INFLUENCE OF CREATIVE INFORMATION TRANSFER ON THE PERFORMANCE OF FOOTBALL PLAYERS

Henryk Duda 1 ABCDEFG Mateusz Kaczor 1 ABCDF

1 Faculty of Sports and Recreational Games, Sports Institute, University of Physical Education, Krakow

Key words: football, creativity, information

Abstract

Study aim. The increasing level of sporting achievements is the reason for seeking new and different solutions in various areas of the training process. Therefore, it is aimed at enriching training content with new methods, forms or introducing more effective organization of training classes. It should be assumed that the way to improve training effectiveness consists in combining developmental activities: motor skills, special motor abilities and mental abilities [1, 2]. Among these athletic qualities, considerable reserves are recognized in the teaching-learning of special motor activities and tactics in which athlete’s mental abilities are utilized. Hence, by looking for new ways to optimize the training process for players, attention is drawn to a problem that until recently, was unpopular in sports learning, the relevance of which is systematically increasing, i.e. the need for intellectualization of the training process.

Basic procedures. Demonstrating the influence of conscious analysis of a movement task among football players on their performance and on the basis of the importance of thought processes for the efficient performance of movement tasks determining directions for creative teaching of the sports game as an effective way of teaching technical and tactical activities.

The test group comprises football players in three age categories:
• Youngsters (U-12)
• Juniors (U-16)
• Seniors

In the research process, the creative method is applied to creative exercises [3, 2] based on the conscious analysis of the motor activity.

Results. The analysis of the research results shows that creative teaching learners achieve better results in movement performance.

Conclusions. 1. Efficacy of motor activity requires understanding of causal relationships. 2. Mentalization of the training process increases the effectiveness of the players’ movement.

Introduction

The increasing level of sports achievements is the reason for searching for new solutions at various levels of the training process. Therefore, we strive to enrich the training content with new methods, forms or to introduce more effective organization of training activities. It should be assumed that the way to improve the effectiveness of training is to combine activities developing: motor skills, special movement skills and mental abilities [1]. Among these characteristics of athletes, significant reserves are seen in teaching-learning special movement activities and tactical actions, utilizing the mental abilities of athletes. Therefore, looking for new ways to optimize the training process of players, attention is paid to the until recently unpopular issue in learning sports games – the
importance of which is systematically increasing – i.e. the need for intellectualization of the training process, which develops a player's creativity in a unique way [4]. It requires the involvement of awareness and independent, creative thinking of the players in the process of teaching them. Adoption of such a direction in organized player training seems to be a necessity, because a sports game - as a multi-entity operation, is a dependent competition, the essence of which is to resolve conflicts of player rivalry to one's advantage via any deliberate and purposeful actions [1]. Efficient operation during the game requires optimal functioning of the central nervous system, which plays a fundamental role in the transition from reflexive behaviours to conscious (conceptual) actions [5]. It should be borne in mind that the finalization of an external (manipulative) activity – the manifestation of motion is the end product which is preceded by an internal action – is the basis for external action.

Thus, the player, wanting to efficiently perform actions in changing game situations, must have the ability to predict the consequences of events (anticipation), i.e. the possibility, occurrence or non-existence of a favourable or unfavourable situation in the future. Effective prediction of events significantly depends on knowledge resources regarding the ways of acting in different game situations.

The further mental process in the player's effective operation is the ability to quickly perceive events and recognize them accurately. This process is called perception and concerns "active reception, analysis and interpretation of sensory phenomena in which currently incoming information is processed on the basis of knowledge about the surrounding world recorded in one's memory" [6-p90]. The player's specialist knowledge combined with the experience acquired during competitions, leads to the improvement of specific perception, enabling effective action in dynamic, constantly changing game situations. According to Naglak [7], without knowledge (information about the action), a player is deprived of "materials" needed for thought processing. Perception is manifested in rapid adoption, processing and evaluation of information relevant to the course of the game via sensory organs, especially sight and hearing [8]. The perception of the situation is based on thinking, the mental activities concerning understanding, prediction, assessment and reasoning.

The player, being in dynamic game situations, strives to achieve the intended goal via the performance of conscious actions by making decisions. The player makes his/her decisions based on the information coming from the game infield in terms of the purpose of the action, experienced emotions, which means that decisions can be both effective or ineffective, neutralizing the favourable state of the game [7]. If, during the game, the player consciously solves the tasks in accordance with the knowledge of the set goal, this means that s/he knows "what to do" – we can say that s/he acts tactically. This also means that s/he maps the set of decisions from a set of situations and then, makes a selection that solves the task according to its purpose. It should be noted that specialist knowledge is the basis for the internal action programme, where in the analysis of events in the player's mind, there is an operational plan of movement activities, which (as already mentioned) is manifested in external action, e.g. in manipulative or locomotive activities, i.e. external action.

Therefore, it can be considered that in multi-entity activities, in a well thought through manner, the player creates an alternative solution to the movement task in the game based on the action programme coded in his/her mind.

According to Naglak [1], the sooner a programme of activity arises as a result of mental activities, the better the player has a chance for external action – movement, which includes movement with the ball – manipulative (called technique) and game-specific movement of the player (known as directed technique). The player's external actions, however, make sense only when they are used to perform a specific task for a specific purpose, hence, internal action is closely related to external action because it a closed psychomotor system is mutually effected [9]. The information above clearly indicates that the player's performance is saturated with a high factor of purposeful actions, hence, the training process must be based on mental teaching. According to Naglak [1], this is a way to teach movement activities, where the uncontrollable behaviour of an athlete is replaced by intellectual or rational, mental control. This process is about conscious reception of movement activity stimuli, i.e. movement perception – based on thinking. Mental control is also needed to familiarize the player with effective rules in action and to set out practical directives providing a player with what s/he needs to do in specific game situations in order to effectively achieve a goal. Such activities regard transferring knowledge about efficient action, on the basis of which the player makes alternative decisions in a conscious and purposeful manner. The point here is to provide didactic instructions regarding movement activities that would trigger a player's state of conscious and creative attitudes, causing creative action. In sports game conditions, this means [7]:

- purposefulness of actions (to whom - when - how to pass the ball),
- awareness of actions (the player knows what s/he is thinking and what moves to make),
- freedom of action (variety in using simultaneous combinations of movements).

Taking this into account, experimental solutions were undertaken in the process of mental control of the player.
An attempt was made to demonstrate how mental impact affects the performance of a motor activity. Correlations were sought for creative transfer, which in the assumptions of the research objectives, was done to determine the influence of thought processes on the efficiency of movement activities of players at various levels of training (children, adolescents, adults). In hypothetical deliberations, it is believed that better recognition of the mental sphere can significantly increase the effectiveness of player preparation in organized training.

**Study aim**

The research issue refers to intellectualization of the training process in sports games. These issues in the theory of training are quite widely known, but in practice, they are treated as a "slogan". In present training, the mental sphere is still underestimated in the player control process.

The aim of the study is to show the influence of conscious analysis of a motor task among footballers on the efficiency of their performance, and on the basis of the importance of thought processes in the efficient performance of movement tasks, setting directions for creative teaching in sports games as an effective way of teaching technical and tactical activities. These research problems are innovative because demonstrating the importance of thought processes for efficient operation and the indication of directions of control and shaping these processes in specialized creative exercises may not only modify the current concept of teaching methodology in sports games, but also significantly improve the process of training players in sports and pro-health aspects.

Taking this into account in the research procedure, the following research questions were posed:

1. Does the process of mental control have a positive effect on a player’s performance?
2. Is training experience decisive in the effectiveness regarding the reception of creative instruction?
3. What parameters should be included in the methodology of shaping creativity for sports games?

**Research hypotheses:**

1. The conscious participation of a player in movement activity increases the effectiveness of carrying out the objective of the game.
2. The development of creativity in sports game players requires specific selection of measures taking analysis of the situational character of an action into account.

**Study material and methods**

The study group comprised randomly selected football players from three age categories:

- Youngsters – 1st county league (32 individuals)
- Juniors – Inter-Voivodeship league (32 individuals)
- Seniors – 4th and 3rd league (32 individuals)

A total of 96 football players were examined in so-called continuous research, which was conducted in 2012–2017. In the organized selection (homogeneous groups in movement action skills), they were divided into an experimental and control group (50% of individuals in a given age category).

In the research process, the creative method along with didactic creative instructions were used in the perfor-
formance of movement actions [3, 10], based on their conscious analysis. The making of greatest importance for a future championship regard the ability to score points. The player’s attitude towards scoring points makes him/her active (mobile), so s/he is constantly looking for opportunities to achieve the objective of the game. In turn, the biggest difficulty in achieving the game objective is to obtain points (goals, baskets) [1]. Taking this into account, the selection of the task in the implementation of the research objectives concerned the nature of the movement activity and the goal of the game, hence, the choice of action included the objective of the offence game – goal scoring.

In the research, the so-called test of creative activities – movement test was used, which included supporting activities (not subject to evaluation): ball reception, slalom sprint and the main action (subject to evaluation), i.e. the effectiveness of kicking the ball into the goal in the presence of the goalkeeper (scoring a goal). Relevance of the test used is r = 0.89 [10]. This value, according to Brzeziński’s assumptions [11], meets the requirements for experimental research.

The test was carried out in the penalty area of the football field (Fig. 1), where the participating players performed the action in a designated sector at a 45 degree angle, the peak of which is at the midpoint of the goal.

In this sector, the following were designated:

• the area of goalkeeper’s action in which s/he moves along the bisector of the angle from the goal line towards the corner of the goal area (section length: 6 m); at this height, the goalkeeper assumes a passive defensive position (RH, right hand – to the side, LH, left hand – covering the face) - for actions on the left side of the goalpost.

• the area of action of the tested player, who is in the designated sector, in the zone between 8-7 m (distance from the end line of the goalkeeper’s sector); in movement activities, s/he has to perform an effective kick towards the goal.

When the striking player passes the starting line in his/her sector, the goalkeeper was able to perform only one intervention: a defensive exit with passive defensive position (Fig. 1). In defensive actions (goalkeeper-striker), there was no direct contact. The strictly defined intervention of the goalkeeper in repeated attempts fulfilled the condition of “identical event” [10]. The test participant (the striker), exceeding the starting line of his/her sector of activity, was to achieve the objective, i.e. score a goal. This activity was rated as positive (scored goal) or negative (no goal scored) [12]. Earlier, the striker during a specified part of the test, in reception of the ball, introduces it into the action sector. These activities are not evaluated, they are only so-called activities adaptive to operation.

The instruction – “observe the goalkeeper – strike effectively”, was based on effective action directives (detailed explanation before the given “queue of kicks” included: evaluation of the situation (positioning the goalkeeper, analysis of his/her movement), the moment and way of striking the ball (distance from the goal, angle of attack, strength of impact, technique of impact)).

These activities were aimed at activating the mental sphere of the player in this activity. In the research activities, confirmation of the fact that mentalization and activation of the mental sphere in action took place, is the value of the differentiation of results obtained in two homogeneous groups (E and C) in the first and second tests. To compare the obtained results, basic statistical calculations were performed: standard deviation, arithmetic mean, and the Student’s t-test will determine the significance level of differences [13]. Verifying the hypotheses, a significance level of $p < 0.05$ was assumed.

**Study results**

Undertaking research in the assessment of the didactic effect of creative instruction on the efficiency of movement activity among the tested players, an attempt was made to answer the question: does the transfer of creative information favourably affect the efficiency of movement? In order to answer the question posed, in the experimental procedure, the evaluation of the players’ performance was subjected to research analysis, the performance of which required not only skills in motor activities but, above all, conscious analysis for the performance of a movement task. According to Szewczuk [14], Panfila [12] and Duda [15], such a psychophysical state is readiness to act effectively when carrying out a specific type of task, with the possibility of adapting to changing conditions. Taking this into account in the selection of actions in the research procedure, it was necessary to perform such a task that would require not only great emotional engagement (goal scoring), but above all, a high level of thought advancement (creative activity). Such an assumption results from the operational goal of educating a player [4], which assumes that effec-
tive action in achieving the objective of the game requires not only appropriate movement skills but also an optimal emotional attitude (willingness to perform exercise) and, above all, conscious motor control (internal action) [1]. Therefore, for research purposes, this was based on the performance of a task, which concerned carrying out the highest objective in offensive operation, i.e. scoring goals [12]. These activities took the requirements for creative action into account, i.e.: solving the movement task, maximally similar circumstances to playing conditions and a practical directive on the effectiveness of the task - but with the option of choosing decisions on how to act. In order to successfully perform the entrusted tasks in the experimental study, the player had to assume a creative attitude in action. Also, the specific objective of the task (scoring a goal) was the motivational factor (willingness for self-evaluation) in achieving the highest aim of the game in offensive action.

Thus, the experimental task in the study required a creative attitude, because its participants, based on effective guidelines in action, independently influenced the course of implementing the set goal. Analysing the results of research within the aspects of intellectual control of the players' physical activities, the rational values of the effectiveness of goal strikes were performed in the first attempt of the experiment (so-called habitual action) – the 1st examination.

These activities were conducted in two experimental and control groups for players in three age categories: youngsters, juniors and seniors (Table 1-3).

The selection of players for three categories was aimed at determining the impact of creative information, assessing the level of mental control depending on age, experience in action and the level of habitual movement development in the player's action. In the research assumptions, analysis of the players' activities not only determines the level of transfer of creative instructions to smooth action of the player, but it additionally determines the degree of a player's vulnerability to intellectual control.

Analysing the first test conducted in three training groups of football players' (youngsters, juniors, seniors), it should be noted that in the spontaneous, so-called "habitual" action in selected groups, no significant changes were found in activity. The obtained values do not show differentiation on a statistical level (Tab. 1-3). For research purposes, such a state is advantageous, as it indicates regularities in the selection of random and targeted samples for the groups studied in the conducted experiment [16].

Interesting research results can be noticed during the second examination (Tab. 1-3). Analysis of data shows that the impact of creative instruction transfer is significant (has statistically significant value) and occurs in three training categories. This fact confirms not only the significance of mentalization in the player's process of action but also indicates that this process is carried out at every stage of training.

Significant relationships can be observed when analysing the results obtained for the first and second tests in the studied groups. In the detailed analysis of this process, it can be noticed that for the youngster category, there is a low level of established motor behaviours [17]. It seems that the youngest of the surveyed groups were willing to analyse the situation (the highest goal rate). In the junior and senior categories, these values were slightly smaller (the 1st test), and also in the second study, it can be seen that the score rate in the juniors and seniors was slightly lower than in the youngster group. This statement is surprising, because it may indicate that professional training weakens the effectiveness of movement. However, in deeper analysis of the achieved

<table>
<thead>
<tr>
<th>Table 1. Differentiation values in the creative test of the player's activities for the first level of research – the &quot;youngster&quot; category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Examination I</strong></td>
</tr>
<tr>
<td>Arithmetic mean</td>
</tr>
<tr>
<td>Standard deviation</td>
</tr>
<tr>
<td>Coefficient of variation</td>
</tr>
<tr>
<td>Significance of differences between groups</td>
</tr>
<tr>
<td><strong>Examination II</strong></td>
</tr>
<tr>
<td>Arithmetic mean</td>
</tr>
<tr>
<td>Standard deviation</td>
</tr>
<tr>
<td>Coefficient of variation</td>
</tr>
<tr>
<td>Significance of differences between groups</td>
</tr>
<tr>
<td>Level of significance between examination I and II in the given group</td>
</tr>
</tbody>
</table>
experimental effects, it seems that we are dealing with
the process of shaping a physical habit, closed off when
not using a creative training method, which together with
the training experience (older groups: especially the se-
nior group, where the lowest values for the second exam
were also obtained), can be solidified. This process is
unfavourable for sports games [1], as it can consoli-
date the mechanical ways of performing actions. The
obtained effect in the experimental study is consistent
with the studies by Basiaga-Pasternak [18] and Birch et
al. [17], who confirm that in children, due to the lack of
formation of motor habits, there are large reserves for
the transfer of perception.

According to the goals of experimental research, we
also see interesting results in the second study, in
which creative instruction was used in the experimental
group (Table 1–3). The analysis of data shows that in
the three studied groups: youngsters, juniors, seniors
(children, adolescents, adults), a characteristic pattern
was observed in the experiment. Statistically significant
differences were obtained for experimental groups. This
fact indicates that there is a high level of transfer for
creative instruction that measurably translates into the
effectiveness of performing a task in the action of a foot-
ball player. It seems that such a state results from the es-
sence of sports games, in which the situational nature of
a game requires conceptual action (perception, analysis,
decision) [1]. Also within the concept of experimental
research, the essence of creative information transfer
was sought. It seems that the state of mental stimulation
seems to be most important in this aspect [4], where it
has been proven that in motivation to act in the game,
a creative attitude can have significant impact on a play-
er's effectiveness. Also, the transfer of knowledge about
the operation – which was characterized by the applied
experimental activities – could significantly affect more

Table 2. Differentiation values in the creative test of the player’s activities for the first level of research – the “junior” category

<table>
<thead>
<tr>
<th></th>
<th>Examination I</th>
<th>Control group</th>
<th>Experimental group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic mean</td>
<td>2.13</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.64</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>30.00</td>
<td>32.73</td>
<td></td>
</tr>
<tr>
<td>Significance of differences between groups</td>
<td>1.08</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Examination II</th>
<th>Control group</th>
<th>Experimental group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic mean</td>
<td>2.53</td>
<td>3.07</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.52</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>20.38</td>
<td>14.93</td>
<td></td>
</tr>
<tr>
<td>Significance of differences between groups</td>
<td>3.53***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of significance between examination I and II in the given group</td>
<td>2.18*</td>
<td>5.48***</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Differentiation values in the creative test of the player’s activities for the first level of research – the “senior” category

<table>
<thead>
<tr>
<th></th>
<th>Examination I</th>
<th>Control group</th>
<th>Experimental group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic mean</td>
<td>1.99</td>
<td>1.96</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.87</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>28.38</td>
<td>29.14</td>
<td></td>
</tr>
<tr>
<td>Significance of differences between groups</td>
<td>0.782</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Examination II</th>
<th>Control group</th>
<th>Experimental group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic mean</td>
<td>2.16</td>
<td>2.52</td>
<td></td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.75</td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>22.47</td>
<td>16.85</td>
<td></td>
</tr>
<tr>
<td>Significance of differences between groups</td>
<td>2.11**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of significance between examination I and II in the given group</td>
<td>1.17</td>
<td>2.74**</td>
<td></td>
</tr>
</tbody>
</table>
Influence of creative information transfer...

effective performance of tasks in the player’s operation for the experimental group. In this aspect, Superlak [19], Duda et al. [2] and Duda and Bryski [20] may confirm this status, verifying the importance of knowledge in the smooth performance of a player in sports games. Taking the results above into account, it can be stated with great certainty that mental processes are of great importance in the actions performed during a sports game. However, in order to fully carry out the objectives of research, which may significantly confirm the importance of thought processes in effective multi-entity operation (the level of creative information transfer), comparison of the test results in the control and experimental groups was conducted for the first and second tests.

From analysis of data contained in Tab. 1–3, it can be seen that similar values were obtained in all study groups. In the control groups, a low increase in the effectiveness of activities was noted, while in experimental groups (for all age categories), a significant increase was obtained - statistical significance was at a high level. These regularities underline the significant importance of mentalization in the processes of sports game operation. These results are consistent with earlier studies among volleyball players [19], handball players [21] and footballers [21]. These facts clearly confirm that mentalization in the process of training for sports games is significant, hence, taking into account its importance, it should particularly be considered in the training process, not only for older players but also the youngest who have a high-level knowledge acquisition about the game. These activities undertaken for effective training should include not only creative training measures [4], but they should also shape the player’s reflexivity in practice (analysis, alternative decision-making, self-assessment) [15].

The obtained research results emphasize the essence of sports games, which are of tendentious actions in nature [9]. Indeed, multi-entity type activities must be carried out deliberately. Research observations also confirm the didactic appropriateness that should apply to learning the game. This regularity indicates that if the game is to be learnt effectively, one should first learn when and how to act, and then what motor skills to use for these purposes [1]. Considering the fact that the intellectualization of the teaching process in sports games regarding the everyday training of a player is treated as a “slogan” [7, 12, 15], the research carried out, confirming the importance of mentalization in training, strengthens the essence of this issue, appointing the direction of effective activities in the process of teaching sports games.

Conclusions:

1. The effectiveness of movement activity requires understanding of cause-and-effect relationships.
2. Mentalization of the training process increases the effectiveness of players’ movement activity.
3. Mental processes in movement activities should be developed and shaped at all stages of a football player’s education.
4. Due to the equivalent nature of action in team sports games, reserves in the sphere of players’ mental disposition should already be sought out from an early age.

References:

[12] Panfil R: Prakseologia gier sportowych, Studia i Monografie. AWF Wrocław, 2006; 82.

Author for correspondence:

Henryk Duda
E-mail: hendud@wp.pl