

ON THE PROBLEM OF IMPROVING THE PHYSICAL ABILITIES OF THE YOUNGER GENERATION

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Annotation. *Purpose:* identify ways to improve the physical capabilities of children, school children, teenagers and young people enrolled in educational institutions. *Material:* analysis and synthesis of 22 references for the improvement of the physical capabilities of the younger generation. *Results:* found that physical education is an integral and very important part of preparing students for life. Physical education class in secondary schools in any case not be turned into a form of entertainment with elements of locomotors activity. Meeting the challenges of physical education should be on the leading position, especially in working with younger students. In the process of improving the physical abilities of students, physical education teacher must always remember that the most spectacular method of education is a personal example of a teacher. *Conclusions:* optimization studies are actual educational process considering the personal qualities of the expert.

Key words: *young, generation, physical, qualities, fit, physical education.*

Introduction

The article primarily focuses on physical education of school-children, children, teenagers and youth studying at general education institutions.

Recently mass media has been espousing an idea that physical training class at general education institutions should be transformed into a kind of amusement based on physical activity. Thereby, strenuous activity in the course of such amusement should be minimal lest, God forbid, children overexert, thus avoiding the risk of any unexpected functional disorder. And, the thing is that this idea is often welcomed by the leaders of educational sphere including those of the highest calibre.

In such interpretation physical training at school serves as a perfect example of positive feedback control system. Children are physically weak today so they should exercise less. As a result of that they become even weaker which again demands less exercise which in its turn entails even worse results up to complete degradation of the control system. No sane person can be satisfied with such an ending.

Purpose, tasks of the work, material and methods

Research purpose: to identify the ways of improvement of physical abilities of the younger generation.

Research objective: to analyze literary sources regarding possible ways of addressing the issue of improvement of physical abilities of the younger generation.

Research methods: literary sources analysis.

Results of the research

It should be noted that this study covers only one aspect of physical advancement of a person - improvement of his/her health by means of physical exercise to advance his/her physical parameters developing such manifestations of motor activity as strength, flexibility, speed and endurance.

Laypersons dealing with the issue of physical advancement of a person usually confine themselves to this only aspect being unaware of another, more important aspect. Yet, it's not surprising, as it often goes unnoticed even by experts. To make sure of it one should just read a book by Willmore J.H, Costill D.L. "Physiology of sports and exercise" [19]. And as via Bologna process we are currently joining the Western-European educational field such unawareness becomes more conspicuous because, like it or not, we have to lend ourselves to trendsetters.

So, what's that another – more important – aspect? Before we mention it, we should pay attention to one purely psychological factor: when we start following foreign experts, our native outstanding scholars fade into insignificance.

By the latter we mean classical research works by P.F. Lesgaft, M.O. Bernstein, P.K. Anokhin [1, 3, 4, 16]. All thoughtful and interested physical education professionals are familiar with the work of P.F. Lesgaft "The Guidance to physical education of schoolchildren". Peter Frantsevich argued that physical education of schoolchildren should become a compulsory subject at secondary school. There was a reason for him to use a term "physical education". At that time there was not enough research data to argue that, still he knew it from intimate impulse that common *health improvement* achieved by the development of such qualities as strength, flexibility, speed and endurance and *physical education* are, though interrelated, yet different concepts. He was probably also aware of the fact that physical and intellectual educations are also different, yet again interrelated, things.

To date, taking into account the accomplishments of both our native and eastern/oriental psychological science, it became obvious that mind as mental phenomenon is not homogeneous. For instance, in the writings of an outstanding Indian thinker Aurobindo Ghosh we find such types of mind as cellular, physical and vital mind, intellect, intuition and other more sublime manifestations of it that can be perceived only via certain meditative practices [18]. Aurobindo

claimed that materialization of our intentions is performed by physical mind and represents a certain movement system or, in modern terminology, certain physical actions.

Based on this we can say that M.O. Bernstein's classical work "On the Construction of Movements" is actually an attempt to reveal the principles of operation of physical mind. [3]. This means, the existence of physical mind as one of the manifestations of the Mind in general is a fact, a reality. If that's the case, it is appropriate to speak of physical education as well. In saying so a question arises: what is the difference between physical education and, let's say, intellectual education?

Let's first focus on intellectual education. Elementary components of such education are concepts, from the simplest to more complex ones, the latter are constructed from the concepts of smaller complexity by means of synthesis. As a result we have systems of notions that eventually form certain school subjects.

The same is true about physical education but elementary components here are represented not by concepts or ideas, they are represented by neuromuscular conceptions about basic stages of motor activity (physical action), or about physical action in general, or a series of actions integrated in certain system. All that information, as we know, is recorded in neurons of the central nervous system on different levels of physical action construction system. And the more records of such kind a person has the more physically educated the person is. Such person will, for instance, quicker master jobs that presuppose certain specialized motor actions. And as most jobs in the long run are more or less related to motor activity (movements), physical education turns out to be an integral and essential part of preparation of a person for life. To ignore that, to narrow the meaning of "physical culture" subject at secondary schools down to some kind of physically active amusement, plain rest, mere switching over from intellectual to physical activity means something much worse than just ignorance.

There exist a great number of research materials concerning health improvement of children, advancement of their physical abilities, as well as methodological recommendations regarding the intensity of physical exercise with respect to children's individual aptitudes for physical training process to be individual-oriented [6, 9, 20].

On the contrary, little has been done concerning school-children's physical education. And, regarding it in terms of "individual-oriented" categories, we realize that the accomplishments in this field are even lesser. The work in this field has just started. Here our attention may attract a PhD thesis by O. O. Bezakopylnuy [5]. What is interesting about this work? We know that in every motor action it is possible to single out vegetative (autonomic) and central nervous components. These are two poles between which the action unfolds. In the above-mentioned thesis we clearly see that in case of physical training (development of physical qualities) vegetative component dominates, while in case of development of physical abilities and skills (physical education) central nervous component is dominant.

What does it testify to? To answer this question we should deviate from the subject for a while. As far as a man is a product of evolution we identify two kinds of originating principles guiding his life: animal and purely human. It will be interesting for us to see which of those principles dominates in the process of development of physical qualities and which one prevails when we implement the physical education objectives? It is clear that those qualities of a human being that are inferior to wild world speak for animal nature concealed in a man. For thousands years of evolution animal nature has been suppressed by purely human layers. While any superiority to wild world with regard to motor activity testifies to implicit human nature.

And human superiority with regard to motor activity most vividly manifests itself in the ability to master new motor actions, and particularly, the ability to instantly construct motor responses to rapidly changing environment. And it is these abilities that form a basis for human development. Or in other words, these abilities serve as the evidence of the mind, specifically, of the special type of mind that we call "physical mind". This is proved by the fact that central nervous component, as was mentioned above, prevails in the in the process of motor skills development.

It's time to make not only our professionals in physical education but also leaders of educational sphere understand the need for unification of physical education, the way it is done in regard to other general education subjects. If, for instance, we consider chemistry or physics, or any other subject we will see that its content stays the same whether we go to schools in large cities or rural area, similarly, the way this content is taught doesn't change either. This, certainly, optimizes both monitoring and control over the process. While with regard to our subject we face a "super-democratic" approach. It can be explained by lack of necessary content unification on one hand and lack of unified material resources (facilities) on the other. The latter, to a great extent, determines the anarchy of the phenomenon, as a physical culture teacher has to choose from the curriculum only aspects s/he can teach depending on given material resources. This means a teacher has to do things that have not yet been done by scholars: s/he forms the content of "physical culture" subject based on his/her vision, scrupulousness, intuition and work conditions.

Another thing – if physical education has to become a core element of "physical culture" subject at school then we face another serious challenge related to methodology: how keeping school-children's physical education at the forefront can we still pay enough attention to another important aspect of our work – children's physical training, improvement of their health? It's not a rhetorical question as we know that the level of physical skills, of health advances only when physical exercise exceeds a definite (long ago experimentally proved) critical level or threshold [7, 10, 11]. This means that physical exercise should be performed at a quite high motor density and high pulse rate. But it is these two factors that we usually violate developing motor abilities and skills, especially at the very beginning of the process, when coordinated structure of motor action is just being formed [6, 14].

We can identify several methodological approaches helpful in overcoming this contradiction.

The first. If motor actions to be mastered are rather simple in terms of coordination, they should be repeated at the maximum density thus we will achieve the required heart rate. For this purpose we can use frontal method of work with all possible modifications (everyone is trained simultaneously, in turns, in groups (streams)).

The second. If motor actions to be mastered are rather complicated in terms of coordination which makes frontal method of work fail, then one should use a programmed education where each step of the program is an independent motor action simple in itself which, again, provides an opportunity to use the advantages of frontal method.

The third. When programmed education can't be used either (due to lack of relevant programs or sports facilities) and a teacher will have to use a group method of work which entails idle periods due to low capacity of work area, additional tasks to develop motor (physical) qualities should be given to each of groups. Using group method of work one can also organize several work areas in a way for intensive activity (the development of motor qualities) to alternate with tasks of low intensity (motor action training).

The fourth. In case group method of work doesn't provide for intensive activity, a separate period of time should be allocated for intense (OBLA level) work aimed to develop physical qualities using either circuit training (stations) or rather intensive games.

Among the above-mentioned methodological approaches special attention should be paid to the 2nd and the 4th ones. The second approach, in particular, brings us to a conclusion that the content of physical education curriculum at school (the whole complex of exercises to be worked out) should be introduced on corresponding scientific and research basis. We should at last make up our mind in regard to what physical exercises and why *these* exercises should be worked out and in what succession. Besides, each exercise should be accompanied by definite learning algorithm. Thus we approach the idea of algorithmization of the process of learning or, in other words, programmed learning.

What's the point of this idea? It was noticed long ago that human brain doesn't operate merely according to "stimulus-response" principle, and the leading role in the implementation of different tasks, including those related to motor activity, is played by anticipatory representation of reality when, based on careful analysis of different information, future result is foreseen and the program to accomplish it is built of strict succession of definite, well-considered steps. This implies that pedagogical influence should also be consistent and built of well-considered steps. And the stronger is correlation between central nervous and pedagogical influence programs the better chance for success we have.

First the ideas of programmed (algorithmic) learning were developed by American psychologists and teachers and programs suggested by them were related solely to theoretical material. Later attempts were made to apply those ideas with respect to motor action training.

The analysis of those attempts reveals that their authors mostly analyzed the already existing approaches to teaching of theoretical material with little regard to core principles of human motor activity operation. And most importantly with little regard to the fact that teaching of theoretical material is in close relationship with the development of *concepts* and is carried out by the intelligence, and teaching motor actions is related to the development of neuromuscular conceptions about their basic stages and is carried out by physical mind. Due to that fact the suggested patterns of algorithmization of motor action teaching process are too formal and it is hard to apply them, especially taking into account the fact that general principles, mechanisms underlying the construction of such patterns are not explained. To prove that one should just have a look at the model suggested by Arefyev V.H. in his book "Methodology of physical culture teaching at school" [2].

All the above-mentioned including the arrangement of physical education curriculum content for comprehensive secondary schools and algorithmization of motor action teaching process demand profound scientific and research work the findings of which will help „physical culture“ subject become a truly comprehensive academic subject.

The 4th methodological approach implies the need for further scientific inquiry. Here is the thing. Some intensive physical exercises to cover motor deficit can be suggested either at the beginning of the main part of the lesson, or in the middle or at the end. Today we have good grounds to say that it will not have any negative impact on implementation of physical education objectives, the choice of a place of an exercise in the main part of the lesson doesn't matter much, what does matter is its occurrence. Still, scientific and research grounding here is insufficient. Further research is essential. First of all it would be interesting to research how ability to learn movements is manifested during main part of the lesson, especially when the work is done in progress mode.

Here we may proceed from the following premise. The program of motion construction and the process of its implementations depends greatly on the accuracy of data coming from the periphery to motion control center. This data is based on spatial, temporal, and power motion estimation and is provided by corresponding sensors, or rather, by receptor devices. The more sensitive the device is the better. That's why it is important to know the dynamics of this sensitivity during a lesson. This means that we have to choose relevant methodologies, to think over the research work process and to accumulate factual evidence. Analyzing and summarizing it we will see how further research strategy and tactics should look like.

Above we mentioned that there already exist a lot of factual material regarding school students' physical training (in comparison to physical education) and their health improvement. Yet here we have one aspect that requires further consideration. The thing is about such physical quality as flexibility. It's enhancement is often regarded as something of minor importance, supplementary to the development of more important qualities like strength, speed and endurance. In this regard F.L.Dolenko considering such phenomenon as hypokinesia notices that usually

hypokinesia is defined as general lack of bodily movement ignoring another aspect of this phenomenon – dramatic decrease of movements of broad and especially maximum motion span [11].

Besides, there are some other interesting facts often neglected by both theoreticians and practitioners.

1. It's widely known that oriental reflexology identifies in human body 14 permanent meridians that form 14 permanent functional zones ensuring the harmonization of energy in human body [8]. Functions of the meridians are the following: to ensure the connection of a man with an environment (like another sense body), to control blood and life energy streams, to invigorate muscles and bones, to harmonize energy (to transmit it from viscera to integument due to which signals of inner disease reach body surface), improvement of joint mobility.

2. Indicators of accumulated energy are: body fat percentage lowers, during different activities (even intense work) muscles no longer go numb and you need less food; you sleep less; you do not feel weary during the day, you stay active; flexibility increases greatly [15].

3. All systems of practicing yoga are nothing else than different approaches to body functions control exercised by means of influence on its energy using for this purpose meditation, pranayama, asanas (various postures) that require good flexibility [13].

4. Stretching (derived from English „stretch“ – to draw out or extend, to lengthen permanently) is one of the areas of health and fitness practice. Stretching is a form of physical exercise in which muscles are stretched to make you feel better.

Comparing the above-mentioned facts we can make a conclusion that flexibility is somehow related to adjustment, harmonization of energy in human body and, probably, in other vertebrates. This means that yogis are correct arguing that man's youth is in direct ratio to joint mobility.

Thereby the following thought seems logical. We know that human body doesn't permanently operate on one and the same strictly determined level. In its operation we find definite deviations from average indices and they happen according to some pattern. In regard to this we can mention biorhythms: day and night cycle, weekly, monthly and yearly cycles. These biorhythms are the most important cycles with respect to human functional state control. It is clear that manifestations of physical qualities (strength, speed, endurance and flexibility) also follow some rhythm. It would be interesting to see which of them, during day and night or a week, deviates from its average index the most. Deviation rate will be a kind of indicator of the physical quality value for the impact on human motor activity and, through it, on a person in general. Concerning monthly biorhythms it would be useful to know in what way do physical qualities depend on lunar cycle.

So again, we have to choose relevant methodologies, to think over the research work process and to accumulate factual evidence. Analyzing and summarizing it we will see how further research strategy and tactics should look like.

To sum up we should say that the issue of individual-oriented physical education is bilateral, it implies interaction between a teacher and students. It would be a mistake to take into account students' individual traits and to neglect those of a teacher. при цьому про особистість вчителя було б неправильним. Today at our disposal we have summarized best practices of work of the best physical culture teachers. Should their experience be replicated and used by other teachers? – certainly it should, otherwise why was it summarized. But the question is *how* should it be used? Every teacher is a unique personality with individual aptitudes, temper, strengths and weaknesses and it would be unwise to blindly follow the best examples. We should borrow from their experience only things that are in compliance with „borrower's“ personality. And again we face a question: how should we do it, guided by what criteria? From practical experience we know that a professional teacher with mostly phlegmatic disposition will exercise a different style of work than a sanguine teacher. In the same way the style of work of choleric or melancholic teachers will differ from those mentioned above.

So, here we also should conduct researches to optimize the process of education taking into account personal qualities of a specific teacher.

Conclusions:

1. In the process of physical advancement of school-children one should use an integrated approach to address both physical training and health improvement issues.

2. The issue of physical education should be highlighted in academic work, in junior school in particular.

3. Enhancing his skills a physical culture teacher should first of all be oriented towards development of his innate qualities.

4. Solving educational tasks in the process of advancement of school-children's physical abilities, physical culture teacher should remember that personal example is the best method of education.

Future research prospects lie in substantiation and identification of relative approaches and methodologies aimed to advance physical abilities of the younger generation.

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