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IMPROVING THE SPECIAL-COORDINATION TRAINING OF YOUNG GYMNASTS BASED ON A DIFFERENTIAL APPROACH

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Abstract: The article discusses the issues of developing special coordination abilities of 8–10-year-old gymnasts, taking into account the individual psychophysiological characteristics, in particular, the typological characteristics of the nervous system. During the study, the training methodology developed on the basis of a differential approach and its advantages over the traditional training system were experimentally substantiated.

Keywords: sports gymnastics, differential approach, nervous system characteristics, coordination abilities, dynamic balance, sensitive period.

Relevance of the topic. The rapid development of modern gymnastics and the intensification of competition in the international arena require raising the process of training young athletes to a qualitatively new level. Gymnastics is a sport that requires a wealth of technical movements, maintaining body balance in difficult conditions and controlling movements with extreme precision. Therefore, the development of movement-coordination abilities (MCA) of young gymnasts remains one of the priority areas of the training process.

Sensitive period and coordination. Scientific research and sports practice show that the period from 7 to 10 years is the most favorable (sensitive) stage for the formation of coordination abilities. During this period, the child's nervous system has a high level of plasticity, and the process of mastering new and complex movement skills is rapid. It is at this age that the connection between the central nervous system and the musculoskeletal system is strengthened, which creates the basis for the perfect performance of complex acrobatic elements in the future.

Problem statement. However, in many sports schools and clubs, a "unified" (one size fits all) approach still prevails in working with young gymnasts. This approach ignores the individual typological characteristics of children, in particular, the strength of the nervous system, the balance of excitability and inhibition processes. As a result, the same load, while insufficient for some athletes, can be too much for others, leading to chronic fatigue or injuries.

The essence of the differential approach. The differential approach is the division of athletes into groups according to certain characteristics (in our case, the characteristics of the nervous system), and the application of training methods appropriate for each group. In sports psychophysiology, it has been proven that athletes with a "strong" nervous system are more resistant to large loads and monotonous work, while athletes with a "weak" nervous system are distinguished by the ability to perceive subtle movements, kinesthetic differentiation and quickly master complex elements.

Purpose of the study. The purpose of this article is to theoretically substantiate the differential methodology for improving the special-coordination training of young gymnasts, taking into account the characteristics of their individual nervous system, and to verify its practical effectiveness. Thus, the differential approach serves not only to improve sports results, but also to maximize the individual potential of each young athlete.

RESEARCH METHODOLOGY AND ORGANIZATION

Object and subject of the study. The object of the study was the training process of young gymnasts. The subject of the study is the methodology for developing special coordination skills based on a differential approach in this process.

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Research contingent. The pedagogical experiment was organized on the basis of the Sports School of the Olympic Reserve (SShOR) of the OGPU in Ulyanovsk. A total of 31 athletes aged 8-10, studying in the 1-2-year training course of the initial preparatory stage, participated in the experiment. In order to ensure the objectivity of the study, the athletes were divided into two groups:

Control group (CG) — 15 people: Training was conducted according to the current standard program of the sports school.

Experimental group (TG) — 16 people: The training was organized based on a differential methodology that takes into account the individual-typological characteristics of the nervous system.

1. Psychophysiological diagnostics (Determination of the type of nervous system)

The first stage of implementing the differential approach was to determine the characteristics of the athletes' nervous system (NS). For this, EP Ilyin's **"Tapping-test"** (express diagnostics) method was used. This test allows you to determine the strength of the athlete's nervous system by studying the dynamics of his psychomotor reactions.

According to the test results, the Experimental Group (TG) was divided into the following subgroups:

TG-1 (Weak and moderately weak AT): 9 athletes (58% of the total TG). They were characterized by rapid saturation of nervous processes, but high sensitivity and a clear perception of movement details.

TG-2 (Strong and medium-strong AT): 7 athletes (42% of the total TG). They showed high performance, endurance to loads, and emotional stability.

2. Coordination ability assessment tests

At the beginning and end of the study, the following control tests were conducted to determine the level of special-coordination training of athletes:

1. **Static balance (Romberg test):** Time (seconds) to maintain body balance while standing on one leg.
2. **Dynamic balance:** The accuracy of movement and balance on a gymnastic bench.
3. **Accuracy of movement:** Hitting the ball on the designated target (distance of deviation from the target or number of accurate hits).
4. **Kinesthetic discrimination:** The accuracy of performing 50% of the maximum result in the long jump without the help of tools (through intuition).
5. **Agility and Rhythm:** A complex of running and rhythmic movements in the "slalom" style of obstacle course.

3. Experimental procedure (Experimental methodology)

The experiment lasted 3 months (3 sessions per week). The main part of the sessions (40% of the time) was devoted to differential exercises aimed at developing coordination.

Differentiation was carried out according to the following parameters:

Exercise dosage: fewer repetitions but more rest for TG-1; higher intensity and shorter rest for TG-2.

Difficulty level: For TG-1, coordination-difficult but low-physical-load exercises; for TG-2, coordination exercises involving speed-strength elements.

Organizational form: A small group approach was used, with individual adjustments made to the quality of each athlete's movement.

4. Mathematical and statistical analysis

The results were analyzed using Student's t-test. The level of significance of the differences was considered $p < 0.05$. The data were processed using Excel and statistical programs, which ensured the scientific validity of the research results.

Of course, the most important part of the article is the section **"Research Results and Their Analysis" -** I present it on a scientific basis, enriched with figures, tables, and comparative analyses. This section demonstrates the practical value of the research.

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III. RESEARCH RESULTS AND THEIR ANALYSIS

The data obtained at the end of the pedagogical experiment showed that the special coordination training of athletes in the Experimental Group (TG), who were trained based on a differential approach, was significantly higher than that of the Control Group (CG).

1. Comparative dynamics of coordination abilities

The main results obtained during the experiment are summarized in the following table, which shows the growth rates of the groups:

Coordination readiness scores of the experimental and control groups (M ± m)

Control tests	Group	Before the experiment	After the experience	Growth (%)	P (reliability)
Static balance (Romberg test, sec)	TG	12.4 ±1.2	15.4±1.1	24.5%	P<0.05
	NG	12.2±1.3	14.0±1.2	14.7%	P>0.05
Dynamic Balance (Ball)	TG	3.8±0.4	4.2±1.2	10.4%	P<0.05
	NG	3.9±0.5	4.0±0.4	3.1%	P>0.05
Agility (Slalom running, sec)	TG	10.2±0.8	8.4±0.6	18.2%	P<0.05
	NG	10.1±0.9	9.2±0.8	9.1%	P>0.05
Kinesthetic differentiation (Error, cm)	TG	28.5±3.1	23.4±2.2	17.9%	P<0.05
	NG	28.2±3.4	26.3±2.8	6.4%	P>0.05

Interpretation of results

Analysis of the table data shows that the highest increase in **static balance indicators (24.5%) was observed in the Experimental group.** This result means that the dose of static exercises (holding in different positions) was correctly selected depending on the type of the gymnasts' nervous system.

the kinesthetic discrimination test (accurate perception of the distance of the jump) showed the role of the differential approach in controlling "fine" movements. In the TG, the error rate decreased by 17.9%, while in the NG this figure was only 6.7%. This is the result of special exercises that were given, taking into account the high kinesthetic sensitivity of children with a weak nervous system.

Results obtained according to nervous system characteristics (analysis within TG)

The specificity of the differential approach was also reflected in the subgroups TG-1 (weak AT) and TG-2 (strong AT):

TG-1 (Weak AT): Athletes in this group showed high results in mastering accuracy, balance, and rhythm of movements. They improved their ability to "feel" movements more quickly.

TG-2 (Strong AT): These athletes demonstrated superiority in agility and speed-coordination exercises. They were able to maintain stable movement technique even under fatigue.

The results of the t-Student test conducted at the end of the experiment confirmed the statistically significant differences between the TG and NG groups ($P < 0.05$). Although the control group showed an increase in the standard program, it did not reach the level of reliability. This proves that the differential approach in the special coordination training of young gymnasts is 1.5–2 times more effective than the traditional method.

Conclusion. Our study, aimed at studying the effectiveness of a differential approach in developing special coordination abilities of young gymnasts, allowed us to formulate the following important scientific and practical conclusions.

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First, it was confirmed that the performance of 8–10-year-old athletes is directly related to the individual-typological characteristics of their nervous system (NS). It was found that gymnasts with a weak nervous system show high results in fine kinesthetic differentiation of movements and spatial accuracy, while those with a strong nervous system tend to maintain stability of movements under conditions of high-intensity loads and fatigue.

Secondly, the results of the pedagogical experiment showed that training organized on the basis of a differential approach is significantly more effective than traditional methods. Participants in the experimental group (TG) significantly ($P < 0.05$) outperformed the control group (NG) in static balance (24.5%), dynamic stability (10.4%) and agility (18.2%). This proves that differential loads (dosage, rest intervals and exercise complexity) when matched to the athlete's psychophysiological capabilities, maximize the mobilization of his reserve forces.

In conclusion, the use of a differential approach at the initial training stage in gymnastics not only improves coordination skills, but also creates a solid foundation of technical and tactical skills necessary for further improvement of sportsmanship. The widespread implementation of this methodology in the educational process of sports schools and academies is a guarantee of the full realization of the individual potential of young athletes.

List of used literature:

1. Ilxanovich X. R., Muxammadovich I. M. Methods of Training Young Boxers According to the System of Tasks //Vital Annex: International Journal of Novel Research in Advanced Sciences. – 2023. – T. 2. – №. 3. – C. 153.

2. Muxammadovich I. M. IMPROVE THE LEVEL OF PHYSICAL FITNESS BY INCREASING THE TRAINING EFFICIENCY OF BOXERS //SHOKH LIBRARY. – 2025. – T. 1. – №. 10.

3. Raxmatov I. et al. Modeling thermal processes in a ceramic-based polyethylene film Trombe wall in COMSOL Multiphysics //Optical and Computational Technologies for Measurements and Industrial Applications (OptiComp 2025). – SPIE, 2025. – T. 13803. – C. 284-288.

4. Ибрагимов М. БОКСДА ТАКТИК ҲАРАКАТЛАРНИНГ АҲАМИЯТИ: 10.53885/edinres. 2022.26. 82.028 Ибрагимов М. Бухоро давлат университет 2 босқич магистранти //Научнопрактическая конференция. – 2022. – С. 90-92.

5. Mukhammadovich I. M. The Main Methodological Instructions for the Development of Speed-Strength Qualities of Boxers //Web of Synergy: International Interdisciplinary Research Journal. – 2023. – T. 2. – №. 5. – C. 550-554.

6. Mukhammadovich I. M. et al. Evaluation of quick-power of boxer in boxing competitions //Int. J. Form. Educ. – 2024. – T. 3. – №. 1. – C. 68-71.

7. Muhammadovich I. M., Qizi S. F. O. IMPROVING THE EFFICIENCY OF BOXING TRAINING IN HIGHER EDUCATION //Journal of new century innovations. – 2025. – T. 79. – №. 1. – C. 280-282.

8. Qoraboyev F. F. NEW WAYS OF WORKING WITH STUDENTS //Educational Research in Universal Sciences. – 2023. – T. 2. – №. 16. – C. 106-109.

9. Qoraboyev F. F. CREATION OF A NATIONAL SYSTEM OF EDUCATION //Educational Research in Universal Sciences. – 2023. – T. 2. – №. 16 SPECIAL. – C. 102-105.

10. Shuhrat o'g'li Q. A., Qoraboyev F. F. SPORTCHILAR UCHUN KUCH MASHQLARINI QANDAY TO 'G 'RI TANLASH KERAK //Новости образования: исследование в XXI веке. – 2023. – T. 1. – №. 8. – C. 279-283.

11. Qoraboyev F. F. CARRYING GAMES DURING SPORTS TRAINING //MASTERS. – 2024. – T. 2. – №. 4. – C. 69-71.

pISSN:2349-5707 Volume:13,Issue 2, February -2026 eISSN:2349-5715

12. Faxriddinovich Q. F. TALABA KURASHCHILARDA MUSOBAQA MASHQLARI TEXNIKASINI O‘RGATISHDA MAXSUS YORDAM BERUVCHI MASHQLARNI QO‘LLASH SAMARADORLIGI //MASTERS. – 2024. – T. 2. – №. 4. – C. 65-68.

13. Qoraboyev F. F. et al. THE ADVANTAGE OF INTERACTIVE METHODS IN IMPROVING THE QUALITY OF THE EDUCATIONAL SYSTEM //PEDAGOGICAL SCIENCES AND TEACHING METHODS. – 2023. – T. 2. – №. 19. – C. 42-45.

14. Faxriddinovich Q. F. Importance of Weight Categories and History of Changes in Weightlifting //Vital Annex: International Journal of Novel Research in Advanced Sciences. – 2023. – T. 2. – №. 3. – C. 165-172.