

## Effectiveness of interactive tasks in tactical training of 11-12-year-old football players

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### Abstract

**Formulation of the problem.** The level of tactical preparation of a football player is one of the determining factors of the success of his actions during competitive activities. A significant number of foreign specialists emphasize the importance of purposeful tactical training of football players starting from a young age which confirms its effectiveness in the practical activities of the world's leading football clubs (Italy, Spain, Germany, etc.). **Approach.** In order to determine the level of psychophysiological properties and mental processes of 11-12-year-old children, a pedagogical observation was conducted of one hundred football players who play in the Youth Football Club of FC "Lviv". In order to find out the requirements for tactical training and the focus of interactive tasks on the tactical training of football players, a survey of football coaches was conducted (a total of fifty football coaches were interviewed). Also, in order to determine the effectiveness of the author's program of tactical training in comparison with the traditional one, a pedagogical experiment was conducted, in which forty 11-12-year-old football players who play in the "Rukh" Lviv Junior High School took part.. **Objective** - to substantiate scientifically the effectiveness of the tactical training program for football players aged 11-12 years using interactive tasks. **Results.** It was established that in general, the body of children aged 11-12 years demonstrates a sufficient level of indicators of psychophysiological properties (speed of simple and complex reactions) and mental processes (thinking, attention, memory, etc.) for the implementation of purposeful tactical training. The total changes in the tactical preparedness of football players of the experimental and control groups according to the indicators of offensive and defensive actions during the pedagogical experiment showed a complete advantage of the EG players over the CG players. The experimental group's offensive abilities improved by 10.3% and defensive abilities by 9.4% compared to the results demonstrated before the start of the experiment. **Conclusions.** The higher efficiency of the program of tactical training of football players aged 11-12 years, which is based on the application of various interactive tasks, compared to the traditional training program used in the practice of Ukrainian football, has been established. The higher influence of the proposed author's program on the indicators of mental processes and the level of tactical preparedness of young football players was noted.

**Keywords:** football, stage of preliminary basic training, means, methods, educational and training process.

### Introduction

One of the most popular sports in the world today is football. Given the constant growth of sports achievements in it, accordingly, an active search for new means of improvement continues. The main part is occupied by the direction related to the improvement of training of young football players (Nikolaenko at al., 2015).

Today, the active development of the practical component in football is being monitored, while the scientific and theoretical component is not fully correlated with it. This is clearly visible in the activities of private football organizations that train football players. The recruitment of children to such clubs on a systematic basis is carried out from the age of 3. At the same time, the "Football" program (2003), in accordance with which the coaches of the Junior High School work, defines the starting age of football lessons at 6 years. This confirms the data of the fundamental work on the theory of sports "System of training athletes in Olympic sports: general theory and its practical applications" (Platonov, 2015). At the same time, there is currently a trend towards early specialization in the practice of training football players in state organizations. Accordingly, there is a contradiction between the requirements for football players defined in the training theory and those that exist in practice (Nikolaenko at al., 2015).

This indicates the need to find new approaches to the construction of the educational and training process, which would: allow preparing athletes in accordance with the requirements of modern football, correlate with

their anatomical, physiological and psychological development features and exclude the phenomena of a forced training process (Dzhur et al., 2021; Plakias et al., 2023).

Therefore, there is an urgent need to conduct research related to the training of football players at the early stages of multi-year improvement in general and, in particular, within the limits of tactical training because, in addition to the above, football practice shows that today already at the early stages of training football players it is important to select means and methods which would develop in them the ability to implement various tactical tasks that arise during training and competitive activities (Dulibskiy, 2003; Wein, 2011).

It should be noted that tactical training for a long time was considered a priority direction of the later stages of multi-year sports improvement, however, modern trends in the development of football necessitate the introduction of various tactical tasks in the training of 11-12-year-old football players already at the beginning of the EPBP (Nikolaenko et al., 2003; Nikolaenko et al., 2015; Platonov, 2015).

However, the fact that the age period of 11-12 years, which corresponds to the EPBP in football (Nikolaenko et al., 2003), is optimal for the beginning of targeted work on the tactical preparation of young football players is evidenced by the physiological features of the formation of their bodies (Wilmore et al., 2004). In children of this age, the nervous system is developing at an active pace. Adequate prerequisites for the effective formation of the basic principles of tactical preparation of football players appear precisely at the age of 11-12 (Maksymenko et al., 2000; Dulibskiy, 2003). To a certain extent, this has already been substantiated in the works of specialists, however, we have not found any information regarding the focused implementation of tactical training in the training process of Ukrainian football players in the early stages of training, despite the existing practical need.

High-quality implementation of tactical training at the initial stages of multi-year improvement, in our opinion, is possible through the introduction of modern interactive tasks that would correspond to the age capabilities of young athletes and take into account modern requirements for the sport (Kostiukevych et al., 2017; Hnatchuk et al., 2018; Doroshenko et al., 2019). Actually, interactive tasks involve children's creative realization, development of their imagination and thinking. In working with young football players, the application of various individual movement tasks with and without the ball in pairs and groups is particularly relevant in tactical training; tasks that would involve the selection of possible options for solving this or that football situation, etc. (Karpa, 2013). The use of computer technologies in working with athletes is no less expedient at the current stage of sports development (Pometun, 2007). In particular, solving various tactical tasks in a virtual environment can be effective for football players from the point of view of forming the components of tactical preparedness in them (Dulibskiy et al., 2022). This will make it possible to increase the effectiveness of the tactical training process in general and, at the same time, will contribute to increasing motivation and creating interest in playing football (Popovych et al., 2023).

It is worth noting that in the modern scientific base of game sports (volleyball, handball, basketball) there are already works that describe the implementation of tactical training at various stages of multi-year improvement through the use of modern interactive tasks (Solovei et al., 2018).

Speaking about football in this context, it is worth mentioning the works of V. Suprunovych (Suprunovych, 2013), which describes the effectiveness of monitoring the level of tactical preparedness of football players at various stages of long-term training using the latest interactive tools.

Therefore, at the present time there is a contradiction between the practical needs to ensure the process of rational tactical training at the stage of preliminary basic training and the filling of the theoretical and methodological base which currently does not contain a sufficient number of modern methods and tools to ensure proper tactical training of young football players in practice (Wein, 2011; Nikolaenko et al., 2015; Kostiukevych et al., 2017). The active development of innovative technologies contributes to the accelerated physiological and intellectual development of children, so it can be assumed that by applying modern approaches using interactive tasks within the tactical training of young football players, it is possible to obtain a qualitative increase in their readiness in general (Wilmore et al., 2004; Karpa, 2013; Suprunovych).

**The goal of the work:** to substantiate scientifically the effectiveness of the tactical training program for football players aged 11-12 years using interactive tasks.

## **Material and methods**

### **Participants**

One hundred children aged 11 (n=46) and 12 (n=54) years old, who are engaged in the junior high school of FC Lviv, took part in the observation. Everyone performed the same tasks.

Fifty football specialists who have a UEFA license (48% with a C license, 30% with a B license and 22% with an A license) took part in the survey (questionnaire).

In the pedagogical experiment, forty 11-12-year-old football players were involved in the "Rukh" youth secondary school in Lviv (twenty of them in the control group and twenty in the experimental group).

The parents of the subjects gave consent for their participation in the study. The study was conducted in accordance with the Declaration of Helsinki.

The tests chosen by us to determine the level of: psychophysiological properties, mental processes and tactical preparedness of children 11-12 years old correspond to the specifics of competitive activity in football, which became a key criterion for their inclusion in the study.

The results were obtained by initially collecting during the conduct of: a survey (questionnaire), pedagogical observation and an experiment, which were further processed by the methods of mathematical statistics (described below).

#### **Procedure**

##### **Analysis and synthesis.**

Our method is used for the analysis of educational and training programs of State University of Applied Sciences and Private Organizations in game team sports. In order to identify the modern scientific opinion regarding the issues of the research, the modern data of foreign and domestic scientific literature related to the tactical training of young football players were analyzed.

##### **Pedagogical observation.**

In the study, with the help of pedagogical observation, the prerequisites for the qualitative implementation of tactical training of 11-12-year-old football players were determined (in particular, indicators of psychophysiological properties and mental processes). For five days, the level of psychophysiological properties and mental processes of children of a given age was determined (from 31.03.21 to 04.04.21 on the basis of the FC "Lviv" Youth School, Lviv).

To objectify the acquisition of operational information, the complex for psychophysiological testing "Neurosoft-psychotest" was used.

On the basis of 12 methods, an analysis of the level of psychophysiological properties and mental processes of children aged 11-12 years was carried out, studied:

1. Simple visual-motor reaction (ms) - fixing the reaction time to a signal.
2. Discrimination reaction (ms) – fixing the reaction time to signals with the condition of analyzing their colour.
3. Selection reaction (ms) – fixing the reaction time to signals with the condition of analysis and selection of their colour.
4. Assessment of attention (ms) - fixing the time of reaction to signals, similar to PMR, but the signal is sent to the monitor, not to the device.
5. Immunity to interference (ms) – fixing the reaction time to signals in conditions of interference. Similar to conducting an attention assessment, but in addition to the main signal, various interferences are applied to the monitor.
6. Reaction to a moving object (ms) - fixing the reaction time when the object moves on the monitor.
7. Critical frequency of light flickering (Hz) – fixing the frequency of merging flickering on the monitor.
8. Contact coordinometry by profile (s, number of touches) - fixing the accuracy of controlling body movements when solving motor tasks.
9. Tapping test (number of touches) - determination of strength and mobility of nervous processes.
10. Shulte-Platonov's red-black tables (p.) - determination of the volume, switching and distribution of attention.
11. Raven's tables (points) - determination of the level of logical thinking (intelligence).
12. Test "Three" (c., number of moves) - determination of the level of operational thinking (Mantrova, 2007).

##### **Survey (questionnaire).**

A survey of football coaches was conducted to find out the requirements for tactical preparedness and the focus of interactive tasks on the tactical training of football players for the EPBP (held during April-May 2021). The questionnaire included fifteen questions. The questions related to the peculiarities of the implementation of tactical training for football players aged 11-12 years, its requirements, the use of interactive tasks in the process, etc.

##### **Pedagogical experiment.**

A pedagogic experiment was conducted on the basis of the "Rukh" secondary school in Lviv (personally by the authors of the article). In our study, the pedagogical experiment was characterized by only minor changes in the process of training 11-12-year-old football players. Regarding the implementation of the process of tactical training of football players aged 11-12 years, the main changes took place due to the introduction of interactive tasks into the educational and training process:

1. Interpretation of game situations in football, in particular the choice of the most effective option during offensive and defensive actions.
2. Tasks to demonstrate tactical knowledge using demonstration tools.
3. Simulation of offensive and defensive actions by using virtual football simulators.
4. Practical movement tasks that reproduce the conditions of competitive activity in football.

All other components remained relatively constant (training tasks, conditions, duration, etc.).

For two days in the control group and ten in the experimental group, the effectiveness of the author's program compared to the traditional one was determined (based on the processing of test results before the beginning of the pedagogical experiment and after its completion in the studied groups). In the control group, classes were conducted according to the approved training program of the Rukh Academy in Lviv (Bilyai et al., 2020). In the experimental group according to the experimental program developed by the author.

Assessment of the level of tactical preparedness of football players aged 11-12 years (EG and CG) was implemented by conducting 24 tests (for each type of interaction - "1x1", "2x1", "2x2" and "3x2") for 6 control exercises:

- Line attack (in attack - you need to get the ball behind the line defended by the opponent, and in defense - intercept the ball);
- Completion of the attack on four goals (in attack, you need to score the ball into one of the four goals, and in defense, intercept the ball and score it into the goal yourself);
- Attack - Defense (in attack you need to score the ball into one of the two goals (in case of a loss, defend your own goal), and in defense - to defend your own goal (in case of an interception, score the ball into the opponent's goal).

The number of successful attempts during offensive and defensive actions was recorded.

Also, the level of development of mental processes was determined in 11-12-year-old football players, taking into account its close connection with tactical preparedness (before the beginning and at the end of the pedagogical experiment, during one day).

The pedagogical experiment in our study lasted for 6 months (from 10.01.22 to 15.07.22). EG participants trained according to the six blocks determined for them, the duration of each of which was 6 weeks.

#### **Devices**

The assessment of psychophysiological properties and mental processes of football players aged 11-12 years was carried out using the computer-hardware complex "Neurosoft-psychotest" and personally by the researcher according to selected methods (Mantrova, 2007). Also, an electronic stopwatch (Casio) was used to conduct a pedagogical experiment.

#### **Statistical analysis**

For statistical analysis, the following programs were used: Statistics Kingdom and Microsoft Excel 2010. For statistical processing of the observation data, indicators were used: arithmetic mean, standard deviation, and Student's t-test.

The methods of parametric and non-parametric statistics were also used for statistical processing of the data of the comparative pedagogical experiment. The determination of the expected difference between the two average populations was made using the Student's t-test. The application of this criterion, at the level of credibility accepted in sports pedagogy ( $p=0.05$ ), involves the volume of sample populations - at least 30, or the assumption of the normality of the distribution of the sample population. The size of the studied groups in the amount of 20 people within the scope of our study indicated the expediency of using a criterion that would allow testing the hypothesis of the normality of the data distribution. As such a criterion, we used the Shapiro-Wilk criterion. The calculation of numerical data to determine statistically significant differences in the absence of a normal distribution was carried out using: Mann-Whitney tests (to determine the intergroup discrepancy of indicators between K and EG) and Wilcoxon (to determine the intragroup difference of the results obtained at the beginning and at the end of the experiment).

#### **Results**

Taking into account the data received and the problem posed, we conducted a study (from 31.03.21 to 04.04.21 at the base of the FC "Lviv" DYUSH, Lviv), which related to the identification of prerequisites for the high-quality implementation of tactical training of 11-12-year-old football players. In particular, for this, the level of psychophysiological properties and mental processes of 11-year-old ( $n=46$ ) and 12-year-old ( $n=54$ ) children was determined.

The processing of the received actual material made it possible to reveal:

- The two studied groups have a high level of simple reaction speed;
- In both age groups of young football players, the speed of complex sensorimotor reaction is high (lability of the nervous system of most of the subjects);
- Balance of the nervous system in young football players (with a preference for excitement in 12-year-olds and inhibition in 11-year-olds);
- In both studied groups, the majority of subjects had an intermediate type of nervous system (between inert and labile);
- The subjects of both groups have a high level of interference resistance (high ability to work for a long time and concentrate attention for a long time);
- Football players 11-12 years old have average coordination of movements;
- The young football players of the two groups have a high speed of switching attention, a high level of concentration and stability of attention in the subjects (a sign of the strength and balance of the nervous system);

- Football players of both groups have an average level of intelligence and logical thinking;
- The football players of the two groups have a high level of development of operational thinking (Nakonechnyy at al., 2021).

Statistically, significant differences in indicators of psychophysiological properties and mental processes of football players of two groups of 11 and 12 years old were found only for three of the 14 selected indicators from the definition: choice reaction ( $p \leq 0.01$ ), amount of concentration and stability of the athlete's attention ( $p \leq 0.01$ ) and operative thinking ( $p \leq 0.001$ ). Therefore, there is no significant difference between the level of psychophysiological properties and mental processes of 11-12-year-old football players (Nakonechnyy at al., 2021).

According to all implemented methods, 12-year-old football players have a slight advantage compared to 11-year-old players. However, the subjects, regardless of age, demonstrated a sufficiently high level of intellectual abilities, manifestation of psychophysiological properties and mental processes (Nakonechnyy at al., 2021).

Also, the demonstrated indicators of psychophysiological properties and mental processes by football players of both groups (11 and 12 years old) are close to the results of adult athletes, and therefore the subjects demonstrate a readiness to start implementing the process of purposeful tactical training (Nakonechnyy at al., 2021).

The next step, within the framework of the development of an experimental program of tactical training for football players aged 11-12 years, was a survey of football specialists ( $n=50$ ) regarding the attitude to tactical training and preparedness of football players in the early stages of multi-year sports improvement (held during April-May 2021). In particular, it was determined that: at EPBP, the priority areas of football player training are: technical (37%), physical (24%) and tactical (17%). The majority (68%) consider the tactical training of a young football player to be one of the determining factors of the effectiveness of his competitive activity. Also, 36% of respondents believe that it is necessary to start carrying out a targeted process of tactical training with football players who have reached the age of 11-12, another 28% indicate that work in the tactical direction in football should start from the age of 6-8 (Nakonechnyy at al., 2022).

The priority direction of tactical training for the EPBP is to improve the tactical skills of young football players (86% of responses), tactical skills (74% of responses), tactical knowledge (70% of responses) and tactical thinking (68% of responses). To some extent, we do not agree with the fact that football players should already form tactical skills at a young age, since this is a priority for the later stages of multi-year sports improvement (Nakonechnyy at al., 2022).

According to the opinions of the majority of respondents (76% of responses) to the EPBP, the group form (GF) of conducting classes should be a priority during the tactical training of football players. As for training methods at this stage, experts preferred visual (86% of votes), verbal and the method of training without an opponent (82% of responses) (Nakonechnyy at al., 2022).

The majority of interviewed coaches gave priority to the means of tactical training to training (92% of answers) and competitive exercises (76% of answers). It was important for us to determine the importance of using interactive tasks in the training of young football players. It was found that among the total number of respondents, 52% of trainers use them in practice. We assume that many trainers do not have enough information about the interpretation of the concept of an interactive task, so it is obvious that we could face an incomplete understanding of the issue (Nakonechnyy at al., 2022).

Based on the materials of modern scientific literature, which concerns the tactical training of football players (Verheijen, 2014; Javier, 2015; Delgado at al., 2018), data obtained during the survey (questionnaire) of football specialists (Sokolova at al., 2021; Nakonechnyy at al., 2022) and the analysis of indicators of psychophysiological properties and mental processes of the body of children 11- 12 years (Lisenchuk at al., 2020; Nakonechnyy at al., 2021), we developed a tactical training program for football players aged 11-12 years, which we used during the implementation of the pedagogical experiment.

The author's experimental program provided for the comprehensiveness of the training of football players aged 11-12 years within the framework of the "tactical training" component with the parallel inclusion of tasks from the physical, technical, psychological and theoretical directions of player training through the use of exercises close to the conditions of competitive activity (in particular, in situations: "1x1", "2x1", "2x2" and "3x2" and educational and training games in various formats).

The program provided for the complex use of: the original computer game "Game Situations" (Nakonechnyy at al., 2022), virtual football simulators (FIFA 2022, Score! Match, etc.), tasks to demonstrate tactical knowledge by an athlete using demonstration tools (football field layouts, interactive screens and projectors), in addition to performing practical movement tasks on the football field: dribbling, feints, deceptive movements; works with Smart Ball; passing the ball in various ways; openings for the ball in various ways; practicing combinations in triples during attack and pairs in defense; performance of tactical exercises - "1x1", "2x1", "2x2", "3x2" and educational and training games.

The pedagogical experiment lasted 6 months (from 10.01.2022 to 15.07.2022). The state of war in the country (Ukraine) did not affect the conditions of conducting the pedagogical experiment (the infrastructure

remained intact), the studied contingent did not meet the conscription age (11-12 years old) and was not drafted into the army.

Primary testing of the components of tactical preparedness of 11-12-year-old football players was carried out at the beginning of the pedagogical experiment, which involved the performance of 6 control exercises: line attack (attack); attack line (defense); completion of the attack on the four gates (attack); completion of attack on four gates (defense); attack-defense (attack) and attack-defense (defense) within the framework of four tactical interactions - "1x1", "2x1", "2x2" and "3x2".

Regarding the initial level of preparedness of the research participants, it should be noted their relative homogeneity. A slight advantage was observed in favor of CG or EG participants in some test exercises, but in general, statistical processing of the data confirmed the possibility of introducing an experimental factor (tactical training programs with the use of interactive tasks) and conducting research on equal terms for the two groups.

At the first stage of the pedagogical experiment, the analysis of statistical data obtained as a result of testing the level of tactical preparedness of EG football players (block "1x1") showed that within the framework of EG according to the specified tests: the line of attack (defense), the completion of the attack on four goals (attack), completion of attack on four gates (defense), attack-defense (attack), attack-defense (defense), no statistically significant differences between the initial and final results of the block were found ( $p > 0.05$ ). However, according to the results of testing within the control exercise "line attack (attack)", after completing the first stage of the experiment, EG football players showed a better result compared to the original test, while the discrepancy had a high level of statistical significance (16.36%;  $p \leq 0.001$ ).

We did not establish a statistically significant increase in the level of tactical preparedness in the later stages of the pedagogical experiment based on the testing data in the "2x1", "2x2", "3x2" blocks, at the same time, we monitored the tendency to improve results in almost all tests that were conducted within these blocks.

Another stage of processing the data obtained during the pedagogical experiment was the identification and comparison of discrepancies between the initial and final testing of the level of tactical preparedness of football players EG and CG (obtained during the pedagogical experiment).

At the end of the pedagogical experiment, based on the results of testing the "1x1" block, in three control exercises out of six, a statistically significant difference was recorded between the results demonstrated by the EG and CG football players, in favor of the first. Thus, in the attack line (attack) exercise, the advantage of EG participants was 22.2% ( $p \leq 0.05$ ); completion of the attack on four goals (attack) - 27.1% ( $p \leq 0.05$ ); completion of the attack on four goals (defense) - 38.8% ( $p \leq 0.001$ ).

Regarding the next group of tests, namely the performance of control exercises within the "2x1" test block, here, as in the case of the previous test block ("1x1"), statistically significant differences between the CG and EG indicators at the end of the pedagogical experiment were recorded.

Thus, in this block, statistically significant differences in the results between groups were recorded in favor of EG in the following tests: line attack (attack) - by 25.7% ( $p \leq 0.05$ ) and completion of the four-gate attack (attack) - by 22.2% ( $p \leq 0.05$ ).

After the pedagogical experiment, no statistically significant intergroup differences were observed in any of the control exercises ( $p > 0.05$ ), according to the results of determining the abilities of football players to effectively solve game situations in the "2x2" and "3x2" test blocks.

In order to generalize the obtained results at the beginning and at the end of the pedagogical experiment, we determined the total changes in the tactical preparedness of the EG and CG football players as a whole according to the indicators of offensive and defensive actions (Fig. 1).

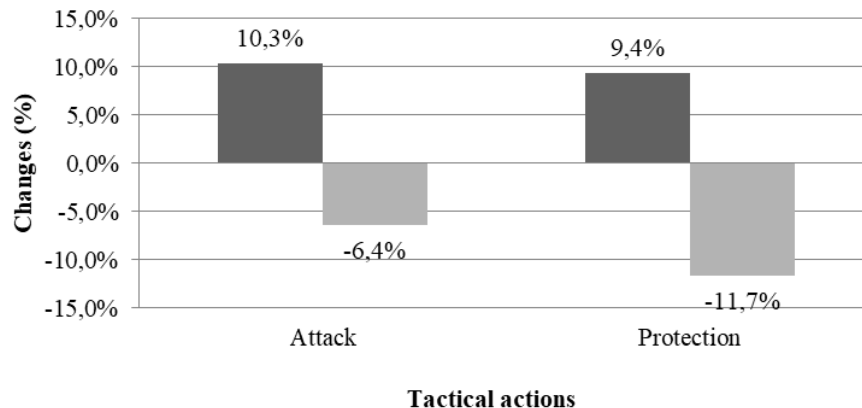


Fig. 1 Total changes in the tactical preparedness of football players EG and CG according to indicators of offensive and defensive actions during the pedagogical experiment:

■ EG, □ CG;

After the completion of the study, a significant increase in the level of offensive (by 10.3%) and defensive (by 9.4%) abilities of EG football players was recorded. Accordingly, the final indicators of the tactical preparedness of the CG players slightly decreased compared to the weekend, in particular: offensive actions - by 6.4% and defensive actions - by 11.7%. The level of tactical preparedness was tested in the form of a competition between the EG and CG players, which was victorious for the EG footballers during offensive and defensive actions.

As part of the pedagogical experiment, a separate testing block was to determine the level of mental processes of young football players aged 11-12, which are closely related to tactical preparation in sports (Tsyupak at al., 2018; Nakonechnyy at al., 2021).

Determination of the level of mental processes took place twice - at the beginning and at the end of the pedagogical experiment with EG and CG athletes.

It is worth noting that there was no significant difference between the EG and CG football players in terms of points scored during weekend testing. Only a slight fluctuation of the results in favor of one or another group was observed, but without statistical significance of differences ( $p > 0.05$ ).

The data of the final testing of indicators of mental processes of football players aged 11-12 years old, obtained after the end of the pedagogical experiment, showed that there was a statistically significant difference between the results of the CG and EG participants in the time of completing the task in working with Schulte-Platonov tables (7%,  $p \leq 0.01$  in favor of EG). Also, it should be noted that at the end of the pedagogical experiment, statistically significant changes in the results of EG athletes (from initial to final testing) were recorded for this indicator at a high level (3.9%;  $p \leq 0.001$ ).

In the middle of both groups, there were other positive changes regarding the indicators of mental processes within the selected tests. In particular, EG football players also demonstrated a statistically significant increase in results in test exercises for passing Raven's Tables (aimed at determining the level of logical thinking), EG - by 18.1% ( $p \leq 0.01$ ) and in the time of passing Game-3 (aimed at determining the level of operational thinking) - by 10.8% from the initial indicator ( $p \leq 0.01$ ). On the other hand, CG athletes, as well as EG players, recorded a significant increase in results after passing Raven's Tables (by 20%;  $p \leq 0.01$ ). The advantage of CG athletes over EG was demonstrated only by the time of completion of the Game-3 with respect to the absolute indicator by 9.1% (Fig. 2).

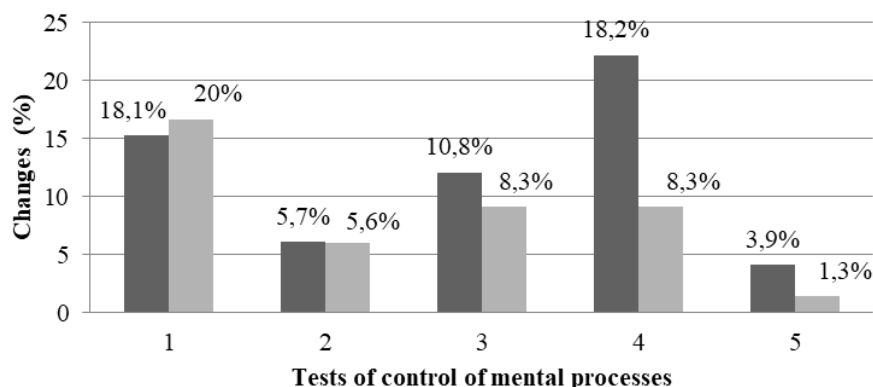


Fig. 2 Changes in indicators of mental processes of football players aged 11-12 years during the pedagogical experiment:

■ EG; □ CG;

1 – "Ravena" tables (points); 2 – Game-3 (moves); 3 – Game-3 (c); 4 – Schulte-Platonov tables (number of items); 5 – Schulte-Platonov tables (c).

Summing up, it should be stated that according to most of the investigated indicators of both tactical preparedness and mental processes, EG athletes showed a higher increase in results when training according to the author's tactical training program, which involved the use of interactive tasks in its structure.

## Discussion

We conducted a study related to the identification of prerequisites for the qualitative implementation of tactical training of football players aged 11-12 years (the level of psychophysiological properties and mental processes was determined).

The results showed that there is no significant difference between the level of psychophysiological properties and mental processes of football players aged 11-12 years.

The demonstrated indicators of psychophysiological properties and mental processes by football players of both groups (11 and 12 years old) are close to the results demonstrated by adult athletes, and therefore demonstrate readiness to start implementing a purposeful process of tactical training.

The next step was a survey of football specialists regarding the attitude to tactical training and preparedness of football players in the early stages of multi-year sports improvement. In particular, the main components of ensuring the tactical training of football players at the early stages of multi-year sports improvement were determined (Nakonechnyy at al., 2022).

On the basis of the materials of modern scientific literature related to the tactical training of football players (Wein, 2011; Javier, 2015; Delgado et al., 2018), data obtained during the survey (questionnaire) of football specialists (Nakonechnyy at al., 2022) and analysis of indicators of psychophysiological properties and mental processes of the body of children 11-12 years old (Nakonechnyy at al., 2021), we developed a program of tactical training of football players aged 11-12 years, which was used by us during the implementation of the pedagogical experiment. The program provided for the complex use of: the author's computer game "Game Situations" (Nakonechnyy at al., 2022), virtual football simulators, tasks to demonstrate tactical knowledge by the athlete using demonstration tools, in addition to the performance of practical movement tasks on the football field. The initial level of preparedness of the research participants demonstrated their relative homogeneity. Statistical processing of the data confirmed the possibility of introducing an experimental factor and conducting research on equal terms for the two groups.

The next stage of processing the data obtained during the pedagogical experiment was the identification and comparison of discrepancies between the initial and final testing of the level of tactical preparedness of football players EG and CG. At the end of the pedagogical experiment, according to the results of testing the tactical preparedness of young football players aged 11-12 (CG and EG), it was noted that in 23 final tests, EG footballers showed a greater increase in the results of tactical preparation compared to representatives of CG (also a statistically significant discrepancy between group results in favor of EG according to indicators of "1x1" and "2x1" interactions).

As part of the pedagogical experiment, a separate testing block was to determine the level of mental processes of young football players aged 11-12 Twice - at the beginning and at the end of the pedagogical experiment, the level of mental processes in EG and CG athletes was determined.

There was no significant difference between the EG and CG football players in terms of points scored during weekend testing. EG athletes demonstrated higher results in most indicators compared to CG players according to the results of repeated testing of the level of mental processes.

Summarizing the results of the research, it can be stated that our study substantiates the structure and content of the program of tactical training of football players aged 11-12 years at the EPBP using interactive tasks (interpretation of game situations in football, in particular the choice of the most effective option during offensive and defensive actions; demonstration tasks tactical knowledge with the use of demonstration tools; simulation of offensive and defensive actions with the help of virtual simulators of football games and practical movement tasks that reproduce the conditions of competitive football activity).

This program had a higher effectiveness of influence in the training process compared to the traditional training program for this age category of football players; proved the effectiveness of using an original interactive tool in the tactical training of 11-12-year-old football players - the "Game Situations" computer program, which involves the interpretation of various situations in football during attack and defense (Nakonechnyy at al., 2022).

Information is presented on the expediency of introducing purposeful tactical training into the training system of Ukrainian football players aged 11-12 years based on the application of a comprehensive approach (a combination of physical, technical, psychological, theoretical training to solve tactical tasks); the content of tactical training of 11-12-year-old football players at the EPBP has been improved (Nikolaenko et al., 2003; Nikolaenko et al., 2015; Kostyukevich et al., 2017). In particular, the necessity of using: means, methods, forms and orientation of interactive tasks during tactical training of football players aged 11-12 years was determined. It was determined that tactical training of 11-12-year-old football players in practice should occupy one of the main places in the educational and training process at the EPBP.

Also, information on the peculiarities of tactical training of athletes in team sports (Maksimenko et al., 2000; Platonov, 2015), information on modern ideas about tactical training (Dulibskyi, 2003; Karpa, 2013; Delgado et al., 2018) and requirements have been improved. for tactical training of football players aged 11-12 years (Vain, 2011; Verhein, 2014)

Future directions of research should be connected with further substantiation of the use of interactive tasks for tactical training of young football players in practice in Ukraine.

## Conclusions

It was established that a characteristic feature of the majority of the studied subjects is a labile and strong nervous system, which is important for effective football play. In general, the body of children aged 11-12 years demonstrates a sufficient level of indicators of psychophysiological properties (speed of simple and complex reactions) and mental processes (thinking, attention, memory, etc.) for the implementation of purposeful tactical training.



It was found that the optimal age for starting purposeful work on the tactical preparation of football players is 11-12 years (36% of responses). Among the key components of tactical training, which need to be prioritized at the stage of preliminary basic training, the formation of tactical skills (86% of responses), tactical knowledge (70% of responses) and tactical thinking (68% of responses). Regarding the form of tactical training classes, priority, according to the opinion of specialists, - group (76% of responses). Among the priority methods of this training area, the interviewees noted (visual (86% of responses), verbal and method of training without an opponent (82% of responses), and among the means they consider training exercises to be the most effective (92% of responses), competitive exercises (76% of responses) and interactive tasks (56% of responses).

During the experiment, statistically significant differences of intergroup results were found in favor of participants of the experimental group in the "1x1" blocks (line attack (attack) by 22.22% ( $p \leq 0.05$ ); line attack (defense) by 27.14% ( $p \leq 0.05$ ) and the completion of the attack on the four gates (defense) by 38.77% ( $p \leq 0.001$ )) in the "2x1" block: the line attack (attack) by 25.71% ( $p \leq 0.05$ ) and completion of the attack on four gates (attack) by 22.22% ( $p \leq 0.05$ ).

The football players of the experimental group demonstrated a greater increase in the results of tactical preparedness compared to the representatives of the control group in total in 23 out of 24 conducted tests.

An improvement in the indicators of the mental processes of EG athletes was recorded in the final results after the pedagogical experiment, namely: the speed of switching attention, logical thinking (intellect) and operative thinking. CG athletes, in turn, also recorded an improvement in logical and operational thinking.

Therefore, the application of a tactical training program with such meaningful content can be of great importance for the rational and qualitative improvement of the skill level of football players starting from the stage of preliminary basic training.

#### Conflicts of interest

The authors declare that there is no conflict of interest within the provided materials.

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