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SYSTEM APPROACH TO THE REALIZATION OF MODELING AS A FEATURE OF MANAGING FUNCTIONAL CAPABILITIES AMONG QUALIFIED ATHLETES-DANCERS

Soronovych Ihor^(ABCDE), Chenguang Mu^(BCD),
Di Huang^(BCD), Diachenko Andrii^(EF)

*National University of Ukraine on Physical Education and Sport,
Kyiv, Ukraine*

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A – study concept and design; B – data collection; C – data analysis and interpretation; D – paper writing; E – paper editing; F – paper final adoption

Abstract

Relevance. Today's tendencies of sports dance development are declarative of the impact of modern knowledge in sports science on the system of improving functional support for special physical fitness among athletes-dancers. The absence of system approach regarding management of training loads has a considerable impact on forming specific methodological approaches to improving special physical fitness among dancers taking into account specific fitness level characteristics inherent for the sports combining sport and arts.

The *aim of the research* consists in developing a system approach aimed at formation of modeling special functional training among athletes-dancers taking into account specific fitness level requirements in sports dances.

Material and methods: analysis of special research and methodological literature. Theoretical methods of the research: analysis, synthesis, comparison, generalization, specification, systematization.

Results. The structure and algorithm of the realization of modeling special functional training in sports dance were developed: 1) Structural organization of the analysis aimed at forming a system approach¹⁴¹ to modeling sports training. 2) Specific principles of forming a system approach to modeling fitness level among athletes-dancers. 3) Structural and logical scheme of modeling functional fitness level among athletes-dancers. 4) Characteristics of fitness level models among athletes-dancers. 5) Supporting aids for modeling the athletes' fitness level in sports dances.

Conclusions. The system approach developed based on model-target approach of the realization of modeling as a function of managing special functional training among athletes-dancers. Forming structural components of model-target approach requires taking into account the specific components of training and fitness level inherent for the sports combining sport and arts. Structural and logical scheme of the realization of model-target approach includes the algorithm the aim of which consists in forming program support for special functional training in sports dance.



Key words: sports dances, modeling, functional training, morphofunctional models.

Introduction. In today's sports science modeling is reported on as a system component of managing training process [5].

In the research analysis, modeling is interpreted as an independent system where quality changes of each component have impact on the system in general [7]. This creates particular requirements to forming modeling based on using the principles of systemic organization of research analysis and implementation of its results into practical aspects of training athletes [16, 24].

The principles of forming a system approach to building the structure of analysis and filling it with specific content can serve as such methodological basis of modeling.

The model-target approach where the conditions of its practical realization under specific sports training conditions were formulated can serve as the mechanism of realizing system approach [2].

As to L. Matvieiev's opinion (2000), «...model-target approach constitute an operation of theoretical (logical and concept), project (calculation and constructive), and practical (practical and technological) modeling of processes connected with a single aim» [4], p. 28.

According to the authors' opinion [2, 4], model-target approach actually differs with the fact that it constitutes modeling the process of phenomenon under conditions of obvious lack of quantitative and qualitative characteristics of training and fitness level among athletes determining the

distinct peculiarities and structure of the model.

These problems become vividly apparent at the initial modeling stages already, when conducting a system analysis requires using special knowledge of the object of modeling and specification of introductory data in the course of modeling and analysis of actually the results of modeling itself. This is just what the choice of model-target approach for forming modeling in sports dances is related to.

It is known that the realization of model-target approach is based on using the methods of extrapolation and regular practical identification based on empirical ideas as well as on the formed hypothesis proved by the results of their own researches.

The set of scientific and empirical factors of forming model-target approach towards the realization of modeling in the system of training athletes-dancers personifies multi-factor logical model based on the single target instruction, substantiation and development of the model components and functions of its realization as a system component of managing the athletes' training process.

In the given case, the point is the varieties of morphofunctional models, namely the models of functional support for special physical fitness. The results of the research given below are devoted exactly to forming of such model.

The work is completed in accordance with the topic of the Plan of scientific and research work of NUUPES for the years 2021-2025 «Managing



training and competitive loads for qualified athletes in sports dances» (state registration number: 2.11 № 0121U108969).

Thus, the **aim** of the given stage consists in developing a system approach aimed at forming the modeling of special functional training of athletes-dancers in accordance with specific requirements of fitness level in sports dances.

Material and methods of the research.

Contingent of the research: the realization of general models was accomplished on the contingent of young athletes-dancers aged 16-17, the total quantity – 36 athletes (18 couples).

The realization of group and individual models was accomplished on the contingent of qualified and highly qualified athletes-dancers aged 18-30, respectively, the total quantity 40 athletes (20 couples).

Methods of the research: analysis of special research and methodological literature. Theoretical methods of the research: analysis, synthesis, comparison, generalization,

specification, systematization.

Organization of the research: The researches were conducted during two two-cycle yearly training cycles (four macrocycles) at the stage of direct training for the main competition.

The prominent athletes-dancers of Kyiv city took part in the research, notably the members of the NUUPES sports dance club «Supadance», the winners and prize takers of the world and European championships, notably of the open championships of Great Britain, Germany, Italy, and Poland as well as the traditional international open championships of London, Minsk, Kyiv, etc.

Results of the research and discussion. The methodological principles of modeling the training process were systematized and reported on in table 1 [5, 7]. It is noteworthy that the realization of the system approach is based on using the model-target approach for specifying the structure of analysis and selection of the means and methods of modeling [2, 4].

Table 1

Structural organization of the analysis aimed at forming the system approach to modeling sports training

Methodological base	Realization principles
System approach principles	<ul style="list-style-type: none"> • integrity • hierarchical nature • structuration • multiplicity • system
Model-target approach	<ul style="list-style-type: none"> • theoretical substantiation of modeling a specific object • specific designing of the object of modeling • practical aspects of the realization of modeling as a function of managing training process



The specific filling of the structure of analysis in accordance with the objectives of modeling

training and fitness level in sports dances is given in table 2.

Table 2

Specific principles of forming the system approach to modeling fitness level among athletes-dancers

Principles	Specific peculiarities of the principle's realization
Integrity	The model of the fitness level of athletes-dancers is an integral multi-component structure identifying the couple of qualified dancers.
Hierarchical nature	Modeling is based on hierarchical subordination of the types of training young qualified dancers (generalized models), qualified dancers (group models), and high-class dancers (individual models).
Structuration	The model of the athletes-dancers' fitness level constitutes the structure. Each component of the structure solves the defined functional tasks.
Multiplicity	The existence of various types of training and fitness level of the athletes, they are: a special dancing fitness level, technical, physical (functional), and choreographic one.
System	Modeling constitutes the system of interrelated components. Measuring the quality of the system component and its quantitative and qualitative characteristics has an impact on the modeling result – the model of the couple's fitness level.

In table 2, the system principles of modeling in sports dances are systemized and reported on. The specific peculiarities of realizing the system modeling principles among dancers are pointed out having impact on forming the structure of the analysis itself.

This mostly refers to considering the hierarchical subordination of the generalized, group, and individual models. According to the ascertained ideas, it complies with the quantitative and qualitative characteristics in

response to the models of young qualified athletes, qualified athletes, and high-class athletes [17, 18]. It is specific for many kinds of sport, notably those combining sport and arts [20, 21].

The complexity and specificity of modeling in sports dances are related not only to the existence of the hierarchy mentioned above, they are caused by the existence of various factors of fitness levels in the dancing couple, gender differences, discrepancies in the levels of physical and functional fitness levels, mental



and other differences between male and female partners; as well as the differences between the types of training and fitness levels, notably choreographic and integral one [6, 9, 15, 22].

The modeling of the latter type of training bases itself on the components inherent only for athletes-dancers when high level of functional readiness and physical fitness level does not contradict with demonstration of skills and specific aesthetic perception of dancing able to influence on the judges' marks [13]. For example, in

this case it often refers to regulation of more frequent breathing [23].

In table 3, the structure of model-target approach towards informing modeling in the system of training athletes is reported on. The structure is based on the unity of three components of the single process of realization of the model-target approach used in the case of distinctive insufficiency of theoretical bases for modeling in the form of sport and the respective knowledge and information background on the object and subject of modeling.

Table 3

Specific principles of forming model-target approach to modeling the athletes' fitness level

Principles of model-target approach	Result of model-target approach's effect
Theoretical substantiation of modeling a specific object	Complex modeling based on the synthesis of the competitive activity model's components, the skill model, and the morphofunctional model
Specific designing of the object of modeling	Substantiation of the form and content of the fitness level model – descriptive, graphic, and logical
Practical aspects of modeling realization as a function of managing training process	Selection of actions in the respective segment of management in accordance with the modeling result

In tables 4 and 5, the functional peculiarities of modeling the athletes' fitness level in sports dances are reported on.

The modeling functions and the result of the actions of the given function are reported on in specific sequence.



Table 4

Structural and logical scheme of modeling functional fitness level among athletes-dancers

Modeling functions	Modeling result
<p>Theoretical component of modeling The model of competitive activity is the condition for structural organization of the model of functional fitness level.</p>	<p>The structure as well as quantitative and qualitative characteristics of the model of functional fitness level is formed in accordance with continuity, intensity, and tempo-rhythmical structure of the competition program.</p>
<p>The skill model is interpreted as one of the criteria of the efficiency of realizing the model of functional fitness level.</p>	<p>The realization of the model of functional fitness level is related to increasing model characteristics of skill.</p>
<p>Practical identification of modeling The selection of structural organization of modeling based on hierarchical subordination of the generalized, group, and individual models</p>	<p>The generalized models among boys and girls aged 16-17. The model of functional potential is formed in respect with the structure of the cardiorespiratory system's response and energy supply of the male and female partners' work.</p> <p>Group models. The model of functional support for special physical fitness among dancers of standard and Latin American programs is formed based on the characteristics of practicing, steady state, and male and female partners' fatigue compensation.</p> <p>Individual models. Unique characteristics of fitness level in the couple, a male and a female partner, notably.</p>
<p>Development of the system of control, assessment, and interpretation of indicators according to the resolved standards of high, medium, and reduced fitness level</p>	<ul style="list-style-type: none"> • testing content • forming model ranges • formalized assessment of modeling indicators
<ul style="list-style-type: none"> • extrapolation of modeling into the system of managing the training process • selection of actions based on the given fitness level models 	<ul style="list-style-type: none"> • boosting the efficiency of the training means and their periodization in the system of sports training • correction of the male and female partners' training

The key aspects of the model-target approach are selection of the type of the model, substantiation of interrelations between the modeling

types as well as relationship of the developed model to the functions of managing the training process among athletes-dancers.



Table 5

Characteristics of fitness level models among athletes-dancers

Modeling functions	Modeling introductory data
Competitive activity model	Latin American and standard (European) program of competitions. General characteristics: <i>duration of each of the five dances of the program is 1.5 min., brake between dances 30 s, between rounds (semi-final – final) 20 min.</i> Tempo-rhythmical structure of dancing: Latin American program: <i>cha-cha-cha (C) 30-32 beat·min.⁻¹; samba (S) 50-52 beat·min.⁻¹, rumba (R) 25-27 beat·min.⁻¹, paso doble (P) 60-62 beat·min.⁻¹, jive (J) 42-44 beat·min.⁻¹.</i> Standard program: <i>slow waltz (W) 28-30 beat·min.⁻¹, tango (T) 32-34 beat·min.⁻¹, Vienna waltz (V) 58-60 beat·min.⁻¹, foxtrot (F) 28-30 beat·min.⁻¹, quickstep (Q) 50-52 beat·min.⁻¹.</i>
Skill model	Integral mark of 10 points for each dance, average mark of the program of five dances
Generalized models of functional fitness level	Energy supply intensity is aerobic ($VO_2 \text{ max/kg}$), anaerobic capacity (La), the CRS and aerobic energy supply speed of development and stability ($T_{50} VO_2$, V_E , VCO_2 and the CRS stability coefficient), mobility under conditions of fatigue development ($\% \text{ excess } V_E$).
Group models of functional fitness level in Latin American and standard (European) programs	Characteristics of practicing the functions ($EqPaCO_2$, $EqCO_2$, EqO_2 – the first dance), stable state ($EqCO_2$, EqO_2 , VO_2/kg – «plateau» of indicators in the semi-final), fatigue compensation ($EqVCO_2$ of the stable state / VCO_2 of fatigue compensation, $EqVO_2$ of the stable state / VO_2 of fatigue compensation, VO_2 of the stable state / VO_2 of fatigue compensation – «plateau» of indicators in the final).
Individual models of functional fitness level	Unique quantitative characteristics of generalized and group models

In table 4, there are the modeling components systematized and given in the form of an algorithm – realization of multi-component logical model including substantiation, forming, and practical realizations of the process of modeling the dancers' functional fitness level considered.

The characteristics of competitive activity and dancers' skills are provided for as a system-forming and

evaluation factors of the efficiency of the functional fitness level in sports dances.

The model of competitive activity is strictly related to a competitive process. Its components are related to tempo-rhythmical structure of Latin American and standard program dances, duration of dancing a competitive round, duration of the tournament's final part (semi-final and



final, brakes between the rounds), repeatable and changeable manner of work.

The model of skill possible to be considered as a system component of modeling training and fitness level among dancers requires specification and formalized assessment. It is not only considering the fact that dancers' skill constitutes an integral term represented in natural, dynamic and merged move of a dancing couple successively completing the figures of competitive dance composition (of various structure: slow, quick, and very quick; with rotation right or left and with no rotation; static positions) to firmly expressed (but always the same tempo-rhythmic structure) melody for dance with the manner of its performance.

All types of models require specification and forming the parameters and criteria taking part in general logistics of modeling the dancers' fitness level.

It can be firmly seen in the logical interrelation between characteristics of competitive activity, skill, and functional fitness level where the duration of competitive activity and the specific peculiarities of skill require the specific functional support [11].

On the one hand, there is enough information on the significance of a number of functional features of the system of functional support for the athletes-dancers' physical fitness – the energy supply system intensity and capacity, mobility, stability, and efficiency of functions [3, 14, 19].

On the other hand, the distinct ideas on the fact that demonstration of the dancers' skill is related to the specific manifestations of functional

support for special physical fitness manifesting in the course of competitive activity exactly in high speed of practice, duration of stable state, and fatigue compensation were formed [10, 12].

It requires pointing out special criteria of functional capabilities and their formalized assessment in accordance with their impact on the components of competitive activity and skill.

It is possible to be done the most firmly and functionally exactly based on forming integral logical structure – a multi-component model including substructures having the model's functions and features, notably the functional interrelations with other components and managing functions.

In table 6, the instruments of the model's realization having impact on the modeling efficiency are reported on.

Their realization is related to the structure of the model and requires using adequate forms of control, statistical processing of information, assessment and ways of practical realization of the modeling results.

A specific role in the modeling process belongs to statistical processing of data based on which the groups of informative indicators can be selected and be used as quantitative and qualitative characteristics of fitness level model.

The need in using the statistical analysis is related to the fact that scientific and empirical knowledge on functional fitness level among athletes-dancers include a wide spectrum of indicators characterizing various sides of functional capabilities [1, 26].



Table 6

Supporting means for modeling fitness level

<ul style="list-style-type: none"> • Control aimed at forming generalized models. • Control aimed at forming group models. 	<ul style="list-style-type: none"> • Testing in accordance with the protocol of registering VO₂ max • Modeling semi-final and final of the program of competitions
Forming the complex of informative quality model characteristics	<ul style="list-style-type: none"> • The methods of mathematical statistics indicating the informative characteristics of the model • The empirical methods of assessment proving the informative characteristics of the model
Forming the complex of informative qualitative model characteristics	<ul style="list-style-type: none"> • The methods of mathematical statistics forming model ranges – high, medium, low indicator limits • The empirical methods of assessment proving the statistical model ranges • Formalized assessment of modeling indicators
Selection the actions based on the fitness level model	<ul style="list-style-type: none"> • Improvement of the efficiency of training means and their periodization in the system of sports training • Correction of training male and female partners

The problem also consists in selecting the complex of the most informative quantitative and qualitative characteristics reflecting the analyzed process or phenomenon as a set. It requires conducting a special statistical analysis.

A successful experience of such work was presented by I. Soronovych (2013) when based on factor analysis the prominent components of functional fitness level among athletes-dancers were pointed out.

The specific capabilities of using statistical and empirical modeling methods were also reported on in the course of substantiation of the

indicators' model levels.

Among the works related to control and modeling of functional fitness level among athletes the capabilities of formalized assessment were demonstrated based on using the statistical rules of 3 sigmas. It made it possible to distinguish high, medium, low, and unique ranges of indicators of an object or phenomenon being studied [6].

For their part, the developed complexes of indicators form special requirements to the system of control. The selection of tests where the load complies with realization of the organism's function analyzed as well



as the ways of registration, assessment, and interpretation of indicators are related to it.

The realization of control and modeling functional support for special physical fitness among athletes-dancers currently constitutes some difficulties, as there is lack of information on specific manifestations of their functional fitness level in the course of completing the program of competitions.

The data on VO_2 max, La, V_E as model characteristics of functional support for special physical fitness is obviously insufficient. These characteristics of the reaction reflect functional potential of an athlete and, at the same time, provides little information on the process of functional support in the course of the whole dancing period.

It is particularly manifested in the course of evaluating the function practice, their stable state, and fatigue compensation.

The selection of actions based on the data of the fitness level model plays the role not of less importance. Forming targeted focus of modeling and using the data of generalized, group, and individual models is related to it.

Except traditional comparison of model and control indicators and training process correction, the modeling results solve important strategic tasks related to selection and sports focus among young qualified dancers, selection of specialty, searching for the most gifted athletes, and creating specific conditions for their training.

Under conditions of existence of specific scientific and empirical

experience in realization of the aspects of practical usage of modeling in sports dances, the optimization of this process, making it fit the demands and the specificity of a sport requires systematization of special data, their reinterpretation and using at the new system level.

Directing scientific searching to improve informational content and efficiency of modeling as a system component of managing the training process among athletes-dancers is related to it.

Forming a system approach and ways of its implementation into the structure of managing the training process among athletes in sports dances constitutes the most rational way of solving the problem. It mostly refers to the events, phenomena, as well as forms of organization and management of the specific sport or the key aspects of its management.

The decisive mechanism of realization of the system approach is modeling – the process making it possible to distinguish the main components of the analysis, substantiate their content, form the structure and develop the algorithm that is a specific succession of acts towards realization of integral or partial training of athletes.

The methodological base of modeling and its implementation in the form of system approach constitutes a system of interrelated components where increasing or reducing the efficiency of each element has impact on the efficiency of organization and functioning of the whole system.

At the current stage, the most rational form of realization of system approach is using a model-target



approach that will make it possible to reinterpret the existing experience and form the system of knowledge that will make it possible to improve modeling and use it in the structures of sports training among athletes-dancers.

The realization of this approach has high relevance in sports dances. In this sport, there is a visible deficiency of special awareness in the field of theory and methodology of sports training.

The transition of forms, means, and methods of sports training from other sports, notably the ones synthesizing sport and arts, is quite limited considering the uniqueness of the structure of special training and fitness level among athletes-dancers [25, 27]. It is specifically manifested in the course of organization of special physical training, notably its key components in the process of development and improvement of functional support for special physical fitness [8, 9].

The relevance of solving this problem does not provoke any doubt. The target sets of functional support for special physical fitness having targeted focus undoubtedly differ from the existing preconditions in these or those sports.

The main difference consists in the fact that high level of functional readiness has to provide not so much manifestation of motion qualities – strength, speed, endurance – as to form comfortable conditions for demonstration of specific skill among athletes-dancers [1].

At the same time, the development of functional systems should not contradict with specific manifestations of the couple's artistry

such as aesthetical perception of dancing. It is observed the most distinctively in the specificity of respiratory reaction, notably regulation of increased frequency of breathing as well as other external manifestations of an organism's reaction to load.

Synchronization of the couple's fitness level is the problem of training dancers. The researches approved that even under conditions of quality technical, physical or choreographic training, the problems in the couple's fitness level emerge at the level of functional support for special physical fitness.

In the course of competitive activity, it is manifested during the period of complicated transitional processes that include practicing the functions, stable state, and capability for fatigue compensation.

The issues of improving special functional capabilities require consideration of not only patterns and individual peculiarities of male and female partners' fitness level.

The variations of kind of competitions in sports dances, specifically the existence of Latin American and standard (European) program require differentiation of approaches to selecting the criteria of functional fitness level and, as a result, means and methods of providing and realization of functional fitness level.

Obviously, it mostly refers to the selection of working regimens and the structure of supporting and special exercises. It is related to the fact that tempo-rhythmic structure, emotional filling of dancing, demands to standardization of kinematic and dynamic characteristics of work considerably vary.



Considering this, at the specific stage of realization of the general methodological approach to choosing the means and methods of managing functional support for special physical fitness, the means for providing functional training among athletes-dancers of different specialization considerably vary.

This concerns the selection of quantitative and qualitative characteristics of functional fitness level, means for their registration, assessment, and interpretation of indicators.

This way, the means and methods of managing the training process among athletes-dancers gain wide popularity and are based on objective criteria of quantitative and qualitative characteristics of fitness level, ways of their registration and implementation into the structure of special training in sports dances.

Modeling based on firmly established criteria of training and fitness level providing interrelation between the managing components and selection of the most efficient regimens of training work belongs to the means and methods of solving the mentioned problems the most.

The development and realization of the system approach in the system of modeling the fitness level demonstrated high efficiency in many sports [2, 4, 5, 7].

Implementations and usage of modeling promoted solving the general problem of sports training when increasing the amounts and intensity of training process stopped serving as a factor of boosting sports skill. It was especially manifested at the level of training athletes of high qualification.

According to the opinions of the prominent specialists in functional fitness level, the possibilities for increasing specialized focus of the training process, in which the improvement of mechanisms of functional support for special physical fitness plays a specific role, are currently considered as such key mechanism of improving the efficiency of training process.

In this case, the research and methodological principles of modeling, its theoretical, constructive, and implementing components are considered as one of the most efficient instruments of realizing this process.

In sports dances, the forms of modeling mostly lean on the empirical basics by specialists-practitioners. They refer to forming the models of fitness level based on the assessment and interpretation of competitive activity indicators.

Modeling functional fitness level usually leans on the traditional idea on the forms and content of the model and copies the models of other sports in many respects [14, 16, 17].

In the course of improving training in sports dances, the problems of modeling functional fitness level are solved with no consideration of the competitive activity specificity or the athletes' skill, notably specific manifestations of choreography and aesthetics of the sport.

The results of the conducted researches are mostly focused on generalized characteristics of the functional intensity and capacity of energy supply as well as the cardiorespiratory system's response that are not likely to provide characteristics of special manifestations



of the dancers' functional capabilities.

Due to this, the methodological principles and methodological approaches related to them making it possible to form the models of functional fitness level based on specific characteristics of functional support for special physical fitness are of a considerable importance.

Conclusions:

1. It was shown that modeling functional fitness level among athletes-dancers constitutes a technologically complicated process based on interrelation and consideration of the structural components of the competitive activity model, the skill model, as well as quantitative and qualitative characteristics of functional fitness level are related to each other and have an impact on athletes-dancers' skill.

2. Creation of scientifically-substantiated experimental base of researches including quantitative and qualitative characteristics of the model structure requiring systematization of the means and methods of control, assessment, and interpretation of functional characteristics of fitness level, forms and aspects of practical usage of the modeling results in the system of training in sports dances.

3. It was shown that modeling fitness level in sports dances is a considerable reserve of improving the training process efficiency among athletes-dancers. It is possible by virtue of realization of modeling as a system component of managing the training process among athletes-dancers.

4. The scientific and empirical preconditions for improving modeling in sports dances were reported on.

5. It is shown that modeling in

sports dances requires using the general principles of the system approach, its implementation as a model-target approach for research and methodological substantiation and forming the process of modeling in the system of sports training among dancers.

6. Exemplified by the algorithm of forming morphofunctional models of athletes-dancers, the succession of actions in the course of modeling functional fitness level were demonstrated.

7. The structure and algorithm of realization of modeling special functional fitness level in sports dance were developed:

1) structural organization of the analysis aimed at forming the system approach to modeling sports training; 2) specific principles of forming a system approach to modeling the athletes-dancers' fitness level; 3) structural and logical scheme of modeling functional fitness level among athletes-dancers; 4) characteristics of models of the athletes-dancers' fitness level; 5) supporting means for modeling the athletes' fitness level in sports dances.

8. The system approach was developed based on the model-target approach of realization of modeling as the function of managing special functional training among athletes-dancers.

9. Forming the structural components of the model-target approach requires consideration of the specific components of training and fitness level inherent for the sports combining sport and arts.

10. Structural and logical scheme of realization of the model-target approach includes the algorithm aimed at forming program support for special



functional training in sports dance.

11. The instruments of providing modeling of training in sports dances were reported on. They include the means and methods of forming quantitative and qualitative characteristics of modeling, ways of control, assessment, and interpretation of indicators, and substantiation of the

targeted realization focusing in modeling the system of sports training among dancers.

Prospects for further research consist in developing general, group, and individual parameters among athletes in sports dances in accordance with the athletes-dancers' age, gender, and qualification.

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Information about the authors:

Ihor SORONOVYCH

candidate of sciences in physical education and sport,
chief of the department of
choreography and dance sports
National University of Ukraine on
Physical Education and Sport,
Kyiv, Ukraine
ORCID: 0000-0001-7519-5322
E-mail: soronovych@ukr.net

MU Chenguang

research student
National University of Ukraine on
Physical Education and Sport,
Kyiv, Ukraine
ORCID: 0000-0003-0080-2794
E-mail: soronovych@ukr.net

HUANG Di

research student
National University of Ukraine on
Physical Education and Sport,
Kyiv, Ukraine
ORCID: 0000-0002-7245-4023
E-mail: soronovych@ukr.net

Andrii DIACHENKO

doctor of sciences in physical education and sport, professor
chief of the department of water sports
National University of Ukraine on
Physical Education and Sport,
Kyiv, Ukraine
ORCID: 0000-0001-9781-3152
E-mail: adnk2007@ukr.net

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