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PHYSICAL TRAINING OF STUDENTS SPECIALIZING IN ARTISTIC GYMNASTICS

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ABOUT ARTICLE

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Abstract: This article examines the development of special physical and technical preparedness of gymnast students during the educational and training sessions of the "Improving Sports and Pedagogical Mastery" course, in the context of the challenges in training gymnastics coach-educators.

Introduction. The professions of "physical education teacher" and "gymnastics coach-instructor" are purely pedagogical. In the process of mastering the course, students must acquire a sufficient amount of both specialized knowledge, skills, and abilities related to teaching basic and sports gymnastics, as well as general pedagogical disciplines [1,2,3,7]

According to M.L. Zhuravin [2]; V.M. Smolevsky et al. [1,4]; M.N. Umarov, A.K. Eshtaev [7], a graduate of a specialized higher education institution should be able to organize and conduct training sessions in traditional and non-traditional types of gymnastics. They should be able to teach students programmed gymnastic exercises in educational institutions, children's and youth sports schools, and organizations and institutions that provide physical education and health improvement for the population [1,3,5,6]. For the practical implementation of these skills, students are required, over the course of four years, not only to increase their level of readiness for professional and pedagogical activity based on the

development of special and subject-specific knowledge and skills in basic and apparatus gymnastics, which determine their level of training, but also to meet the requirements of the qualification program for initial grades at a high sports and technical level [1,2,6].

Purpose of the study. To improve the Special Motor Training (SMT) of gymnastics students during educational and training sessions in the "Sports and Pedagogical Improvement" (SPI) course.

Research objective. To experimentally substantiate a comprehensive training program aimed at developing physical fitness and enhancing technical preparedness of students specializing in gymnastics.

Research Organization. A control assessment of knowledge and skills revealed that the majority of first-year students admitted to the "Theory and Methodology of Gymnastics" specialization are unable to explain, demonstrate, or conduct elementary exercises from the school curriculum of basic, let alone sports gymnastics. To implement a wide range of theoretical and practical program requirements for graduates of the Uzbek State University of Physical Culture and Sports (UzSUPCS), a pedagogical experiment was organized and conducted with 38 male students specializing in sports gymnastics (from September 2019 to June 2022). Before the experiment began, the subjects were divided into two equal groups (19 people each): experimental (EG) and control (CG). Training was conducted in the form of group sessions, as they are the most rational and allow for compliance with all conditions and requirements of the pedagogical process. The structure of each academic and training session in the "Improving Sports and Pedagogical Mastery" (ISPM) course consisted of: preparatory, main, and concluding parts [1,2,3,7]

The experimental group (EG) students followed our developed comprehensive program, while adhering to the general scheme and structure of the lesson-by-lesson work program for the "Gymnastics" discipline and the PSPM course. Based on this, we identified a set of requirements determining the approximate volume of knowledge and skills that a gymnastics-specializing graduate of the Uzbek State University of Physical Culture and Sports should master. The educational process in the control group (CG) was structured in accordance with the plan and schedule of the approved work program for the courses, i.e., following the generally accepted methodology [1,2].

When developing the comprehensive program, in order to consistently improve the physical condition of EG students, special attention was given to the rational distribution of time, means, and training methods in the preparatory and concluding parts of academic and training sessions in the SPS course.

It was proposed that during academic classes, EG students learn program exercises in basic and apparatus gymnastics, while their improvement and subsequent knowledge assessment are carried out in the SPS course classes, thus closing the circle of the previously interrupted process. Additionally, to improve the level of special motor training (SMT), hours allocated for self-study were utilized. Furthermore, at the beginning of each semester, students were provided with a list of questions from the "Fundamentals of Sports Training" section. The level of knowledge was determined by the student's ability to competently present the prepared material in seminars and practical classes. For EG students, it was proposed to conduct educational practice on apparatus gymnastics sections during classes in the SPS course divisions:

- preparatory part (organization and conduct of drill and general developmental exercises (GDE), active games, applied gymnastics - AG);

- main part (learning and improving elements, combinations, and connections on apparatus, selective physical training (PT) approach-developmental complexes, and technical training (TT) preparatory exercises in multi-event gymnastics);

- concluding part (organization and conduct of specialized active games for coordination and joint mobility, athletic gymnastics - AG, exercise complexes for restoring body functions).

The level of mastery of program sections by course students was assessed at the end of each semester by an expert commission composed of leading department instructors. The indicator of student preparedness in the control group (CG) was the current and final rating converted to points, while in the experimental group (EG) it was the results (assessment) of the educational practice.

Comparative analysis of preliminary research data and special literature materials (1,2,6,7) showed that the provision of the gymnast's sports and technical preparedness (STP) when performing exercises on apparatus is largely determined by the balanced interaction of physical preparedness (PP) components, primarily joint mobility, the manifestation of speed-strength capabilities and coordination abilities, etc.

At the same time, exercises on each apparatus require a specific structure of abilities:

- to successfully master the exercises on the horizontal bar, good mobility in the shoulder joints, strength of the arm muscles, abdominal muscles, and back muscles are needed;

- on the parallel bars, mobility in the shoulder and hip joints, dynamic and static strength of the arm and upper shoulder girdle muscles, and strength endurance are necessary;

- mastering vault jumps requires good jumping ability, coordination of movements, spatial orientation, decisiveness, and courage;

- in floor exercises, success depends on the mobility of all body parts, coordination of movements, and jumping ability;

- on rings, success depends on the manifestation of strength abilities in dynamic and static modes, and mobility in the shoulder and hip joints;

- on the pommel horse, the gymnast must possess a high level of movement coordination, mobility in the hip joint, dynamic strength, as well as strength and coordination endurance.

Research results. Over the course of three semesters (1st and 2nd year), exercises and complexes of special physical training (SPT) were performed, based on these exercises and taking into account the biomechanical structure of movements. Additionally, a combined group of applied and athletic gymnastics exercises was implemented. In subsequent semesters, all work on the development of special motor skills was already structured based on the recommendations and regulatory requirements of the qualification program (3).

According to the control test data, the level of SPT and technical preparation (TP) at the beginning of the experiment among students in the studied groups did not have significant differences. The average score for types of training is below the requirements of the qualification program and ranges from 5.70±0.66 to 5.58±0.74 for SPT, and 6.32±0.47 to 5.40±0.50 points for TP, respectively (evaluated on a 10-point scale adopted in gymnastic sports).

The results of the conducted research on the FP level showed that by the final semester, the performance of all students participating in the experiment increased, albeit not uniformly. However, the increase in FP indicators among CG students did not significantly ($P \geq 0.05$) exceed the data we recorded in the previous year (7.6±1.43 and 7.11±1.11, respectively) (Table 1, Figure 1). Meanwhile, EG results improved more substantially (at $P<0.01$), with the most significant improvements observed in joint mobility (12.7%), choreographic preparedness (16.5%), and coordination abilities (28.1%).

The effectiveness of our proposed program for developing motor qualities is confirmed by the progressive growth dynamics of the "school" of movements (choreographic training) and physical qualities indicators, as well as the coefficient of variation (V%).

Table 1.

Results of control tests on the physical fitness of students in the studied groups at the end of the experiment (points) (May 2022, 8th semester)

Physical fitness indicators	At the end of the experiment				t	P
	EG ()	V%	CG ()	V%		
1. Coordination abilities (coord. ab.)	8.57±0.56	6.5	6.17±0.95	15.4	3.3	0.01

2. Choreographic training (choreog. t.)	8.47±0.47	5.5	7.07±0.97	13.7	3.1	0.01
3. Speed-strength training (SST)	8.09±0.36	4.4	7.03±1.14	16.2	2.0	0.05
4. Joint mobility (flexibility)	9.13±0.24	2.6	8.07±1.65	20.4	2.0	0.05
5. Special endurance (spec. end.)	8.29±0.51	6.5	7.20±0.84	11.7	2.3	0.05
6. Average score for SFP	8.51±0.43	5.05	7.11±1.11	15.6	2.4	0.05

As shown in Table 1, the variation in V% values among EG students is more homogeneous compared to the variation data of CG characteristics (5.05 and 16.5%, respectively). This indicates that the training methods used and the stage-by-stage monitoring of the "utilization" process of FP and PG exercises for the studied qualities are effective and can be recommended for inclusion in the work program of the specialization course and PSPM.

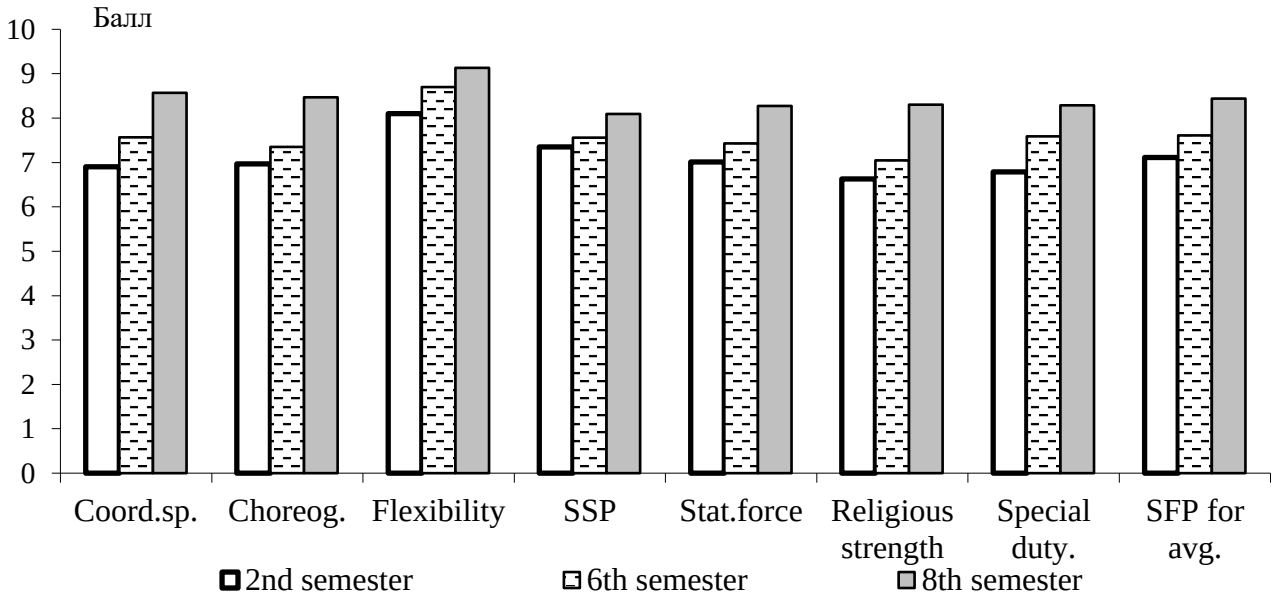


Fig.1. Results of expert assessment of control tests according to physical fitness of students in the experimental group

According to several sports gymnastics theorists (3,6,7,9), motor skill in gymnastics is a perfect, rational way of controlling movements in a holistic gymnastic exercise, from the perspective of the technique of the studied exercise and gymnastic style. The authors correctly

note that motor skills in gymnastics are a subjective factor in a gymnast's performance: the better they are developed, the higher the athletic mastery.

The objective factor is the conditions under which the training process takes place.

The motor skill in EG students was developed through multiple stereotypical repetitions of movements or the studied exercise as a whole during academic classes and PSPM courses. No significant changes were made to the structure of the exercise, and it was typically performed under the same conditions. The execution technique gradually approached the planned model from semester to semester, specifically meeting the requirements of the qualification program (5,7).

The SDP and TP of the EG students were determined by their ability to gradually master and improve basic and sports gymnastics exercises:

- in the first stage (1st semester) - general developmental exercises, drill and applied exercises, basic hangs and supports, swinging in them, handstands on the floor and on stands, splits, forward and cartwheel somersaults, slow somersaults. Work on developing physical fitness, elementary trampoline jumps, and choreographic training.

- in the second stage (2nd-3rd semesters): - general developmental exercises, postural gymnastics, round-off, back handspring, forward and backward somersaults with longe and into foam pit, circles on pommel horse with both legs and with one leg, kip-ups and double leg circles, depth jumps with soft landing, vaulting with straddled and tucked legs over the horse width-wise and length-wise, trampoline jumps, choreographic training. Work on developing physical fitness.

- in the third stage (4th-8th semesters) - elements, connections, combinations, and routines of the 2nd qualification program and, when possible, for 1st category students. Work on developing physical fitness, trampoline jumping, and choreographic training. During this period, gymnastic style was formed, and training focused on the technique of performing apparatus exercises and their improvement.

During the research, it was observed that most of the elements of combinations, especially those of the second category, were completely unfamiliar and new to first-year students in comparison with their previous motor experience. Even such exercises as forward and backward rolls, handstands, and others involving unusual body positions in space presented great difficulty for them. In challenging situations, the trainer-instructor was recommended to assist the student by applying the following methodological techniques:

a) create a clearer representation of the exercise and the structure of movements (demonstration method);

b) apply the lead-up, developmental, and preparatory exercises we have proposed;

c) provide physical assistance and ensure reliable spotting;

d) fix individual positions and "guide" the gymnast through separate phases of the complex coordination exercise;

e) use special auxiliary equipment (safety belts, harnesses, foam rollers, pads, foam pits, etc.) and training devices;

f) find analogies for the exercises being studied or individual movements from the student's previous experience;

g) employ an individualized and personalized approach in the process of teaching and improving program exercises.

Pedagogical observations have shown that the same gymnastic exercises present varying degrees of difficulty for different students. Those with better motor skills and physical fitness mastered strength and flexibility exercises significantly more easily than beginners, and were more decisive and courageous. At the same time, exercises requiring complex movement coordination, intense muscle exertion, and strength endurance were considerably more challenging for all students without exception and necessitated a longer learning and improvement process.

Based on the above, we can conclude that successful training in gymnastic exercises is possible if the trainer-teacher:

- is well aware of the requirements that artistic gymnastics places on participants, and consequently, understands the structure of abilities necessary for successfully mastering the elements of the all-around program;

- understands the dynamics of this structure at various stages of athletic mastery development;

- knows the peculiarities of the relationship between individual abilities and the psychophysiological mechanisms that determine this relationship;

- possesses the ability to evaluate and develop abilities. Additionally, much depends on the teacher's methodological skill and the quality of instruction and training.

Table 2

Results of qualifying competitions for students in the experimental and control groups during the 2nd and 6th semesters (X ± δ, points)

No.	All-around events	EG		CG	
		Course Qualification Requirements		Qualification course requirements	
		2nd semester	6th semester	2nd semester	6th semester
		3rd grade	2nd grade	3rd grade	2nd grade

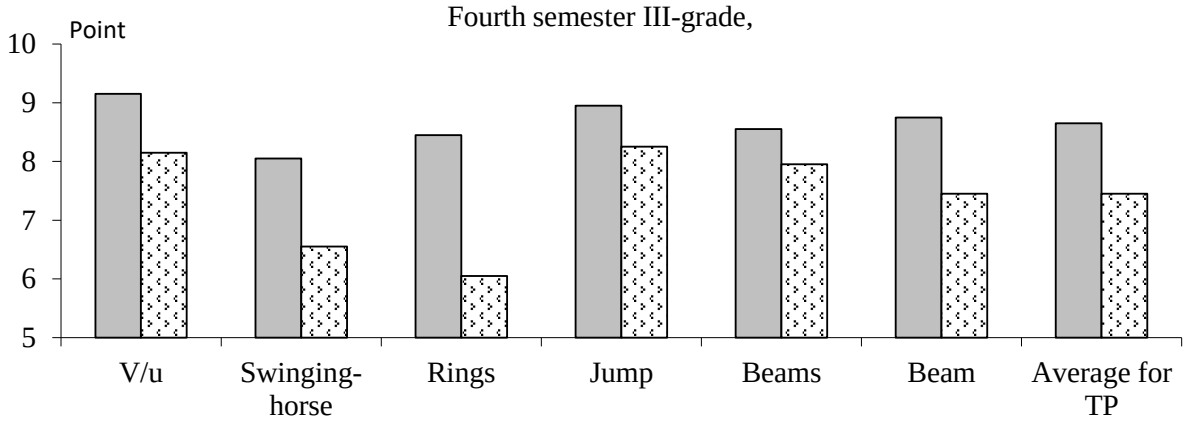
1	Floor exercise	9.15±0.19	8.77±0.37	8.15±0.57	8.35±1.44
	Pommel horse	8.05±1.12	8.05±0.75	6.55±1.06	7.45±0.43
	Vault	8.95±0.43	9.15±0.32	8.25±1.12	8.80±0.36
	Rings	8.45±0.46	8.25±0.42	6.05±0.87	7.75±0.77
	Parallel bars	8.75±0.43	8.35±0.56	7.95±1.03	7.75±0.60
	Horizontal bar	8.75±0.39	8.55±0.42	7.45±1.21	8.25±1.07
2	Total points for all-around	51.9±3.02	51.2±2.84	44.7±5.86	48.36±4.67
3	Average score for all-around	8.65±0.50	8.53±0.47	7.45±0.98	8.06±0.78

The analysis of the results from control and official competitions allowed for an objective assessment of the effectiveness of the developed training program and substantiated its practical significance:

- there was an increase in motor skills (choreographic by 46.6% and coordination by 44.4%) and physical fitness by 34.4% (Table 2 and Fig. 2), which allowed the experimental group students to master a more complex program (2nd-6th semesters, course qualification requirements);

- they were able to begin studying elements of the next grade in a timely manner and, starting from the fifth semester (8.17±0.24 points), demonstrate a consistently improving result;

- they reliably exceeded the qualification threshold (8.0 points) on all apparatus and in the average all-around score compared to the control group (Table 2 and Fig. 2).



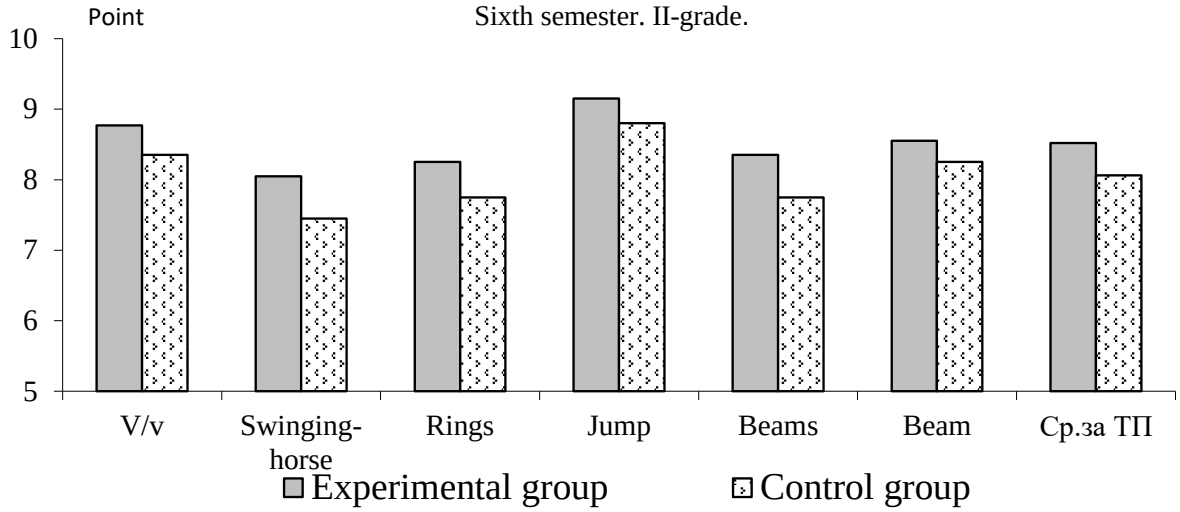


Fig. 2 Results of graded (2nd year, fourth semester) and official (3rd year, sixth semester) competitions in gymnastics all-around for students in the experimental and control groups

The results of the correlation analysis confirm a sufficiently high degree of interrelationship and mutual influence among most of the components considered, which contribute to a significant increase in students' SDP through the rational use of effective means and methods of preparation during academic classes and the SPS course. Thus, improved coordination abilities directly influenced the process of motor skill formation (r= 0.66 - 0.94), the success of mastering exercises in the qualification program (r=0.82), and the progressive development of basic physical qualities (r=0.95).

The correlational relationship between program exercises may be of particular interest to the coach-instructor of the SPS course. While drill exercises do not show a high correlation, they do impact the improvement of indicators for individual elements of basic gymnastics [GDE (r=0.41), AG (r=0.51), and PP (r=0.49)] and artistic gymnastics [floor exercises (r=0.47) and vaulting (r=0.52)].

It is noteworthy that most students in the control group (CG) failed to fully master the programmed exercises on pommel horse, rings, and parallel bars, which we recorded during the preliminary research stage. The average score on these apparatus ranges from 7.65±0.60 points. However, according to qualification requirements, this indicator should not be lower than 8.0 points (Table 2, Fig. 2). This is primarily due to insufficient physical fitness, as noted above, specifically in terms of strength capabilities and coordination abilities (Table 1, Fig. 1).

Summarizing the above, we can conclude that our proposed variant of rational distribution of functions between educational and training (SPS course) classes proved to be the most productive in teaching and improving exercises across gymnastic all-around events.

This indicates the effectiveness of the developed and experimentally substantiated program for the training of students in the experimental group (EG). The proposed approach to improving the educational process and increasing the sports and technical preparedness (STP) of student-gymnasts allows for the effective formation of professional knowledge and skills, and can be recommended for inclusion in the gymnastics curriculum.

Experimental research has established that in the process of mastering gymnastic exercises, the gymnast's spatial-dynamic perception, physical preparedness, and technical preparedness manifest themselves in unity and interconnection. It has been mathematically substantiated that there is a close relationship (r=0.901) between the magnitude of the integral indicator of the above-mentioned abilities and the success of mastering the sports category program. This conclusion fully corresponds to the data of the correlation analysis considered above.

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