriate methods, training contents and competitions during his best years of motor learning, between 8 and 12 years old".

#### 2.4. Validation and evaluation

The In this stage we will show the results obtained in the pilot tests and we will talk a little about the application; this application is accessible in smartphones, tables and computers. Its architecture is designed in a JAVASCRIPT language by means of ANDROID studio and is connected to MYSQL database management systems. Also, how much with a security system of 3 types of user.

Super user: The first one is a user who can add clubs or teams and at the same time athletes to whom they want to evaluate, this same user will also have available to perform the evaluations.

Evaluating user: The second user is made for the evaluators, since it will only allow the player to be selected and he will be able to enter the data he takes during the evaluation.

The third user is made for people interested in knowing the data and it is designed to be accessed through the computer.

In this stage the expert judgments will be presented, and the previous stages will be verified in order to be able to carry out the final evaluation of the application.

### 3. Results

The results of this study are under construction. This work is a contribution to the scientific, academic and sports training community and will enrich the specialized literature.

This work will also allow to control and evaluate the technical gestures to be able to find faults in the movements of execution of the sports technique.

With the implementation of this work it will be possible to establish a modeling of the characteristics of the phases of sports techniques.

### 4. Conclusions

The model of evaluation of the level of technical effectiveness of the shot to goal developed in this application allows elite sports development. In addition, the correct development of this type of work offers equating and optimizing the technological and methodological tools that make possible the evaluation of the planning and organization processes of sports training.

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