ABSTRACT

A STUDY ON IMPROVING THE MOTOR REACTION IN 11-12-YEAR-OLD SOCCER PLAYERS AFTER USING THE PROBLEM-SOLVING METHOD

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The continuous development and improvement of the soccer player is based on the following features: physical characteristics regarding height and physical conformation encountered in different variations and combinations such as speed, mobility, strength, flexibility and coordination; intellectual abilities such as intuition, memory, perception, concentration, creativity, anticipation, abstract thinking and judgment. Motivationally, he is concerned with the desire to overcome the highest game level, the need to be accepted, and the desire for strength and control. His emotions and temper embody a whole range of feelings, represented by courage and fear, determination and indecision, impulsiveness and prudence, self-confidence and insecurity.

Following the stages of maintaining the level of performance and improvement in this field, we proposed to conduct a research entitled "*Study on the Improvement of the Motor Reaction in 11-12-year-old soccer players after Using the Problem-Solving Method"*, which aimed at developing the modalities for achieving the educational process, by stimulating the independent work and creating problematic situations, in order to prepare the young soccer players. Their capitalization can be found in the optimization of the soccer training with a role in improving sports performance.

In order to train children, one of the determining factors is the need to identify certain technical motor adaptations in the player's behaviour, for optimizing his reactions in the unpredictable situations of the soccer game. Together with the formation of a broad technical-tactical kit, by using the learning algorithms, young soccer players are able to improve their motor behaviour, execution capability and precision of movements, which are necessary to solve various situations during the game.

Any activity performed by a human requires knowledge and skills of acquisitions assimilated in time which allow one to manifest a certain type of behaviour. The activities carried out, if they are pursuing a technical

acquisition, must be different and should seek to change the role of an athlete, from the passive role of memorizing and literal learning to "an active, discovery, interpretation and involvement role" (Cojocariu , V.M, Secara, L., 2005).

Coaching for the training of a soccer player (even from childhood) is mostly done through an inductive process based on the excessive use of explanatory and exemplary methods, based on the coach's intervention by presenting his own solutions to solving the moments of the game without giving the children the opportunity to expose their logic or variants to solve the situation in order to be discovered through physical and psychological efforts. Sports performance specific to sports games requires "intelligent motor behaviour that implies speed, swiftness, coordination, efficiency, based on the awareness of the kinesthetic impulses, on the control of the body and of various segments" (Tudor, V., 2013), or all these aspects are formed and perfected both through technical and tactical training, as well as through physical and psychological training. The execution technique as a "live movement is not just a reaction to the action of the external environment, but an action oriented towards a purpose. These aspects have led us to carry out a scientific inquiry that focuses on applying the problem-solving in terms of improving the technical behaviour of young soccer players in accordance with the requirements and the needs imposed by the unpredictable situations encountered in the soccer game.

Without knowing and understanding how to apply the problem-solving method, the age-specific degree of solicitation, and the player's technical, tactical and linguistic knowledge kit in accordance with the needs of the game, it is not possible to plan, organize and conduct an optimal and effective training activity.

Problem-solving is the method by which the greatest amount of knowledge is accumulated, and at the same time it requires a decision to be made by analyzing one or more possibilities of motor or cognitive response, which calls for memory, speed of analysis and decision.

Raţă G. (2008) considers that in sports training "the exercise through deduction and creative thinking, resulting from the analysis and comparison of the situations that appeared freely or intentionally caused by the discovery of the relations between the knowledge, skills and knowledge already acquired" is the basic direction of the training process.

Due to the fact that the soccer game has a situational character, in order to make the training more efficient it is necessary to use an operational program oriented on the principles of the problem-solving method, because it involves the creation of some complex theoretical and practical situations requiring the players to concentrate in finding optimal solving solutions in accordance with the unpredictable nature of the moments of the game, but

especially with the short solving time which requires quick thinking and decision.

The training conception involving problem-solving is a matter of developing, designing, experimenting and validating an educational study in the true meaning of the word, but also a pretentious goal because practically it claims the coach's creativity, fantasy, concern and inventiveness. He must have the ability to create problem situations in which real aspects of the play can be found so as to cause the player to select the optimal solution for the purpose of developing his creativity and the player's reaction.

Regarding the training process, encouraging children to engage in independent solving, various emerging or intentional situations is an indispensable way of operating, but also stimulates them to achieve great performance and not only.

This pedagogical process focused on the use of the problem-solving method proposes a current modern training vision with the intention to make a significant contribution to increasing players' performance by designing a scientifically-guided training in which both its content and scheduling are in accordance with the current and future norms of the development and improvement of children and juniors.

We have structured this work on three parts that had as their starting point the following premises:

- achieving performance goals is not possible without objective, current and ongoing information on scientific bases;
- getting performance in soccer is the result of training in sports training, which must take into account the current requirements and features of the game;
- the optimal development of the motor qualities (combined and coordinating) specific to soccer players contributes decisively to their performance both in the training and in official games.

In the first part, "**Scientific demonstration of the research topic**" through the study of the specialized literature, we considered it appropriate to analyze and interpret the theoretical fundamentals supporting the scientific approach as well as highlighting the essential aspects that lead to the improvement of the motor reaction, creativity, imagination, analysis and decision making.

By documenting, assimilating a large amount of information on the physical, technical, tactical, psychological and theoretical characteristics of soccer, according to the goals and peculiarities of 11-12-year-old soccer players, we managed to accumulate and clarify a series of information and find out that there is no research to highlight the efficiency of using problem-solving, which has led us to conceive and to implement the strategy of organizing part II of the research **"Preliminary topic research".**

In the second part, through preliminary research, structured on two studies, we wanted to highlight the opinion and interest of the coaches (of children and juniors) and of the players regarding the use of the problem-solving method in the training process, but also the psychomotor possibilities of the 11-12-year-old players.

The first study aimed at:

- finding the coaches' opinion regarding the importance of problem-solving in the training of children and juniors, the degree of using the method in the training of children and the way of applying it within the training;

For the second study we have set as objective:

- the degree of involvement of children in the training process, the way of cognitive approach in certain circumstances imposed by the game development and the knowledge of the technical and tactical training of the children aged 11-12.

In our preliminary research we proposed to verify the following hypotheses:

- the use of the problem-solving method in the soccer training problems in soccer teams is different from coach to coach;
- the 11-12-year-old soccer players' awareness of information allows to approach the problem-solving method in the training process.
- the technical and tactical training level of the 11-12-year-old soccer players is different from one team to another and allows solving of the situations specific to the soccer game;

In order to achieve the objectives proposed in the preliminary research, we established that:

- the first study aimed at knowing the coaches' opinion on using the problem-solving method in training children and juniors, and how to apply them, a sample of 100 coaches belonging to the children's and junior clubs affiliated with Romanian Soccer Federation. After completing the questionnaires, 83 could be interpreted.
- the second study of a sample of 60 children aged 11-12 years belonging to the children's and junior centers of FC FCSB, AFC Sport Team and "Mircea Eliade" Sports Highschool.

As research methods we used the following: bibliographic study, observation, statistical-mathematical method, graphical representation and survey, which aimed to highlight the opinion of the soccer coaches regarding the use of the problem-solving at this age. The survey was materialized in a questionnaire addressed to coaches, which included a set of 10 questions.

In the second study we used 2 working tools:

- **the test / questionnaire** addressed to children for completion that highlights how players know how to meet a requirement to be resolved within a defined time (3 minutes).

- **the observation sheet** that recorded the technical and tactical elements and the individual and collective actions during the first 5 games of the municipal soccer championship tour.

As a result of the preliminary research we drew important conclusions regarding the use of the problem-solving method in the soccer game in 11-12 year-old children, which confirms the research hypotheses.

From the first observational type conducted by filling in a questionnaire by the coaches of the children's and junior centers, it is pointed out that *the use of the problem-solving method is used differently, limited and optional by the coaches in the process of training the children, which validates the first hypothesis.* On the other hand, it is considered to be, according to coaches, a very important and effective current method in the cognitive development of children with efficiently stimulating effects and other components of sports training, including a much wider applicability range.

The analysis and interpretation of the answers of the interviewed coaches highlighted the important role played by the problem-solving method in the training the 11-12-year-old players, as well as the need to organize the training using this method.

In the second study, the interpretation of the test / questionnaire filled in by the children demonstrates that *the information awareness according to the 11-12-year-old soccer players allows to approach the problem-solving method in the training process* which validates the second hypothesis.

The interpretation of the results obtained from the observation sheets of the competition performance shows that the *level of technical training of the 11-12-year-old soccer players is different from one team to another and allows the approach to solving the problem situations that arose in the soccer game* which validates the third hypothesis.

Appreciating positively these aspects of preliminary research, we consider that the problem-solving method is current, through the effects that it produces in the training process, but it must be used taking into account the particularities of children's development and the evolution of the soccer game.

In order to prove the above mentioned, we considered it necessary to plan and carry out the third part of the experimental research **"Improving the motor reaction in the 11-12-year-old soccer players after using the problem-solving method".**

The **aim** of the experimental research was to highlight the improvement of the motor reaction **in the 11-12-year-old soccer players after using the problem-solving method.**

The experimental research through which we are trying to bring a personal contribution to the development of the domain, **aims** to improve:

- the motor reaction in the 11-12-year-old soccer players by using the problem-solving method for 8 months;

- the technical, tactical and the motor level by using technical exercises in different ways for 11-12-year-old soccer players twice a week for 8 months;

- the players' spontaneous reaction following the use of the problem-solving method.

For the experimental research we have established the following hypotheses:

- using the problem-solving method in training contributes to improving the motor reaction in the 11-12-year-old soccer players;
- using the technical exercises in different ways for the 11-12-year-old soccer players twice a week contributes to improving the tactical and tactical level;
- using the problem-solving method in training improves the players' spontaneous reaction during the game.

In order to organize and carry out the experimental research, we considered it appropriate to set the following tasks:

- establishing the subjects participating in the experiment and the assessment events;
- applying the events and evaluation tests to the research subjects;
- preparation and implementation of the training program, using exercises specific to problem-solving in soccer with a role in improving the motor reaction to 11-12-year-old soccer players in the experimental group in order to achieve the purpose of the scientific approach;
- recording, processing, analysis and statistical interpretation of the results.

In order to accomplish our scientific approach, we applied the following methods in the experimental research: the bibliographic study, the pedagogical observation, the evaluation method, the statistical-mathematical method and the graphical representation, methods presented in the preliminary research. The newly used method in this research is the experimental method.

The two samples subjected to our research included a total of 40 players aged 11-12 years enrolled in the Municipal Soccer Championship organized by the Bucharest Soccer Association. The experimental team consisted of a total of 20 players belonging to the Steaua Bucharest S.A Soccer Club, and the control group, consisting of 20 players from the "Mircea Eliade" Sports High School.

The study was conducted over a period of 8 months. The place of experimental research was the sports base of the "Mircea Eliade" Sports High School as well as the UNEFS psycho-pedagogical laboratory where the initial and final testing were carried out.

The initial and the final testing of the experimental research consisted in applying tests and evaluation tests to highlight the motor response and the psychomotor potential in 11-12-year-old soccer players after using the

problem-solving method after the implementation of the program. In the two evaluations we used:

- a 8-measurement set and an index for somatic development (height, weight, body height measurement, span length measurement, biacromial diameter, bitrohanterial diameter, thorax perimeter, and Erissman index;
- a functional evaluation event (Ruffier event);
- 6 tests for motor skill assessment (10 m and 30 m running, vertical jump, bending of the trunk with extended arms, lifting the trunk from the dorsal decubitus, lifting the ventral decubitus trunk and 600-m-running endurance;
- 4 events to evaluate technical acquisitions (keeping the ball in the air in place with the foot, driving the ball on a predetermined track, pass precision, complex ball shuttle);
- 3 psychomotor parameter assessment tests (complex motor reaction test 1, motor reaction test and speed assessment, discriminatory reaction time test).

The applied intervention took place during the 8 months using 48 soccer-specific action systems in two of the three weekly training sessions, each of them being supported by means of intervention to improve the motor reaction.

To the same extent, in designing the systems, we have sought for them to make sense, to be accurately presented, to relate to the level of training already learned, to raise interest and to demand effort from the player. In this respect, we have developed the training plan so that the problem-solving method is involved through 3 action systems in each training session for this scientific approach.

The evaluation of the four sets of events and computerized psychomotor tests through which we intended to cover a larger area of the soccer training components gave us a relevant, synthetic and objective picture of the current training level of the 11-year-old soccer player -12 years.

The research hypothesis according to which that *the use of the problem-solving method in training contributes to the improvement of the motor reaction of the 11-12-year-old soccer players* was validated by the results obtained between the initial and the final test of the motor skills by the subjects of the experimental group, compared to the subjects of the control group.

The research hypothesis according to which *the use of technical exercises in different ways to 11-12-year-old soccer players twice a week contributes to the improvement of the technical, tactical and motor level*, was validated, supported by the results obtained between the initial and final testing in the functional event and the technical motor events by the subjects of the experimental group compared to the subjects of the control group.

The research hypothesis according to which *the use of the problem-solving method in training, leads to the improvement of the players' spontaneous reaction* was validated by the results obtained between the initial and the final testing in the psychomotor tests by the subjects of the experimental group compared to the subjects of the control group.

The confirmation of the hypotheses formulated in the research leads us to the following general conclusion:

The use of a training program oriented towards the principles of the problem-solving method, supported by the results obtained from the experimental research of their analysis and statistical interpretation, as well as the validation of the research hypotheses, contribute to the improvement of the motor reaction, the spontaneous reaction according to the requirements of solving the situational moments of the soccer game, as well as the improvement of the technical, tactical and motor kit of the 11-12-year-old player.

As a novelty in this preliminary research, in order to obtain the information necessary for the formation of an objective opinions on the problem-solving method, we considered it appropriate and efficient, the designing of some research tools such as: the questionnaire for the coaches, the test / questionnaire applied to the children and the game observation sheets.

A personal contribution is the conception of control events outlined according to the basic principles of the problem-solving method, adapted to the needs and requirements of the soccer game.

Another element of originality of our scientific approach is the elaboration of an operational training program that complies with the training particularities of the problem-solving method in order to improve the motor reaction of the 11-12-year-old soccer players.

Therefore, the design of the problem-based training process is authentic and triggers a real interest from the coaches and research subjects who have experienced this new form of training, being pleasantly surprised by the content and diversity of the action systems offered by this method.