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Coaching Expertise: Science or Skills?[1]

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Abstract

Today in most of Russian sport universities, the biological disciplines are carried out in accordance with traditional old-fashion ideas that have been formed half a century ago and do not correspond to reality. The sport theory and methods fundamentals are taught only in accordance with the theory of periodization. Sporting theorists neglect many facts of low efficiency in the use of training periodization theory and results of research. They do not take into account the research of some sports specialists who developed and implemented more effective method of training for elite athletes. One of the main aspects that a coach works with is the human organism. The foundation of the training process should be based on the law of development and human adaptation. Most of nowadays existing concepts of sports training ignore system laws of organism functions construction and existing laws adaptation. The laws of adaptation provide a basis for science-based integrated construction of training process. The modern theory and methodology of sports should be built on the basis of current scientific knowledge about the laws of functioning, adaptation, and development of the human organism. Adaptation laws provide opportunities for effective preparation of the athletes.

Keywords: coach professionalism, the laws of adaptation, the theory and method of sports, complex training of elite athletes

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Introduction

The level of accomplished achievements of any athlete is primarily dependent on the professional level of his/her trainer. For some reason, it is assumed that the coach who reached high results as an elite athlete in sports can lead his students to the same high level. However, in sport there is a well-known saying: great athletes rarely can be good coaches!

One of the main aspects that a coach works with is the human body. Therefore, a coach primarily relies on physiological mechanisms of the human body. The foundation of the training process should be based on the law of development and human adaptation (picture 1).

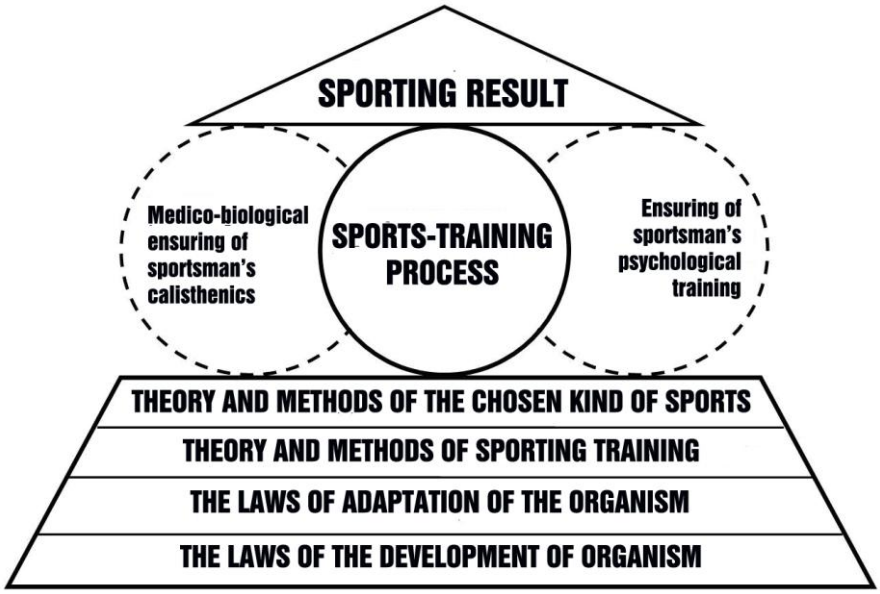

Figure 1. Unity of the component parts of the process of training and preparing athletes (S. E. Pavlov, T. N. Pavlova, 2011)

The laws of adaptation of the human body are described by Russian researcher S. E. Pavlov (2000, 2010, etc.), and their efficiency is proved in practice [S. E. Pavlov, T. N. Pavlova, 2011].

Judging by the numerous publications, the vast majority of sports specialists are absolutely sure that the adaptation process goes according to the «scheme»: «stress - adaptation - disadaption - readaptation».

And the authors of the mentioned above «scheme» made the adaptation process discrete, broken, depending only on the presence of a stressor and this contradicts all laws of Nature. Life is «a continuous adaptation… to life conditions» – I. M. Sechenov (1863). «From a wide biological point of view an organism is always in the conditions of a sequential action developing external and internal factors of its existence» [P. K. Anokhin, 1968].

Nonspecific characteristics of factors influencing an organism (their size) can't be judged without their specific qualities. Moreover nonspecific characteristics of active factors define their specificity. An organism can't react separately to specific or nonspecific characteristics of active factors. But there is no specificity in the mentioned above "scheme" and that is why it is not clear how the process of adaptation works.

«Disadaptation» according to the ideas of the «scheme» creators is opposite to «adaptation» process, which means «destruction» that happens only in case of death. The use of the term «disadaptation» also proves the existing idea of adaptation as a process which happens occasionally. It should be noted that the appearance of such term is closely connected with the idea that adaptation is always the organism achievement to create some positive changes in organism and new possibilities. But this statement is not correct.

The process of «readaptation», according to majority of specialists, means the «return» of an organism to an earlier achieved level of adaptation. But any organism is changeable and that is why all the following adaptation cycles will not be a return to «an earlier achieved level of adaptation».

Thus the «scheme»: «stress - adaptation - disadaptation – readaptation», orienting coaches and athletes to create training processes according to the principle «the more the better» is absolutely absurd from the very beginning. This scheme does not reflect the actual processes taking place in the organism during its continuous adaptation to the ongoing complex environmental factors. The followers of this «scheme» we should address to H. Selye' saying (1960): «There is nothing more harmful for progress than stubborn upholding of one's preconceived ideas».

Adaptation is the process of an organism's specific adjustments to the ongoing complex environmental factors and the process of structural and functional stability is supported by the fully formed functional systems of an organism.

There are following laws of adaptation:

1. The laws of adaptation are the same for all living organisms created according to one image.

2. The laws of adaptation are part of the laws of a person's development, maturity and ageing.

3. Adaptation is a continuous process which stops only if the organism dies.

4. Any living organism exists in four-dimensional space and that is why the processes of its adaptation can't be described linearly.

5. The basis of the adaptation process of a highly organized organism is always the formation of specific functional systems, the adaptive changes in its components are one of the essential «instruments» of their formation.

6. Constitutive factors of any functional system are the final and interim results of its «activity» that defines its absolute structural and functional specificity.

7. Systematic reactions of an organism to a complex of simultaneous or (and) consistent environment effects are always specific and the nonspecific part of adaptation is an important component of any functional system and defines the specificity of its reaction.

8. It is necessary to talk simultaneously about existing dominant and conditional afferent effects but it should be understood that an organism always reacts to the whole complex of environmental effects, forming a unique to the given complex functional system.

9. Each functional system is extremely specific and within this specificity it is relatively labile only at the stage of its formation (the process of an organism's adaptation). A formed functional system (that corresponds to the state of adaptivity of the organism to specific conditions) loses its liability and is stable in case of its afferent part invariability.

10. Any functional system can be formed only on the basis of «preexisting» physiological (structural - functional) mechanisms which depending on «demands» of a definite integral system can be involved or not into it as its components.

11. Functional system components define its «behavior» in general, influencing each other, but a system in general always influences its components.

12. The complexity and extension of «a working cycle» of functional systems has no boundaries in time and space.

13. An obligatory condition for a full formation of any functional system is constancy or periodicity of an influence on an organism of a standard, invariable complex of environment factors which «provides» a standard afferent part of a system.

14. One more obligatory condition is the participation of memory mechanisms.

15. The process of adaptation, in spite of the fact that it goes according to general laws, is always individual as it is in direct relation to the genotype of this or that individual and is realized in the context of this genotype and in accordance to the conditions of a former life of a given organism's phenotype [S. E. Pavlov, 2000, 2010].

Laws of adaptation allow the use of an error-free selection for constructing a training process in any sport. They also allow to chose efficient means and methods of training [A. N. Bleer, S. E. Pavlov, M. M. Kovylin, A. S. Pavlov 2014], that ensure for a steady increase of athletes' sports performance and results throughout their career. The laws of adaptation provide a basis for science-based integrated construction of training process (picture 2).

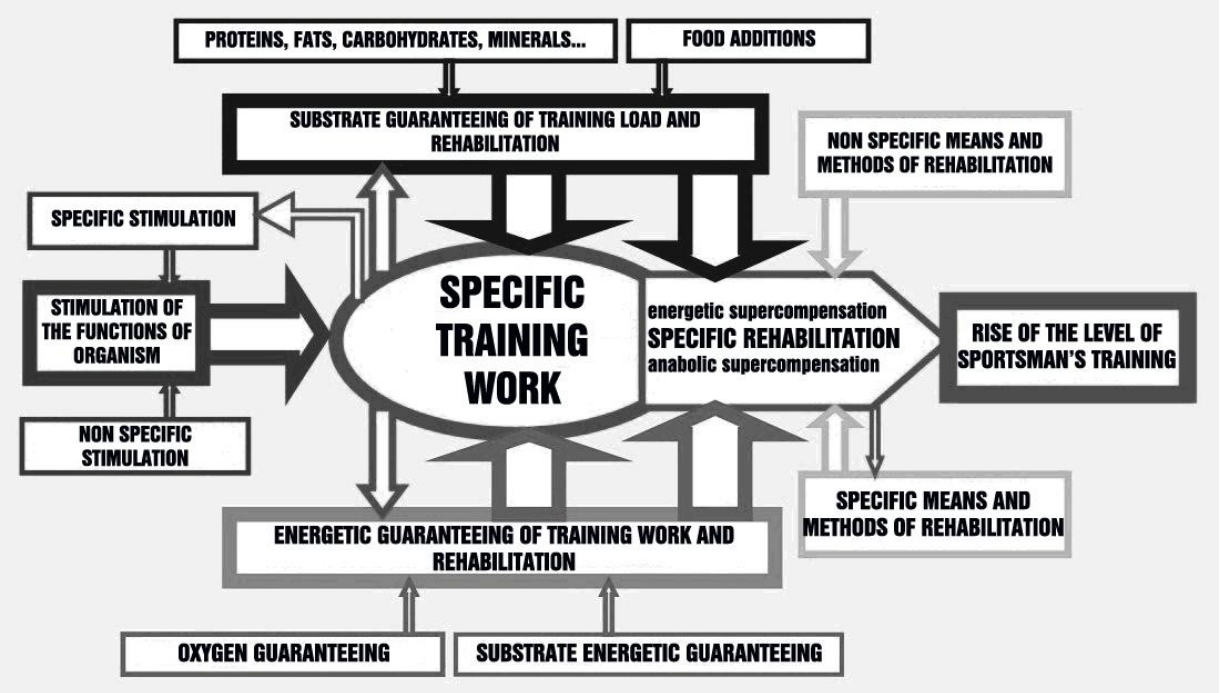

Figure 2. Complex use of rehabilitation means and raise of efficiency in training (S. E. Pavlov, T. N. Pavlova, 2011)

This statement doesn't exclude the use of additional nonspecific exercises in practice, but it should be noted that a transfer of training can either «positive» or «negative» [A. Pavlov, A. Petrov, 2014]. So the group of additional training exercises should be chosen and used in such way that each component of the training process provides only positive transfer of training level in competitive exercises. The key point of understanding the transfer training laws compiles in the system physiology laws and, in particular, in the laws of organism's adaptation. Picture 3 shows the principles of training level transfer.

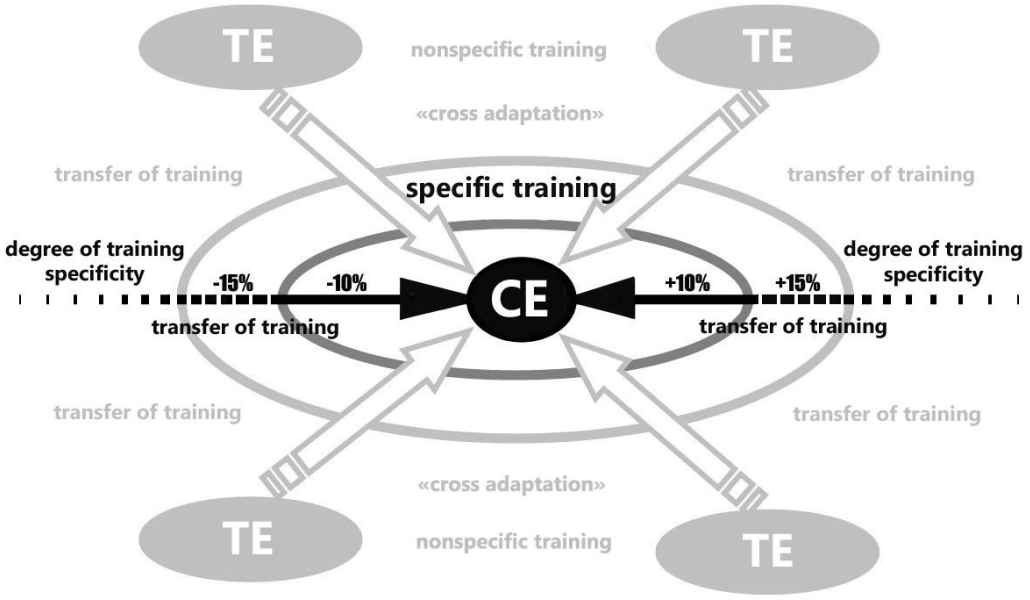

Figure 3. The principles of training level transfer: CE - competitive exercise; TE – additional training exercise (S. E. Pavlov, A. S. Pavlov, 2013)

Automatic positive training level transfer from training exercises to the main competitive exercises should be done in ±10-15% «corridor of specificity» of performed exercises [A. P. Bondarchuk, 2007, 2010] according to an optimal volume of training loads. The use of relatively specific (beyond the 10-15% "corridor of specificity") training exercises provides greater positive «transfer of training». The more specific (concerning the main competitive exercises) they are the better. In this case the main rule for planning and building a training process is the following: the amount of specific training exercises should dominate in the training process.

Materials and Methods

Our research is based on the study of Russian and foreign educational, scientific and methodological literature. We have analyzed and evaluated the teaching level of basic sport university disciplines for students majoring in physical education and sport.

Findings

The results of the analysis have showed some issues in educational, scientific and methodological preparation of modern coaching staff:

1. Biological disciplines such as physiology, biochemistry, etc. are carried out in accordance with old-fashion ideas that were formed half a century ago and do not correspond to reality.

2. Physiological concepts that are ignored lead to mixing and combining of two different terms: physical education and sport. But such terms are in different areas in human culture, they have different objectives and use different tools and techniques.

3. The sport theory and methods fundamentals are taught only in accordance with the theory of periodization developed by L. P. Matveev half a century ago.

4. Most of nowadays existing concepts of sports training (L. P. Matveev, J. V. Verhoshansky, V. B. Issurin) ignore system laws of organism functions construction [P. K. Anohin 1968, etc.] and existing laws adaptation [S. E. Pavlov, 2000, 2010, etc.].

5. Sporting theorists neglect many facts of low efficiency in the use of training periodization theory and results of research. They do not take into account the research of some sports specialists, such as A. N. Vorobyev (1977, 1989), A. P. Bondarchuk, (1989, 2000, 2005, 2010), etc., who developed and implemented more effective method of training for elite athletes.

Conclusion

The modern theory and methodology of sports should be built on the basis of current scientific knowledge about the laws of functioning, adaptation, and development of the human organism. It is impossible to prepare professional trainers, without giving them advanced knowledge in all fields of science that are relevant to the preparation of elite athletes. One cannot expect good results from coaches not knowing modern technology for training elite athletes.

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