ASSESSMENT OF ACTIVIZATION OF THOUGHT PATTERNS OF FOOTBALL PLAYERS IN A COORDINATED ACTION THAT ENDED IN SCORING A GOAL

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Abstract

Teaching football should not be focused exclusively on students' physical or locomotor skills, it should also develop their thinking processes. This fact comes as a result of cooperation of football players during a match, which requires anticipation and making right decisions. The process of intellectual training is often outlined by coaches, but in a regular training it is often not discussed in detail, since not many studies confirmed its importance. In the paper the level of thinking of players during cooperation in scoring a goal was discussed as well as modeling of the game using means of intellectual training. The observation of player cooperation included the analysis of 141 goals scored in 76 randomly selected football matches in UEFA Champions League from 2005 to 2019. In the study the method of noted observation was used, the subject of the study could be observed many times. The actions were observed due to the level of thinking processes. The analysis of the results shows that cooperation of the players in order to achieve the ultimate offensive objective of the game requires intentional actions based on thought patterns. These patterns taught in the training can guarantee not only anticipating in the realization of common tasks, but also making decisions that are best for the effectiveness of the game.

Keywords*: game synergy, thought patterns, intellectual training, game observation*

Introduction

Effective training in any sport is based on using means and forms of teaching that possibly accurately reflect the natural conditions of the game. To do game modelling it is thus necessary to properly recognize conditions of all actions in a game. One of means to do that is an observation, which as elementary method of knowing, is based on purposeful, directed and regular perception of a given subject, process or phenomenon(Soroka & Lago-Peñas, 2016). Based on a definition of a sports game(Duda, 2008; González Víllora, García López, Gutiérrez Díaz, & Pastor Vicedo, 2013; Naglak Z, 2005; Panfil, 2006) one can notice that the actions of players are not only locomotor, but most of all they are intentional and they require not only good locomotor preparation but also particular activization of thinking processes (internal action), which due to the necessity of making right decision is the main element of the process of effective external action (Fig. 1)

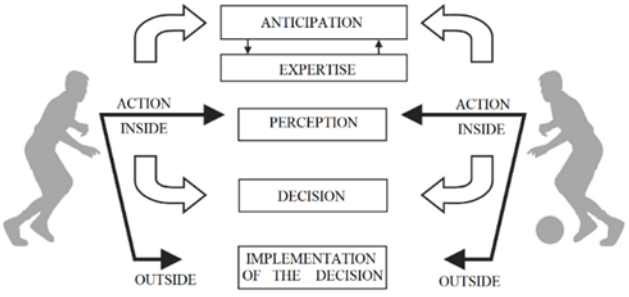

Figure 1. The process of player's actions

It is a result of the above that the efficiency of an action is a regular perception, processing and generation of information in various situations of a sports game(Pearson P, Webb P, 2008). It seems that this process has a significant meaning not only for player's individual actions but also for cooperation – acting in a group.

According to Duda (2008) group action is a game synergy based on actions of several players (number given by rules of a specific sport), solving tasks collectively and cooperating in order to achieve their

purpose. This group is a whole, where each of its members acts in their specific range which results in mutual dependance of players roles. Their actions are multitasking, so actions of each player have impact on actions of their co-players (Naglak Z, 2005). In a group action a player should be able to understand the relations between them and their partners. They should not only know how to act individually in a given situation but also realize the possibilities of actions of their partners and rivals. According to Naglak(2005) this is necessary to use tactical actions, when a player is not only able to realize his plans but he can also consciously and intentionally coordinate his actions with actions of his partners. He can notice all kinds of mistakes: own, partners and rival's and learns how to avoid them. Duda (2008) assumes that possibility of predicting efficiency of a group actions in a game is a function of individual skills of players and it connects individual skills into group skills. It seems that these factors are based considerably on understanding the game (knowledge of the game, effectiveness of thinking processes, decisiveness), hence one can assume that it is easier to reach the goal when individual actions of players are intentionally and rationally combined into group action, which depends on the level of cooperation of the players (González Víllora et al., 2013).

A competitor in a group is insofar its part as he realizes actions on its behalf. When every member of the group highly commits themselves to reach the game's goal a synergic effect occurs. Synergy in a team sport is an equifinal system of dependent effects facilitating (facilitation) or enabling (organization) reaching the game's goals. Above mentioned types of synergy are elements of so called external synergy. Its occurring is determined by individual predispositions of the players, mutually dependent and creating equifinal systems of synergistic predispositions (internal synergy)(Panfil, 2006). Assuming that team sport is a sequence of differentiated situational action, both individual and group one, one can try to define the structure of these actions. Taking into account various levels of cooperation (pre-emptive, concurrent, follow-up) (Panfil, 2011) one can try to characterize it due to level of intentionality in the realization of the main offensive aim of the game. Learning this relation in multitasking actions (character of the game) can facilitate the process of rational steering the players in a team sport game.

The objective of the game is to assess the level of absolutely dependent cooperation (synergy) in a team sport game in various situations and its influence on scoring a goal.

There are the following study questions:

-Does the efficiency of the main offensive aim (scoring a goal) depends on the level of synergy of the players?

-Does the level of conflict of a sports aim in a game depends on the involvement of the creative player?

Conjecture:

Actions that lead to scoring a goal in a football game need efficiency based on a creative way of solving a movement problem due to high level of conlfict of a sport aim.

Methods

In the paper a detailed observation of players' actions towards scoring a goal was made. The analysis included 141 scored goals in randomly selected 76 matches in UEFA Champions League from 2005 to 2019. The study analysis included using films recorded on DVD, so players' actions could be watched repeatedly(Anderson & Sally, 2013; Panfil, 2006). An observation sheet was used, all noticed facts, events, and circumstances were marked under each observation parameter (Łobocki, 2003)(Fig. 2)

		the level of the competition: UEFA Champions League			
		teams and result of the match: Chelsea : Real Betis 4:0			
type of coordination goals		pre-emptive	concurrent	follow up	type of situation
1		X			risky
2			X		uncertain
3			X		risky
4		X			uncertain
Sum	4	2	2	0	

Figure 2. Observation sheet showing game characteristic in offensive cooperation

Study observation included the assessment of absolutely dependent cooperation, which, according to Panfil (2006), Duda (2008) and Castellano et al. (2012) concerned the following various levels of coefficients of players' cooperation :

-Pre-emptive coordination (KW) – situation when a subsequent dependent action is done pre-emptively, e.g. beginning of the subsequent action takes place in the last phase of the preceding one, before its ending.

In the observational analysis positive action was defined as a situation when the scoring player did a "freeing" movement, moving into favorable position

in the last phase of partner's action (before its end) that created opportunity to pass the ball.

- Concurrent coordination (KR) – situation when the dependent actions take place simultaneously, e.g. the subsequent action starts at the moment when the preceding one ends.

In the observational analysis positive action was defined as a situation when the scoring player did a "freeing" movement, moving into favorable position simultaneously with the end of his partner's action (the partner who created the opportunity to pass the ball).

- Follow up coordination (KN) – situation when a subsequent dependent action follows the action of the partner, e.g. beginning of the subsequent action depends on the result of the previous action.

In the observational analysis positive action was defined as a situation when the scoring player did a "freeing" movement, moving into favorable position at the moment when the partner has already a possibility to pass the ball.

In the study process the above mentioned actions were done by professional referees, chosen with the use of Delphi method and they analyzed the goals in three particular situations:

- Certain – when the number of forwards was greater than the number of defenders,

- Uncertain – when the numbers of forwards was equal to the number of defenders,

- Risky – when the numbers of forwards was smaller than the number of defenders.

To answer study questions and to verify the conjecture the following computations and statistical methods were used:

Basic statistical parameters were used in the study: arithmetic mean, standard deviation, coefficient of variation as well as the level of significance of differences in t-Student test (Arska - Kotlińska, Bartz 2002).

Results and discussion

In the study the analysis of the methods of cooperating of players in order to score a goal was made. In order to meet the conditions of praxeology of the game, not only the locomotor actions of players were characterized, but most of all they were classified due to the level of intentionality and the objective of realized task. Aspects of these assumptions required not only great locomotor skills, but most of all strong intellectual commitment (reading of the game, understanding partner's intentions). Assessment of the method of realization (type of cooperation, type of situation) of the ultimate offensive aim of the game was based on difficulty of actions. It was assumed that the effect of scoring a goal underlines the aspect of a study goal. This assumption could reduce study effects (getting into a scoring position could be equally correct), however for the study goal (detailed recognition due to type of cooperation and type of situation) it will facilitate to recognize the level of intentional action.

In the presentation of the study firstly the assessment of the analysis of actions ending in scoring a goal in certain situations, where forward players dominated defenders. In observed games this actions resulted in 35 goals (Tab. 1) including 8 goals (22.9%) after actions with follow up coordination, 10 goals (28.6%) after actions with concurrent coordination and 17 goals (48.5%) after actions with pre-emptive coordination.

Table. 1 Number of goals scored with respect to coordinate actions in certain situations

Parameter	Type of coordination		
	pre-emptive	concurrent	follow-up
Goals	17	10	8
%	48,5	28,6	22,9
Total	35		

The analysis of the presented data for actions in easy situations shows that actions with follow up coordination, which in opinion of Panfil (2011) in a small extent use process of anticipation, were the least often (Fig. 3)

Statistical analysis (Tab. 2) shows that the significant differences of values regard only the comparison between pre-emptive and follow up coordination. The analysis of the coefficient of variation shows that goals scored in easy situations were mostly scored with the pre-emptive and concurrent coordination. One can say that majority of the goals scored in easy situations (77.1% - Tab.1) were scored, confirming Naglak (2005) and Panfil (2011) claims, when players had high level of anticipation of partners' actions. This shows that even in easy situations efficiency of players actions requires a good level of mental commitment (González Víllora et al., 2013; Wein, 2007).

Table. 2 .Statistical values of scored goals with respect to type of coordination in certain situations

		type of coordination		
		pre-emptive	concurrent	follow up
mean		0.47	0.28	0.25
standard deviation		0.51	0.45	0.44
coefficient of variation		107.22	163.53	175.66
level of significance	KW-KR	0.114		
	KW - KN	0.042*		
	KR - KN		0.302	

*p < 0.05

The next analysis regarded types of cooperation of players in uncertain situations. These were the goals scored when the number of defenders was greater than the number of forwards. In observed games in such situation 40 goals were scored (Tab. 3), 8 (20%) was scored after actions with follow up coordination, 15 (37.5%) was scored after actions with concurrent coordination and 17 (42.5%) was scored after actions with pre-emptive coordination.

Table. 3. Number and percentage of goals scored with respect to coordinate actions in uncertain situations

Parameter	Type of coordination		
	pre-emptive	concurrent	follow-up
Goals	17	15	8
%	42,5	37,5	20
Total	40		

The analysis of the presented data for actions in uncertain situations shows that actions with follow up coordination, which in opinion of Panfil (2011) in a small extent use process of anticipation, were the least often.

Statistical analysis (Tab. 4) shows that the significant differences of values regard the comparison between pre-emptive and follow up coordination as well as concurrent and follow-up coordination. This fact shows clear domination of pre-emptive and concurrent coordination over follow-up in scoring a goal in uncertain situations. The analysis of the coefficient of variation shows that goals scored in uncertain situations were mostly scored with the pre-emptive and concurrent coordination. One can say that majority of the goals scored in uncertain situations (80% - Tab.3) were scored, confirming Naglak (2005) and Panfil (2011) claims, when players had high level of anticipation of partners' actions. This shows that even in easy situations efficiency of players actions requires a good level of mental commitment(González Víllora et al., 2013; Wein, 2007).

Tab.4 Statistical values of scored goals with respect to type of coordination in uncertain situations

		type of coordination		
		pre-emptive	concurrent	follow-up
mean		0.44	0.37	0.20
standard deviation		0.50	0.49	0.40
coefficient of variation		114.44	133.29	205.62
level of significance	KW - KR	0.252		
	KW - KN	0.008**		
	KR - KN		0.043*	

The last analysis regarded types of cooperation of players in uncertain situations. These were the goals scored when the number of defenders was greater than the number of forwards. In observed games in such situation 66 goals were scored (Tab. 5), 10 (15.1%) was scored after actions with follow up coordination, 22 (33.4%) was scored after actions with concurrent coordination and 34 (51.5%) was scored after actions with pre-emptive coordination.

Table 5 Number and percentage of goals scored with respect to coordinate actions in risky situations

Parameter	type of coordination		
	pre-emptive	concurrent	follow-up
goals	34	22	10
%	51,5	33,4	15,1
Total	66		

The analysis of the presented data for actions in uncertain situations shows that actions with follow up coordination, which in opinion of Panfil (2011) in a small extent use process of anticipation, were the least often. (Tab.5)

The analysis was confirmed by statistical computations (Tab. 6) that show clear domination of actions with pre-emptive and concurrent coordination among all actions in risky situations. The analysis of the coefficient of variation also shows that that goals scored in easy situations were mostly scored with the pre-emptive and concurrent coordination. One can say that vast majority of the goals scored in risky situations (84.9%) were scored, confirming Naglak (2006) and Panfil (2011) claims, when players had high level of anticipation of partners' actions. This shows that even in easy situations efficiency of players actions requires a good level of mental commitment (González Víllora et al., 2013; Wein, 2007).

Table. 6. Statistical values of scored goals with respect to type of coordination in uncertain situations

		type of coordination		
		pre-emptive	concurrent	follow up
mean		0.57	0.31	0.13
standard deviation		0.50	0.48	0.31
coefficient of variation		87.73	152.96	283.23
level of significance	KP - KR	0.026*		
	KP - KN	0.001***		
	KR - KN		0.008**	

*p < 0.5, ** p <0.01, ***p < 0.001

In the game description it is important that the observed actions were significant for reaching the goal of the game as well as the actions were on a high sports game level. Meeting these criteria guarantees correct modeling of the game. In this study the analysis of the game on a championship level was made, the ways of players' cooperation in order to score a goal were also characterized. Thus it seems the necessary conditions for objectivization of the praxeology of the game were satisfied. When characterizing the types of cooperation of the players in order to reach the ultimate offensive aim of the game – scoring a goal, one can try to answer the following study questions:

-Does the efficiency of the main offensive aim (scoring a goal) depends on the level of synergy of the players?

-Does the level of conflict of a sports aim in a game depends on the involvement of the creative player?

These questions asked in the process of training seem to be significant and justified, they try to find out the problem of effective action in the aspect of internal and external synergy in a sports game. These actions require high level of efficiency of thinking processes Panafi (2006), hence it seems that in a mass of common training in team sports, where mechanical and habitual behavior dominates other aspects (Duda, 2008) these actions allow to find a way or a pattern for an effective sports game(Hughes & Bartlett, 2002). The study showed that in a sport game the most important actions are those that are based on intentional behavior that require operative thinking(González Víllora et al., 2013), hence training should be based on conscious actions involving thought patterns in the process. Continuing the direction one can try to define group actions. Based on the process of players' synergy one can try to define the levels of cooperation, which, according to Panfil, are based not only on the difficulty of the tasks, but most of all they made an attempt of classifying the players' cooperation due to the level of anticipation(Panfil, 2011). This aspect was assessed in certain, uncertain and risky situations, where thinking process can dominate actions on a different level (Duda, 2012).

The obtained study results unambiguously show that in all types of situations (certain, uncertain and risky) the efficiency of cooperation requires high level of synergy(Naglak Z, 2005). In this study the justification of this claim was illustrated with the percentage coefficient for the efficiency of goals scored in some situations in a game. These actions require not only high level of efficiency in external action, but most of all internal action based on anticipation and effective perception(McGarry, 2009; Naglak Z, 2005; Rajkumar Bauri, Mrityunjay Biswas, 2016). One can draw a conclusion that in order to cooperate better the players have to not only understand one another, but most of all they should understand the game – have a knowledge about it which can in a great measure facilitate decision making process in a sports game (Mandigo, Ph, Butler, & Hopper, 1982). This rule shows directions for organized training, it shows the importance of thought patterns for creative actions of a player. In this aspect it was proven that the creativity of the player is a necessary condition for a masterful realization of the goal. In the praxeology of the game we fully recognize athlete's actions: not only motor variables, but also (which is very important to the game) the intentional variables.

Conclusion

1. High level of synergy that requires mental commitment of a player for anticipating results of game's tasks is the most important in the realization of the ultimate offensive aim of the game.

2. The greater the difficulty of situational taska in a game the greater the level of synergic actions of players.

3. Due to multitasking character of a team sport the process of player's training should develop also his thought patterns, engaging his thinking processes for making right decisions.

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