

## Pedagogical Modeling of the Competitive Activity of Athletes in Russian Lapta

Rashida G. Gabdrakhmanova<sup>a</sup> and Aleksandr Y. Kostarev<sup>b</sup>

<sup>a</sup>Kazan (Volga region) Federal University, Kazan, RUSSIA; <sup>b</sup>Bashkir State Pedagogical University the named after of M. Akmulla, Ufa, RUSSIA

### ABSTRACT

The rationale of the problem stated in the article is defined by the fact that in the sphere of sports modeling is a new method of investigating of the work-out sessions construction on the basis of the definition of the different characteristics of sports training and rational methods of its structural parts construction. The purpose of the article is to develop pedagogical modeling in competitive activity of athletes on the example of Russian lapta. The leading method of research of this problem is the modeling method that allows considering this problem as a targeted and organized process and corresponds to the specificity of competitive activity in the Russian lapta. The structure of the provided pedagogical model includes a number of elements: external and internal factors that determine the functioning of the modeled object; training process; playing activities; control unit; set of criteria of effectiveness of lapta players training assessment. Quality of the developed model is expressed in a logical relationship of its structural elements, correspondence of the model to the specific conditions of its implementation, flexibility of the model to make the necessary adjustments to the training process. The model is aimed at improving the efficiency of competitive activity in the Russian lapta, which is a system formed of a plurality of elements that are in conjunction with each other and have a common goal - to increase the impact of competitive activity by the directional pedagogical influence to the components of the sports fitness players condition.

### KEYWORDS

Modeling, pedagogical model, competitive activity, athletes, Russian lapta

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CORRESPONDENCE Aleksandr Y. Kostarev

✉ kostarev21@mail.ru

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## Introduction

In the modern cognitive theory modeling is regarded as a leading research method to identify the relationship between the main factors, features, terms and conditions, structural elements of complex self-developing systems (Morozov, 2002). Modeling is one of the most common modern categories of knowledge and study of complex system objects (Asanova, 2002). At the present stage of development of pedagogical science modeling is becoming one of the leading methods of research that is due to the increased dynamics of the socio-cultural processes in the Russian society, variability of pedagogical phenomena. Despite the fact that the discussed method is widely represented in the sphere of education, researchers are paying insufficient attention to the problems of pedagogical modeling in sport.

Analysis and synthesis of theoretical sources indicate that psychologists, educators, anthropologists, historians of culture, art historians, philosophers, sports researchers worked and studied the complex phenomenon of a game.

Theoretical mark make possible the consideration of issues related to pedagogical modeling in competitive activities in understudied team sports, in particular, in Russian lapta. The works (Grigoriev, 1988; Valiahmetov, 1997; Germanov and Gotovcev, 2003; Kostarev, 2004) focus on the rules of Russian lapta, teaching the players various technical attack and defense actions. However, these works have not studied pedagogical aspects of modeling in competitive activity, model characteristics of different qualification athletes are not described.

The sports science updated integration principle in the creation of the theory of sport games. In sport games in competitive activity system-structural and activity approaches are implemented, it can be noted both during the theoretical analysis and interpretation of experimental data and the factors of competitive activity.

Pedagogical modeling concept of competitive activity in the Russian lapta is based on an interdisciplinary, personal-activity, systemic-structural approaches, determining the possibility of constructing a pedagogical model of teaching as a complex social phenomenon, the search of the algorithm of the modeling based on the identification of the general laws and specific features of this process in any field of knowledge.

## Materials and Methods

### *Research methods*

During the research the following research methods were used: analysis of psychological and pedagogical, sports literature on modeling, pedagogical modeling and synthesis, pedagogical supervision for competitive activity of lapta players, analysis of trainers' professional activity product (instructional documents for work-out sessions planning, training diaries, programs, reports) design, method of expert evaluations, pedagogical control over play activity and studying and work-out process; testing (physical, technical and tactical, functional, psychological fitness); pedagogical experiment; methods of

mathematical data processing (systematization of experimental data, correlation analysis).

### ***Experimental base of research***

Pilot testing was carried out at the Faculty of Physical Education of the Bashkir State Pedagogical University; the Bashkir State University; in pedagogical colleges of Kumertau and Tuimazy of Republic of Bashkortostan; PE technical school Sterlitamak of Republic of Bashkortostan; Ufa Children's and Youth Sports School № 14 of Republic of Bashkortostan, Children's and Youth Sports School of Blagoveshchensk of Republic of Bashkortostan; Ufa secondary schools and high schools №№ 5, 18, 38, 82 of Republic of Bashkortostan.

### ***Stages of research***

The study was conducted in three phases:

- at the first stage - the preparatory stage - the current state of the viewed problem in the pedagogical theory and practice was analyzed; a program of research methods was developed; peculiarities of pedagogical modeling in sport were determined, the necessary conditions for the implementation of this process were defined;

- at the second stage - the main stage - the pedagogical model of competitive activity was developed and implemented in practice; pedagogical supervision over the work-out session of lapta players was conducted for more in-depth and detailed study of the features of the game, experimental work was carried out to verify the effectiveness of this model;

- at the third stage - the final stage - systematization, comprehension and generalization of experimental work was carried out; verification of the effectiveness of the pedagogical model in competitive activity proposed by the author, theoretical conclusions were defined; processing and clearance of the obtained research results were carried out.

## **Results**

### ***Structure and content of the model***

The developed pedagogical model of the competitive activity in the Russian lapta includes several building blocks. Drawing 1 shows the general structure which is to be included in pedagogical model.

The basic structural and functional elements of the model are the following interrelated components: 1) the work-out and study session; 2) play activity; 3) internal factors that determine the functioning of the modeled object; 4) control; 5) a set of criteria for evaluating the effectiveness of training of lapta players; 6) external factors; 7) the conditions for model implementation.

Work-out and study session block: on the one hand it is directly determined by the individuals (the coach and the athlete) and the organizational structure, on the other – it is provided by the administrative and scientific and methodical work of the coach in full and in complex, which defines the content of the training, its goals, objectives, stages, levels, forms, methods, conditions, subjects of the training process.

Block of the play activity consists of a large number of competitive exercises - techniques and tactical actions that are performed repeatedly in order to achieve a victory.

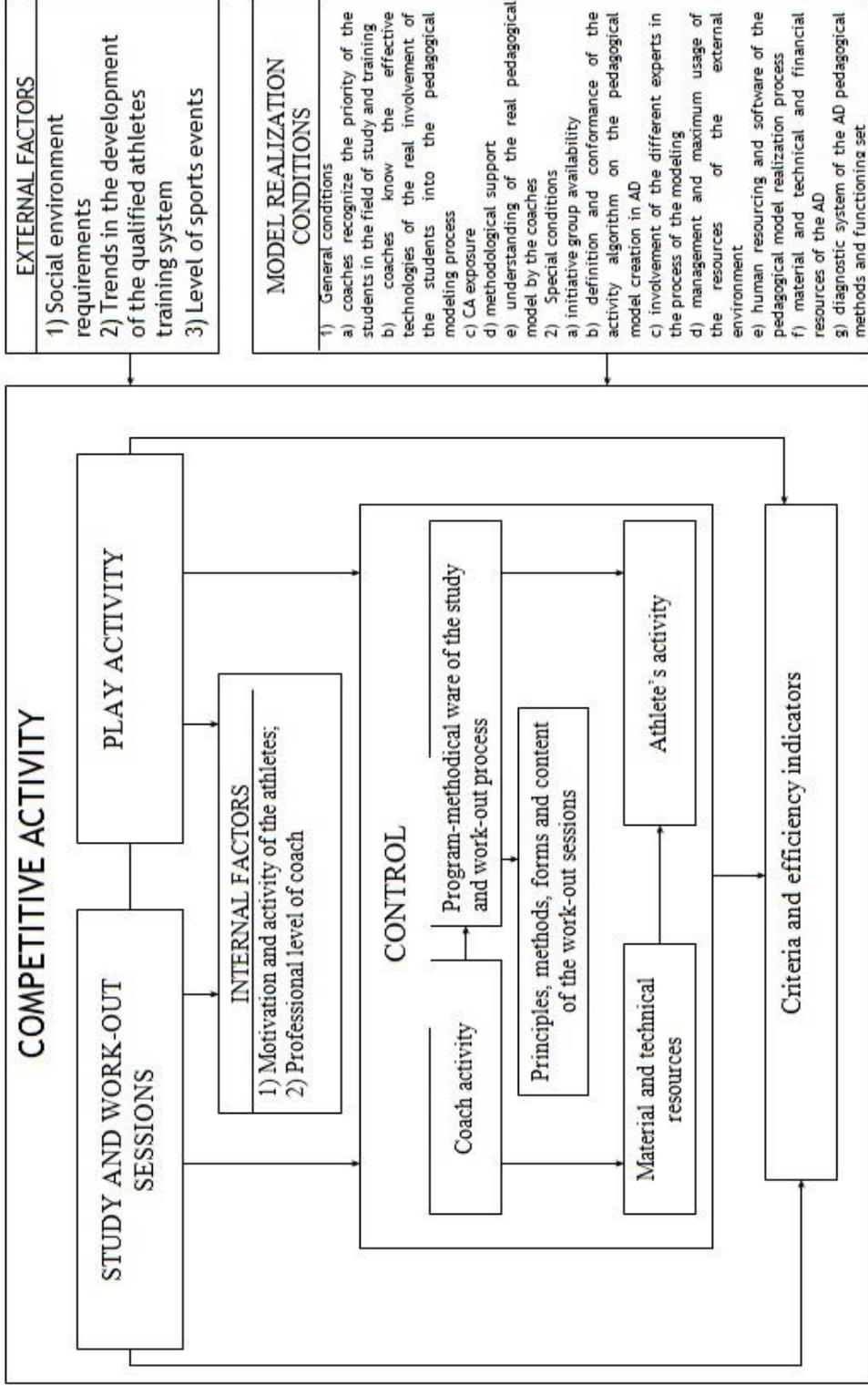
Internal factors block. It includes motivation and activity of the athletes, professional and specially trained coach.

Control also should be defined as a separate block, which is due to its important role in the organization of any pedagogical process, including the preparation of athletes.

The block of criteria and indicators of the effectiveness of lapta players training, includes the results of competitive activity and indicators of technical and tactical skills expressed in certain parameters (space-time, quantitative and qualitative).

Block of external factors: a) the requirements of the social environment (search for new means and methods of physical education of the younger generation); b) trends in the development of the qualified athletes training system, the need to broaden the scope of research due to the absence of evidence-based methods of players training; c) the level of sports events (the annual expansion of the scope and level of competition, an increase in the number of participants).

Conditions of model realization represent several groups, one of which includes the conditions necessary to start the modeling process, and the other three correspond to a particular stage of the process and ensure the creation of a pedagogical model in competitive activity: the conceptual, normative, iconic (the real). In a given set the conditions for each particular step of the process and general conditions ensuring the realization of some or all stages of the modeling can be shown.





**Figure 1.** Pedagogical model of the competitive activity in Russian lapta

One of conditions is that the implementation by the coaches of a specially organized activity on the formation of the athlete developing environment in which training and improvement of physical qualities in Russian lapta are naturally connected to the national culture of the native land. This foundation allows better understanding of the opportunities and implementation in a future pedagogical model the specificity of the social and natural environment, to compare with the analogs and demonstrate special and unique in the competitive activity of the lapta players.

Concept foundation of the model in the competitive activity of the lapta players requires the determination of principles causing the effective functioning of any educational system as well as reflecting the special features of the modeling in the sport games. The system of education and training understand the principles as "guidelines", or "basic rules". The practical importance of the principles is that they allow following the target, excluding the way of trial and error, reveal the logic of solving the problems and outline the main rules for their implementation. The principles of consciousness and activity, the regularity and consistency, accessibility and personalization, the strength of knowledge and all-round development of the cognitive power, the collective nature of training and understanding of individual features are the main principles in our opinion. The principles of training are closely linked: none of them can be fully realized if others are ignored.

Developed conceptual pedagogical model corresponds to the specificity of competitive activity in the Russian lapta. The quality of the developed model is expressed in a logical interdependence of its structural elements, accordance of the model to the specific conditions for its implementation, exposure of the model allowing to make the necessary adjustments in the training process.

### ***Stages of implementation of the model***

The introduction of this model suggested the next stage of experimental work.

#### ***The establishing stage***

During the research we used different types of observations: direct, because the author was carried out the management of the picked team of the Republic of Bashkortostan and the participation in experimental work as a player in the competition and in training; mediated (indirect) monitoring of competitive activity of the teams, participating in the All-Russian, republican, regional and district competitions, the Russian championship, the championship and the Cup of the Republic of Bashkortostan among men and women teams, Bashkortostan Republic championship among junior teams. More than 200 games which involved 425 players of various skill levels and gender were verbatim recorded and analyzed.

In addition, pedagogical observation of the training process of lapta players of different qualifications and gender, for deeper and detailed study was carried out. Lapta players from 14 to 40 years old of different skills were supervised: the students of secondary schools, Children's and Youth Sports Schools, masters of sports teams.

Ordering of the material obtained led to the conclusion that the competitive activity in Russian lapta is a system formed of a plurality of elements being in a structural relationship with each other and forming certain integrity.

Structure of competitive activity in the Russian lapta is formed as an open

dynamic system consisting of interconnected and interacting subsystems: the play activities and training process, united by a common goal - to increase the impact of competitive activity by the directional pedagogical influence on the components of sport fitness of the players.

Using pedagogical observation method, we identified functional, dynamic and component and target-oriented levels of play activities in Russian lapta.

- functional level in a clear and coherent form reflects the quantitative and qualitative unity, expressed in the form of a complex multi-level system, and includes a game episodes that were divided by us into elementary, easy, medium, difficult and highly complex; game phases of attack and defense; game situations (standard and custom) and game activities;

- the dynamic level reflects the quantity and quality of game situations in the phase of attack and defense, in standard and non-standard game situations, spatio-temporal structure of technical and tactical actions and also determines the efficiency of the organization of attack actions in the structure of competitive activity of the competing teams (winners and losers);

- component and target-oriented level defines the scope, diversity, activity of technical and tactical actions and their effectiveness, as well as the dynamics of the effectiveness of key components of competitive activity in the final tournaments of different levels (youth, picked teams of republics, territories, regions).

On the basis of data research of competitive activity model characteristics of play activity of the athletes- lapta players were designed. Three developed levels of the models of play activity of lapta players will improve efficiency control of improvement of technical and tactical skills of athletes of different skills.

A minimum model shows the indicators of youth teams of low qualification, stage model reflects performance of play activity of teams of medium qualification; the reference model is based on the analysis of the play activity of the leading teams in Russia, that is, highly skilled teams. The developed model characteristics of play activity allow a comprehensive assessment of the success of lapta players of different specializations and the teams in general, for objective definition of the positive aspects of fitness, to make appropriate adjustments in the training process.

### ***Forming stage***

Forming pedagogical experiment was carried out in vivo, comparing the data of the experimental and control samples in several stages. For the experiment on the basis of preliminary testing two homogeneous groups of 10 people were made up. The experimental group included the students of Bashkir State Pedagogical University and the control group - the athletes of the picked team of Ufa. The experimental and the control groups had the same number of work-out sessions. The difference between the groups was that teaching and training material, structure and content of microcycles for experimental part were formed according to the models of training tasks, play activity of lapta players. In the control sample, the training process was carried out by the usual method of lapta players training (using standardized exercises) and the recommendations of the special literature.

Training programs proposed by the author differ from traditional construction of the training process in the Russian lapta since the physical and technical and tactical fitness are considered in unity which allows to optimize the training sessions.

### *Experimental verification of the effectiveness of the proposed educational model*

As a result of the pedagogical experiment there have been significant changes in the level of special physical fitness of the participants of the experimental sample (table 1). During the experimental sample it was applied to 70% of training tasks, simulating the activities of lapta players, namely the basic levels of play activities. 35% were for the first two levels, because in these game episodes and phases the main task of the game is solved (in the attack - to make productive advance, in defense – strictly tag out the advancer).

**Table 1.** Indexes of experimental and control samples fitness level

No	Tests	Research period	Experimental samples $x \pm m$	Control samples $x \pm m$	R
1.	Running 30 m (s)	Beginning of exp. End of exp.	4,43±0,03 4,28±0,02	4,45±0,04 4,43±0,03	>0,05 <0,01
2.	Running 60 m (s)	Beginning of exp. End of exp.	7,49±0,06 7,31±0,11	7,50±0,05 7,49±0,04	>0,05 <0,05
3.	Running 140 m (s)	Beginning of exp. End of exp.	21,43±0,64 20,13±0,33	21,48±0,38 21,44±0,33	>0,05 <0,05
4.	Running 3000 m (min)	Beginning of exp. End of exp.	10,23±0,11 9,38±0,13	10,32±0,15 9,58±0,17	>0,05 <0,01
5.	5-time jump (m)	Beginning of exp. End of exp.	12,86±0,74 13,29±0,63	12,79±0,53 13,05±0,58	>0,05 >0,05
6.	Staffed ball tossing (m)	Beginning of exp. End of exp.	16,10±0,28 17,21±0,35	16,05±0,44 16,30±0,42	>0,05 <0,01

The gaming activities shows all the advantages and disadvantages of the training process, therefore, the effectiveness of play activities in the training process in sport games is a system-level factor of the lapta players fitness. Analysis of the pedagogical experiment data, associated with the competitive activity of lapta players, shows that the designed models of the work-out sessions, assignments, improve the development of the different sides of special and physical fitness.

There has been a positive dynamics of technical and tactical actions in the competitions of the participants of the experimental sample compared to the control sample (table 2). Increase of the results of the participants of experimental sample compared to the control sample indicates significant level differences of their special physical fitness.

**Table 2.** Indexes of switches in play activity in experimental and control samples

No	Tests	Research period	Experimental samples $x \pm m$	Control samples $x \pm m$	R
1.	Catch-pass the ball	Beginning of exp.	0,84±0,03	0,85±0,02	>0,05
		End of exp.	0,73±0,04	0,82±0,03	<0,05
2.	Catch-tag out the opponent	Beginning of exp.	1,23±0,07	1,23±0,06	>0,05
		End of exp.	1,06±0,13	1,19±0,04	<0,05
3.	Tag out-advance	Beginning of exp.	8,12±0,22	8,11±0,38	>0,05
		End of exp.	7,72±0,19	8,03±0,22	<0,05
4.	Upper strike-advance	Beginning of exp.	1,12±0,05	1,15±0,04	>0,05
		End of exp.	0,93±0,08	1,13±0,02	<0,05
5.	Advance-jump	Beginning of exp.	8,48±0,12	8,51±0,09	>0,05
		End of exp.	8,01±0,08	8,48±0,06	<0,01
6.	Tag out-ball pass	Beginning of exp.	2,88±0,22	2,79±0,18	>0,05
		End of exp.	2,25±0,13	2,68±0,12	<0,01

Analysis of the results of pedagogical experiment allows us to conclude that group and individual training programs taking into account to the play activities of defenders and attackers can be effective means to improve sports skills of lapta players.

The pedagogical experiment focused on the content and quality of the training process, the tasks were set to approximate the level of the training process to the play activities by means of the pedagogical models of training sessions in microcycles developed by the author.

Thus, along with the volume and intensity, an important criterion for the formation of technical and tactical skills of lapta players was a recreation of rhythm and tempo pattern of the play episode, increase to a reasonable limit the speed of the main components of the play activities that give an advantage in the game, and the formation of the reliability of performance of the gaming actions in extreme situations.

Pedagogical experiment confirmed the assumption that the attention paid to the quality of the training process that is as close as possible to the play activity will improve the technical and tactical skills of lapta players.

## Discussions

The problem of modeling was considered by researchers in the philosophical and methodological, technological and other aspects of education theory R Shannon (1978), V.A. Stoff (1966). Various aspects of pedagogical modeling were studied by A.A. Anoshkin (1998), A.V. Tomiltsev (1997), E.N. Stepanov (2001). The ideas of training process control and individualization of athletes training using the modeling characteristics of competitive activity was considered in works by I.N. Alyoshin (2007), V.V. Kuznetsov, A.A. Novikov and B.I. Shustin (1995), V.M.

Shulyatiev (1997), B.N. Shustina (1998). The essence, structure, methods and means of training process were investigated V.K. Balsevich and Shestakov (2008), S.N. Elevich (2009), Y.S. Voronov (2009), L.P. Matveyev (2005). At the same time, the issues of the pedagogical modeling in the field of sport remain slightly studied, particularly in competitive activity in Russian lapta.

### **Conclusion**

It was found that as a result of research of competitive activity and on the basis of the data obtained a pedagogical model of competitive activity has been developed, which consists of several structural blocks: the training process; play activities; internal factors that determine the functioning of the modeled object; control unit; set of criteria assessing the effectiveness of lapta players training; external factors; conditions for the implementation of the model.

Developed conceptual pedagogical model corresponds to the specifics of competitive activity in the Russian lapta. The quality of the developed model is expressed in a logical relationship of its structural elements, accordance of the model the specific conditions for its implementation, exposure of the model to make the necessary adjustments in the training process.

In view of the results of this study a number of scientific problems and promising areas can be defined, which require further consideration: search of methods for preparation of reserves of skilled lapta players remain relevant; long-term preparation of athletes; studies on innovative approaches to the content of training programs for Russian lapta are promising and popular; training experts in sports activity.

### **Recommendations**

Research materials may be useful in the work of coaches of Children's and Youth Sports School; coaches of the picked teams in Russian lapta; PE teachers of higher and secondary educational institutions; physical education teachers of secondary schools; trainers of sports clubs and athletes.

The following practical recommendations aimed at building a pedagogical model in sports, and in particular in the Russian lapta are unconditionally interesting:

- determination of the actual environment (competitive activity), where the studied process takes place;
- identification of external and internal factors, the conditions governing the operation of educational model;
- specification of the subjects of competitive activity and its functional characteristics;
- indicators of technical and tactical skills of athletes (space-time, quantitative and qualitative) developed by the author and expressed in certain parameters

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No potential conflict of interest was reported by the authors.

### Notes on contributors

**Rashida G. Gabdrakhmanova** is PhD, Associate Professor of the Department of Education and Upbringing Methodology of the Institute of Psychology and Education, Kazan (Volga region) Federal University, Kazan, Russia.

**Aleksandr Yu. Kostarev** is PhD, Professor, Dean of the PE Faculty of <sup>b</sup>Bashkir State Pedagogical University the named after of M. Akmulla, Ufa, Russia

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