THEORETICAL AND METHODOLOGICAL FOUNDATION OF THE PROCESS OF STUDENTS' PHYSICAL TRAINING OF HIGHER EDUCATIONAL INSTITUTIONS

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Annotation. Efficiency of the existent system of physical education is considered in the higher institutes of Ukraine. Information of unsatisfactory level of physical preparedness of university entrants and graduating students of higher institutes is resulted. The lacks of construction of process of physical education are shown on the basis of normatively-command approach. Absence of the programs, which take into account motivation and terms of activity of higher institutes, disparity the requirements of integration in the river-bed of the Bologna Process, is shown. The analysis of publications is resulted in accordance with the modern scientific paradigm of construction of the system of physical education of students on the basis of methodology of synergetics. Information of the questionnaire questioning is utillized in research. Cross-correlation connections are presented between elements of physical education systems, which influence on efficiency of process. The basic requirements of construction of process of physical education of students of institutes of higher are set.
Key words: curriculum, foundation, motivation, system, programming, modeling.

Introduction

Analysis of special scientific-methodological literature witnesses, that many students show no desire to physical exercises. The main reason is absence of differentiated approach exercises and loads, which are proposed to students, absence of stimulation for trainings. Talks about usefulness of physical culture for students' health are rather abstract, in connection with the fact that there is no objective criteria, which could be used at classes, and the presence of students' theoretical unreadiness [6]. The system of physical education has both: no specific, expressed by objective criteria, purpose and information about how every specific result can be used for achievement of final target [19].

The problem is that in higher educational institutions of Ukraine national system of physical education process is acting; it is built on the base of normative approach and this distinguishes it from European one. At the same time, it is important that more than 50% of students have low physical level [12], and more than half of graduates are not physically able to work with good quality [16].

There are already proved data that last time insufficient physical level of applicants, who want to be the first year students of higher educational institutions, have been being observed. Their level of physical preparedness is lower than middle (75% of girls and 74% of boys) [1]. It requires considering the level of students' general physical level with creating system of physical education.

According to our data, each of applicants did not fulfilled test with 5 points mark, as per the norms of state testing.

The existing at higher educational institutions system of physical education is built on the principles and programs, taken from sports training programs, which are not adapted both to the process of physical culture formation and to the conditions of higher educational institutions' operation. The result of such incurring is normative basis, for which personality is of secondary character and average normative indicator is of the first importance. Person with individual features is of significance only as a mean of reaching a certain sport aim.

The conducted content-analysis of students' physical education program-normative provision showed its non-compliance with the requirements of practice and physical education, which could correspond to Bolognese process.

Actual life requires considering of demands of labor market, market economy, modern views on life in micro-social medium with forming of program-normative foundations of students' physical education.

The existing physical education system in CIS and Ukraine higher educational institutions is characterized by already existed subjective-objective relations between teacher and student, which are similar to relations in army, and by the character of these relations, i.e. by hard pedagogical control of the subject (teacher), who must know exactly, what skill and knowledge shall be given to a student for him to meet already determined lest of professional qualities.

Integration of national system into international educational space, realization of main tasks and measures, which were specified by Dakar (1999) and Paris (1998) international forums, by Lisbon project and Bolognese declaration, has its pedagogical peculiarities in credit-module technology of education as well. Categorical imperative of humanistic approach's pedagogical paradigm in education is personality – the highest value of society [2; 4; 8; 9].

Credit-module technology of education contains two didactic conceptions of credit and module, which substantially influence on formation of holistic algorithm, mastering of knowledge and skills of physical education and subordinate other educational components – forms, methods, means, etc. to their requirements.

According to program-normative principles, students' physical education shall be based on specific principles of credit-module technology of education: humanization, democratization, crediting, modularity, individualization, differentiating, integration and so on.

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Student, as a self-organized social-psychic subject, is in the center of system model of physical education. It defines control parameters of dynamics of all physical education process as a system.

At the same time, modern scientific paradigm, which is now being created, requires transferring from system to system-synergetic methodology of physical education process's constructing, and it is a response to post-modern trends in science and practice [3].

Synergetic, being a science about processes of development and self-organization of complex systems of different origins, inherits and develops inter-disciplinary approaches of its predecessors: technology of A.I. Bogdanov, theory of systems by L. Von Bertalanfy, cybernetics by N. Viner. At the same time, it differs significantly by the fact that its language and methods rest on achievements of non-linear mathematics and those natural and technical sciences, which study evolutional processes of complex systems [5; 15].

It is necessary to improve the technology of physical education's development, to eliminate excessiveness and extra detailing of professional demands, tasks and abilities.

It is necessary to determine such new forms of self-organization on every stage of process, which meet requirements of production development, society, by opening regularities and ways of transformation lower self-organization forms into higher ones.

The resulting principles of theoretical general foundations, methodology of physical education [7], by which organization forms and training methods shall be the basis of physical education. Didactic principles are divided into two groups: general, which concern educational process in the whole. The first part of principles concern the content and methods of physical training, i.e.: principles of accessibility, obviousness, connection with practice, professional orientation, scientific character. The second part of principles is closely connected with studying of students: their activeness and independence, systemic and step-by step character of studying, level of knowledge mastering, combining of studying with scientific activity.

The special principles in physical education system are as follows: technological character of creative process of modern scientific-practical knowledge and information mastering in the form of computerization, i.e. realization of computer-aided, algorithmizited, reproduction forms of scientific-educational activity in computer system of information processing for facilitating of unlimited opportunity of cognizing profoundness, operating of data bases, information about nature, man, etc.

One of the first priority principles of physical education is principle of "advanced development" of students' physical education, comparing with the dynamic of future professions' development, demands of future specialties. Advanced relations of other professional, social structures is an orientation on increasing of prognostic approach on the base of urgent mastering of professional, social and educational information; social, professional relations; peculiarities, in which social-professional features are realized as well as social purpose of physical education system. Its realization is possible if feedback with all subjects and objects in conditions of harmonic interlink is present as well as innovative, scientific search connection with educational process, professional formation and perfection of specialists.

O.M. Knyazeva shows the possibility of non-traditional view at historical development of scientific knowledge, basing on synergetic models and methodological consequences, and with it she introduces purely new vision of world and understanding of development processes in it [5].

There is also necessity of studying the processes of transition into qualitatively new statuses, and it really caused appearance of new scientific branch, which has inter-disciplinary character. I. Prygozhyn and G. Haken [13, 15] became the founders of this branch.

From the problems, which are studied by synergetic, the most important are the processes of complex systems' development. There are two stages in their development. The first stage is characterized by stability; in all its duration there is no qualitative, principal changes of system's state.

Evolutional processes are strictly determined; the future statuses are quite predicted, if general trend of development is revealed. However the system's being in stationary status requires certain inner and external interactions, which permit the system to maintain inner balance with its lack of equilibrium with environment. For biological systems such interactions are called homeostasis. In the case of non-organic systems' development, inner balance is maintained either by constant production of energy inside the system or by constant energy supply from outside. .

But under the influence of external action or as a result of inner contradictions stationary status sooner or later ends; new stage of system's development starts, which is characterized by loss of inner balance. From such crisis state only transition into new possibly, qualitatively stable status is necessary. The crisis parameters of a system are called critical point of development. The following crisis stage of development ends by transition into qualitatively new status by one of two possible ways: either by destruction of settled system or by constructive transition into stable status with higher level of organization, than in previous state.

Potentially possible bifurcation of system's withdrawal from crisis state (destructive or constructive) brought new term "bifurcation point". In synergetic its sense a little differs from its mathematical expression, accepted in literature. In his Nobel prize lecture I. Prygozhyn gave the following synergetic understanding of bifurcation: "…revelation of bifurcation phenomenon introduced an element of historical approach into physics… Any description of system, which passed bifurcation, requires involvement both probability and determinism. Being between two points

of bifurcation, system develops logically, while close to bifurcation points, fluctuations become important, because they show, which of curve branches will be determined by system's behavior" [13, c. 111].

This means that on crisis stage of system's development unambiguous evolution way, which was characteristic for its previous, stationary status, ends. Several branches of potentially possible development continuation in after crisis state appear. The quantity of such transitions is determined by peculiarities of the developed system and conditions of its interaction with environment. "Choice" of one of the branches is caused by influence of one of fluctuations, which appeared at that period of time.

Withdrawal from crisis is considered constructive, if system gains qualitatively new status with higher level of organization than before bifurcation. Such transition can occur in the form of giant collective fluctuation, with which system's elements, which previously were able only for chaotic short-range actions, suddenly become able long-ranch interactions and it unites all elements into one coherent collective [13].

Under the influence of biological program of development and external factors, at decisive stages of actual development, system enters crisis stage, withdrawal from which takes place in compliance with described above spasmodic transitions into qualitatively new stages. But here a new factor appears that plays leading role in a part of biological orientation of development.

This factor is gene program, in other words, presence of information about future states of organism in organism itself. Programmed withdrawal of biological system from crisis is one of possible self-organization's manifestations. Crisis, which appears owing to external factors, can cause ambiguity of future way, because the quantity of possible ways out is limited. Such crisis states can "knock out" system from stipulated by gene program biological way of development.

Forestalling approach requires principally new understanding of physical education construction.

Most of synergetic specialists develop this methodology as modern base of complex inter-disciplinary researches, because just at junctions of different sciences the most important discoveries take place. Especially it concerns development of new forestalling technologies.

That is why, basing on the above said it is necessary to consider negative consequences of existing programs' implementation. Research of theoretical-methodological foundation of program provision of higher educational institutions students' physical training seems to be urgent.

The research has been fulfilled as per combined plan of scientific & research works in the field of physical culture and sports for 2006-2010 of family, youth and sports Ministry of Ukraine; subject 3.1.8.3 it. "Theoretical-methodological foundations of professional-applied physical training of higher educational establishments' students".

Purpose, tasks of the work, material and methods

The purpose of the research: theoretical & methodological foundation of program provision of students' physical education.

The methods of the research: theoretical analysis of publications, literature sources, generalizing of experience and practice, pedagogical observations, pedagogical experiment, methods of mathematical statistics.

Results of the researches

For researching and development of program provision, we chose an object: higher educational establishment, students of 3rd, 4th year of study – modern intensively developing ДВНЗ УАБС НБУ at Sumy.

Organization, character and content of educational process are determined by principles of Bolognese process. Education is oriented on integration with European space. The questioning on correlation analysis of interconnections of special physical preparedness integrated indicators with elements of motivation's formation permitted us, basing on opinion of certain respondents, to reveal that on the third place ($r = 0,75$) in influencing on physical education efficiency is taken by possibility of choice of kinds of sports, flexible program, stipulating systemic- synergetic application of educational process, constructed on modern, personality-oriented technologies ($r = 0,67$). This is besides such conditions as initial level of preparedness ($r_{cep.}=0,96$), and conditions for sports training at place of residence ($r = 0,82$). The obtained information ensured possibility for development of program material with efficient form of educational process subjects' interaction on the base of transition from administrative and normative organization of educational process to personality- oriented anthropic training technology.

We have developed theoretical-methodic conception of physical education control. Theoretical system of control was built on the base of cybernetic approach [10] and, further, developed in opposite to programming in narrow sense; in larger understanding as dynamic process of problems', arising during training of economics specialists, solution rather than one-time measure.

As a result, the project of systemic transition from analysis to synthesis of students' physical education was developed. With it, separate elements of whole professional-applied physical preparation, first were marked out for analyzing, then they were strengthened and, owing to organization, transferred to new qualitative level, again gathered and were synthesized in the whole.

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Simulation is the process of construction, studying and using of models for determination and specifying of characteristics of any process and its optimization [11].

Model is usually understood as specimen (standard, pattern); in wider understanding – any specimen (imaginable or conditional) of any object, process or phenomenon

Simulation process of physical education envisages:

1. connecting of used models with the tasks of operative, current, stage-by-stage control and managing of different training structural components;
2. determination of model specification's level, i.e. quantity of parameters, included by model, character of links between parameters;
3. determination of models' action time, limits of their usage, order of specifying, finalization and change [11; 18].

Monitoring of physical education process inevitably leads to making several kinds of models: model of physical state for physical exercises, which can include both general indicators and separate – morpho-functional status, somatic health, physical preparedness; models of physical training lesson; models of process – program of physical training. These models can be presented on generalized, group and individual levels [11].

The program also includes research of loads orientation's influence: aerobic, anaerobic (lactate, glycolytic, kreatine-phosphate); aerobic-anaerobic. Also it includes research of influence of exercises oriented on endurance, general or special strength, flexibility and dexterity development [14; 17].

Great practical experience of consideration of adapting and correction in sports permits to use it in the practice of physical education, considering psycho-physiological peculiarities.

For this purpose it was necessary to create models of training influences, exercises, trainings, training cycles and stages in particular; to research physical education management system, which was constructed on manipulating of models.

The process of physical education, for monitoring, shall stipulate descriptions of monitoring models of students' physical preparedness and their actual state at given moment as well as the models of the state, which must be reached. These models shall give digital characteristics of main types of preparedness (general, special, professional, technical and so on). Besides, it is necessary to develop models of main influencing programs, means of development of psycho-physical general and special abilities, exercises, trainings, cycles, stages. It is also necessary to create the system of pedagogical control, which could register the state and efficiency of physical education process, changes in organism and students' preparedness.

Pedagogical system of physical education consists of great number of elements and has numerous connections. With simulating, the process of physical education is regarded as the process of construction of abstract schemas of actual processes for more profound penetration into their regularities, for predicting of possible direction of development. The models of this system are rather complex, but, with the lapse of time, they substantially change.

We used one of modern methods of simulation – meta-simulation. Conceptual model of physical education process stipulates development and application of program, cycles, stages, trainings and means models, which are formed in the process of education and observation over the system's functioning. Models permit to evaluate significance of system's integrity, to reveal its ability to gain the stages, determined by structure.

Conclusions

1. Analysis of the results permitted to make an important conclusion: normative base of physical education innovations shall meet synergetic principle of predictability: to be adapted, mobile system, represented by normative attracting recommendations, which are the mechanism of system's stability, instead of hard regulations.

2. Constructing the process of physical education, it is necessary to base on humanistic approach, anthropic technologies, modern kinds of sports, flexible module system according to professional requirements of a specialty and student career demands.

Exactly these characteristics stimulate appearance of mechanisms, which ensure full fledged functioning of students' physical education system.

3. With it, programming is rather strictly determined system of proved by practice operations and actions, which condition certain result within specified period of time. Checking and monitoring of the chosen conceptions is carried out with the help of analysis.

The prospects of further researches. It is planned to research and develop computer programs for students' physical education process.

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