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SOME CONSIDERATIONS OF THE EDUCATIONAL VALUE OF THE PROGRAMMED CONTENT OF PHYSICAL EDUCATION IN LOWER ELEMENTARY SCHOOL GRADES IN RELATION TO THE CRITICAL PERIOD OF DEVELOPMENT OF CERTAIN ANTHROPOLOGICAL CHARACTERISTICS OF SCHOOL CHILDREN

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SUMMARY

This paper positions its attention on the issue of significance of the relation between educational value of the curricula in one hand and development characteristics of the critical periods of some anthropological features of the pupils in the lower grades on the other, which are more important for solving tasks of physical education at this age. This fact has not always been taken into consideration in complying curricula hence it was the subject of serious discussion on several professional symposiums, with the conclusion "... it can be assessed that current curricula are not in full compliance to the anthropological features of the pupils in the early school age..." Starting from the quoted conclusion, in the beginning of the new millennium a new curricula for the elementary school was implemented with precise operational goals in respect to gender and age of the pupils.

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Enrolling with the school, stabilisation of the motion skills and other aspects this anthropological features depends on, a child is capable of mastering more complex motions than congenital ones which they have mastered in the previous programs and therefore, by engaging the professionals, they have opted for this age more advanced content which considers critical development period above all motion skill, when the sensibility of structural functions is more expressed (morphological, neuro-physiological...), i.e. systems that are dealing with organisation of motion skills patterns.

The paper also considers other anthropological features such as physical processes - attentions, thinking, memory, which were taken into consideration when selecting current curricula.

The second part of the paper presents curricula and its educational value, especially from the point of methodical orientation to exercises from the general motion structure or the link the mastering exercises as a whole depends on.

Keywords: sensitive, critical periods, anthropological characteristics

INTRODUCTION

This paper focuses on the importance of the effectiveness of the educational values of programmed content of physical education for the younger elementary school age, in relation to the sensitive periods of development of certain anthropological characteristics and the critical periods, for the timely inclusion of physical exercise in order to achieve optimal results.

This fact was not always taken into consideration when designing curricula, and was thus the subject of serious analysis at various conferences, with the following conclusion: "..... it could be noted that the current programmed content is not to a great extent suited to the anthropological characteristics of children of a younger school age.....". Beginning from the aforementioned conclusion, at the start of the 2000s, a new physical education program was designed for elementary schools with precise operational goals aligned with the gender and age of the school children; then over the past few years this curriculum was realigned with the conception of reform tasks; but when it comes to the program content itself, with small exceptions for minor interventions, it has remained the same.

With the start of their education, the stabilization of their motor skills and other aspects on which anthropological characteristics depend, a child is able to acquire movements that are more complex than the naturally occurring ones which they have learned as part of previous programs; thus, through professional engagement, the new curriculum designed for this particular age group consists of more bold choices made in terms of content, which take into consideration *the critical periods of development*, primarily of the motor skills, at which time the *sensibility* of other

structural functions is pronounced as well (morphological, neurophysiological, cognitive,...), that is, of the system which oversees the organization of motor patterns. These are program contents which provide *knowledge of elementary techniques of ontogenetic motor forms*, that is, ability as the precondition for the formation of life-long habits. This last sentence indicates a smaller, but more significant methodological difference between the first program designed after the year 2000 and the following, current one, and which lies of the following: in the former, program content is represented not only in the form of the conventional point-by-point sequence, but also from the viewpoint of a methodological focus on exercise based on general structure of movement, that is, exercise of the basic leading elements or links, which when learned allow the child to learn the exercise as a whole.

It is well known that during the genesis of each individual phylogenetic and ontogenetic developmental processes must be taken into consideration. When it comes to motor skills, the former (phylogenetic), cannot be affected by exercise, and this includes, as previously stated, the various natural forms of movement; the latter (ontogenetic) is subject to the influence of organized physical exercise such as physical education classes.

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A human being represents a complex, dynamic and organized system of anthropological characteristics which function in mutual co-dependence; however, on this occasion the topic of interest are only certain characteristics of individual sub-systems – *the morphological, neurophysiological, and motor* - from the standpoint of the well-known fact that during one's lifetime certain anthropological characteristics undergo *sensitive periods* of development, which under the influence of particular external interventions (physical activity) can achieve their greatest development, and the *critical period* as a period of time when one must act in response to certain stimuli (physical exercise) in order to achieve the optimum effect in their development.

- *Morphological* characteristics, as anthropometric ones (body height and body mass, thoracic circumference, skinfolds,...) are mostly under the influence of genetic factors (the factor of growth and biological maturation). The results of several studies have indicated a negligible impact of physical exercise on the transformation of these characteristics. Therefore, in this paper the importance of these characteristics for the choice of program content for younger elementary school children stems only from the pedagogical and methodological aspects, since some of them could be impeding factors, and some mitigating factors for

acquiring the exercise material. These aspects belongs to the domain of the differential approach, as do the didactic norms used in the adaptation of the content of physical education to individual abilities of the school children. However, even though it is beyond the scope of this paper, we should be reminded that these characteristics condition the predisposition for individual types of sports and can be taken into consideration in the selection process for some of them. When it comes to morphological characteristics, we should also cite the favorable circumstance which refers to the already manifested disproportion between the development of body muscle mass and the heart muscle in favor of the latter, which is a favorable circumstance for the implementation of aerobic exercise.

- *Neurophysiological* characteristics for this age refer to the process of maturation of complex mechanisms mostly of the nervous system, which represents the basis of learning dynamic motor stereotypes, that is, the process of enabling this system to *coordinate* the process of performing movement in terms of a fast and broad reorganization of movement, precisely carried out in relation to its temporal, spatial and energy elements. This characteristic of the neurophysiological system is known in professional terminology as *coordination* and according to existing research of this age group, physical exercise has an effective impact on the improvement of the function of this system, especially when these exercises refer to mastering the techniques of ontogenetic forms of movement, which is the topic of physical education classes. At this point we must add that the performance of a movement depends on the state of various emotional systems: proprioceptive sensitivity (stretching of the muscles, tendons and joint sockets), the optimal sensitivity of the neuro-muscular apparatus (afferent and efferent neurons – the transfer of excitation impulses from the periphery towards the center and vice versa), the sensitivity of the sensory organs (the vestibular apparatus, sensitivity of the skin, hearing and sight,...).
- *Motor skills* in the broadest sense refer to the overall coordinated movements of the human body which are managed by the brain, while in the narrow sense motor characteristics refer to the current state of an individual's ability to perform various movements. In the case of children of this age, they are undergoing a process of consolidation of these anthropological characteristics, which are still manifested as complex, even though a mild dissociation is implied, especially in terms of gender. This

occurrence (complex manifestation) creates difficulties in monitoring the effects of physical education of school children of this particular age, as previously indicated; this includes the low sensitivity of the measuring instrument for the evaluation of some of them (strength, speed, endurance, agility) since there are no distinctions (no discrimination) among the participants based on their results.

- In addition to the problem of the cited age dimensions of younger elementary school children, the entirety of the anthropological space, when it comes to the educational value of the content of the physical education curriculum designed for this age group, also contains other characteristics as well. This time, attention will be focused only on some of the characteristics of the cognitive space which usually includes psychological processes in their entirety, which are in the function of *the heuristic abilities of the child* and are hierarchically organized – the senses, perceptions, memory, thinking,...
    - *The senses,* the simplest contents of awareness which are devoid of any previous experience and should be understood as the sensory and elementary basis of perception.
    - *Perceptions,* as sensory impressions, ensure the function of memory and thought. It is a fact that at the basis of the process of perception we find associative bonding of the sensory impression with the previously experienced material. In line with the topic of this paper, we need to point out the importance of *kinesthetic perception* which is the result of the cortical processing of information from the muscle receptors, joints (proprioceptive sensitivity), eyesight and skin, which plays a role in the regulation of effectiveness of motor behavior in space, and the orientation of the mutual relations of certain body parts towards the body as a whole. During motor learning a child is not able to repeat an exercise in its entirety, since observation is not permanent, and so we only obtain a fragmentary representation of the demonstrated movement; and that is why the child needs to repeat it over and over again, accompanied with the living word which is used to complete the visual impression.
    - *Memory* has three functions – *memorization or storing* as an active process of understanding exercises, that is, parts in the system of its structure, then *retention or coding* of the memorized material (images) and

retrieval as the ability to effectively use the memorized material. *Motor memory* is based on the representations (images) of a certain movement as the motor pattern fixed in the zone of the cortex responsible for the performance of this movement.

- *Thinking and learning* have a mutually functional dependency in the process of mastering the technique of ontogenetic motor forms (performed movement). For successful learning *concrete thought* at the basis of which we find perceptions (images), unlike *abstract thought,* which is based on the conceptual and symbols, is important. Children of this age insufficiently use concepts and symbols, which are presented to them as certain pedagogical influences, since they still do not have a sufficiently developed ability for abstract thought.

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In the previous short account of the existing body of knowledge on the sensitive periods of development of certain morphological, neurophysiological, motor and cognitive characteristics which under the influence of external interventions (physical activity) express their greatest developmental effect, *the younger school age is that critical period when we have to expose them to certain stimuli,* primarily as part of physical education classes, as the only organized form of physical exercise in the educational system.

From that point of view, the following section contains an evaluation of those program contents which provide support for the sensitive periods of development of individual neurophysiological characteristics, but which are also representative of the proper educational values of the program content of physical education classes for younger elementary school children.

1. Sports gymnastics

Sports gymnastics is based mainly on acyclical complex movements which consist of separate acts that are activated in a certain sequence; the program content at this age is such that it does not overexert the muscle-joint system since the children's muscles are not yet firmly attached to the bone, while at the same time, taking care of limited joint mobility.

- *A program of floor exercises* consists of various movements which improve mechanisms that are at the basis of the *coordination* of motor behavior of the entire body in the various positions it uses to move through space, with a sense of proper orientation of the

mutual relations of certain parts of the body to the whole. In addition, an important quality of floor exercises in the current program (several types of flips during an individual performance at a time, upside-down stands and various hangs) are a part of their significant influence on improving *proprioceptive sensitivity and the sensitivity of the sensory organs of the vestibular apparatus in particular.* Combining elements into short combinations, as presented in the curriculum, additionally strengthens the formation of movement on the basis of kinesthetic perception and specific thinking, as well as other heuristic abilities such as *attention,* which represents the ability to focus and continue activities in a particular direction or towards a particular goal, but which at this age can still not be fixed on a certain object for extended periods of time.

- *Bar exercises* are performed at a smaller or greater height, which require a certain decisiveness during the first attempts to calm the fear which will through repetition diminish and disappear. It is a characteristic of these exercises that the movement of the body is predominantly achieved by use of the hands and shoulder belt, with a reliance on external forces, which reduces the engagement of strength and is desirable at this age. Exercises, such as those performed on the parallel and uneven bars, low bars and rings, contain elementary movement for this type of sport, such as stands, mixed hangs, glides, walkovers, swings.... They require the proper perception of the spatial organization of the bars and certain positions of the body, as well as the transfer from one position or movement to another one in a particular order, which is regulated by coordinated management of the system for the formation of these movements and their mutual relations, which is regulated by the highest centers of the nervous system.
- *Jumps* contain in part cyclical and in part acyclical movements which follow one another in a harmonious pattern, precisely, and in a connected order, thus contributing to the improvement of the coordinated control of management of these and similar movements.
- Exercises on the *vaulting box, low and high bars* requires great attention which is focused on the performance of movements under conditions of precarious balance (unstable) on a smaller surface, when the child should, through exercise, achieve a high level of development of this ability and learn to maintain it while adhering to the esthetic norm in the form of correct and precise

manifestation during the connection of elements into a composition.

2. Rhythmic gymnastics is the most important type of sort which contributes to the formation of proper body posture, since the specific nature of the basic technique of movement tied to this sport is focused on particular body positions (the basic gymnastics body stance) which is achieved through exercises for strengthening the spinal column, stretching exercises, developing the agility and strength of the large muscle groups of the torso and especially the amplitudes in the joints of the extremities. Handling a prop, in addition to manual agility, requires the ability to harmonize one's own movement and the movement of that prop with the character, tempo, rhythm and music dynamics.

3. Swimming has its own specificity in relation to the other sports since this activity is tied to the aquatic environment in which the body moves, without the possibility of using sight to control one's own movements, body position and certain body parts. Thus, it is not possible to create a concept of this movement (the technique that is being learned) based on visual perception which for children of this age is more appropriate than the kinesthetic perception which is possible under these circumstances. Swimming for this age group has an immeasurable importance for the prevention of bad posture, as well as the correction of existing deformities, primarily of the spinal column.

4. The remaining program content does not belong to the first zone of the critical period, but is significant for the overall development of motor skills, such as running which is favorable for the improvement of aerobic capacity due to the greater development of the heart muscle and body musculature, as well as sports games, since the child does not enjoy watching the game as its relation towards movement is not of a receptive but of a productive character.

CONCLUSION

- Starting from the fact that during the human life span certain anthropological characteristics undergo *sensitive* periods of development, we could also say that they are actually "offensive" processes of maturation of complex neurophysiological mechanisms of the greatest nervous activity which coordinate the formation of movement precisely performed in relation to its temporal, spatial and energy elements; the younger school age is a temporal, or a *critical period* when it is necessary to act through physical exercise (such as "training") and thus make use of the greatest applicable value of the functioning of these mechanisms.

- As a whole, *the characteristics of the structure of the aforementioned content* of the physical education curriculum designed for younger school age children, to the greatest extent has *optimal educational values which correspond to the critical and sensory periods of development of certain anthropological characteristics at that age,* so that this positive mutuality lies at the basis of the more pronounced and greatest effects in mastering the techniques of complex ontogenetic forms of movement, which is the goal of physical education in school.
- However, for program content which is so complex, teachers as the realizers do not have sufficient levels of methodological preparation, and since work with professional physical education teachers has been abolished in the third and fourth grade, and since the current curriculum does not have a course form for the sports gymnastics and swimming programs, which could be realized with physical education teachers, the chances for achieving more significant results in physical education classes for younger school age children are very small. In addition, it seems uncertain whether the sports gymnastics program during the first two grades of elementary school will be enhanced by more complex structures, which all the experts are striving for, since at that age smaller body height and weight enable the child to, with assistance, more easily assume positions which contribute to the development of the stabilizers with the aim of a more effective performance and stabilization of the motor task.

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НЕКА РАЗМАТРАЊА ОБРАЗОВНЕ ВРЕДНОСТИ ПРОГРАМСКИХ САДРЖАЈА ФИЗИЧКОГ ВАСПИТАЊА У НИЖИМ РАЗРЕДИМА ОСНОВНЕ ШКОЛЕ С ОБЗИРОМ НА КРИТИЧНЕ ПЕРИОДЕ РАЗВОЈА НЕКИХ АНТРОПОЛОШКИХ СВОЈСТАВА УЧЕНИКА

САЖЕТАК

У овом раду пажња је усмерена на значај ефикасности образовних вредности програмских садржаја физичког васпитања за ниже разреде основне школе с обзиром на сензитивне периоде развоја неких антрополошких карактеристики и временске или критичне периоде за правовремено деловања физичком вежбом ради постизања оптималних резултата у том правцу. Ова чињеница није увек узета у обзир приликом сачињавања планова и програма, те је с тога била предмет озбиљних разматрања на више стручних скупова, са закључком "..... да се може оценити да актуелни програмски садржаји нису у великој мери примерени антрополошким карактеристикама деце у раном школском узрасту.....". Полазећи од наведеног закључка, почетком двехиљадитих година донет је нови програм физичког васпитања за основну школу са прецизираним оперативним циљевима с обзиром на пол и узраст ученика .

Поласком у школу, стабилизацијом моторике и других аспеката од којих зависи ова антрополошка карактеритика, дете је способно да савладава сложенија кретања од природних који су преовладавали у претходним програмима, те су, ангажовањем струке, за овај узраст смелије одабрани они садржаји који уважавају критичне периоде развоја, пре свега, моторике, када је израженији сензибилитет структуралних функција (морфолошких, неурофизиолошких,...) односно, система који се баве организацином моторних образаца . У раду су наведене и друге антриполошке карактеристика као што су психички процеси - пажња, мишљење, памћење- које су узете у обзир избором садржаја актуелног план и програма.

У другом делу рада представљени су програмски садржаји и њихова едукетивна вредност, посебно са становишта методичког усмерења на вежбе из опште структуре покрета, односно, вежбе основних водећих елемената или карике од чијих овладавања зависи овладавање вежбом у целини.

Кључне речи: сензитвни, критични периоди, антрополошке карактеристике

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РАССМОТРЕНИЕ ОБРАЗОВАТЕЛЬНОЙ ЦЕННОСТИ ПРОГРАММИРОВАННОГО СОДЕРЖАНИЯ ФИЗИЧЕСКОГО ВОСПИТАНИЯ В МЛАДШИХ КЛАССАХ НАЧАЛЬНОЙ ШКОЛЫ ПО ОТНОШЕНИЮ К КРИТИЧЕСКОМУ ПЕРИОДУ РАЗВИТИЯ НЕКОТОРЫХ АНТРОПОЛОГИЧЕСКИХ ХАРАКТЕРИСТИК ШКОЛЬНИКОВ

АННОТАЦИЯ

В данной статье акцентируется внимание на вопросе значимости соотношения между образовательной ценностью учебных программ, с одной стороны, и характеристиками некоторых антропологических особенностей развития школьников младших классов в критические периоды, которые являются более важными для решения задач физического воспитания школьников этого возраста. Этот факт не всегда принимали во внимание при разработке соответствующих учебных программ, поэтому он стал предметом серьезного обсуждения на нескольких профессиональных симпозиумах, где был сформулирован вывод: "...можно констатировать, что существующие учебные программы не в полной мере соответствуют антропологическим особенностям учащихся младшего школьного возраста...". Руководствуясь данным выводом, в начале нового тысячелетия был внедрен новый учебный план для начальной школы с четкими оперативными целями развития учеников с учетом пола и возраста.

Зачисление в школу, стабилизация навыков движения и другие аспекты влияют на развитие антропологической особенности, обеспечивают ребенку способность овладеть более сложными, в отличие от врожденных, движениями, которыми он овладел в результате подготовки по предыдущим программам, и поэтому при поддержке профессионалов было выбрано, принимая во внимание критический период развития, для этого возраста более совершенное содержание, прежде всего, навыков движения, когда более выражена чувствительность структурных функций (морфологических, нейро-физиологических и др.), то есть систем, которые обеспечивают организацию навыков движения.

В статье также рассматриваются другие антропологические особенности, такие как физические процессы – внимание, мышление, память, на которые были ориентированы специалисты при выборе существующих учебных программ.

Во второй части статьи представлены учебные программы и их образовательная ценность с методической точки зрения, а именно, в упражнениях, выбранных из общей структуры движения, или в ориентации на освоение упражнений в целом.

Ключевые слова: чувствительность, критические периоды, антропологические характеристики

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