

ERGONOMIC AND PEDAGOGICAL CONDITIONS FOR INTRODUCTION OF PHYSICAL AND HEALTH TECHNOLOGIES IN THE EDUCATIONAL PROCESS IN THE NEW UKRAINIAN SCHOOL

CONDIÇÕES ERGONÔMICAS E PEDAGÓGICAS PARA A INTRODUÇÃO DE TECNOLOGIAS FÍSICAS E DA SAÚDE NO PROCESSO EDUCACIONAL NA NOVA ESCOLA UCRANIANA

CONDICIONES ERGONÓMICAS Y PEDAGÓGICAS PARA LA INTRODUCCIÓN DE TECNOLOGÍAS FÍSICAS Y DE LA SALUD EN EL PROCESO EDUCATIVO EN LA NUEVA ESCUELA UCRANIANA

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ABSTRACT: The purpose of the article is to substantiate the effectiveness of ergonomic and pedagogical conditions in the process of introducing physical culture and health technologies in the educational process of the New Ukrainian School. The scientific literature for the introduction of these areas in the educational process of the New Ukrainian School is analyzed. Ergonomic and pedagogical conditions in the process of introduction of physical culture and health technologies in the educational process of the New Ukrainian school are singled out. It is concluded that this educational process involves strengthening the educational aspects of physical education, using the newest sports and improving technologies, and supporting public authorities, which must provide a variety of this process. The results of the introduction of ergonomic and pedagogical conditions identified are: increasing the efficiency of the educational process, increasing motivation for physical education, the desire to lead a healthy lifestyle, physically develop and improve.

KEYWORDS: Ergonomics. Pedagogical ergonomics. Ergonomic-pedagogical condition. Technology. Physical culture and health technology.

RESUMO: O objetivo do artigo é fundamentar a eficácia das condições ergonômicas e pedagógicas no processo de introdução da cultura física e das tecnologias de saúde no processo educacional da Nova Escola Ucraniana. A literatura científica para a introdução dessas áreas no processo educacional da Nova Escola Ucraniana é analisada. São

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destacadas as condições ergonômicas e pedagógicas no processo de introdução da cultura física e das tecnologias de saúde no processo educacional da nova escola ucraniana. Conclui-se que esse processo educativo envolve o fortalecimento dos aspectos educativos da educação física, utilizando os mais novos esportes e aprimorando as tecnologias, e apoiando o poder público, que deve proporcionar uma diversidade nesse processo. Os resultados da introdução de condições ergonômicas e pedagógicas identificadas são: aumentar a eficiência do processo educacional, aumentar a motivação para a educação física, o desejo de levar um estilo de vida saudável, desenvolver e melhorar fisicamente.

PALAVRAS-CHAVE: *Ergonomia. Ergonomia pedagógica. Condição ergonômica-pedagógica. Tecnologia. Cultura física e tecnologia em saúde.*

RESUMEN: *El propósito del artículo es fundamentar la efectividad de las condiciones ergonómicas y pedagógicas en el proceso de introducción de la cultura física y las tecnologías de la salud en el proceso educativo de la Nueva Escuela Ucraniana. Se analiza la literatura científica para la introducción de estas áreas en el proceso educativo de la Nueva Escuela Ucraniana. Se destacan las condiciones ergonómicas y pedagógicas en el proceso de introducción de la cultura física y las tecnologías de la salud en el proceso educativo de la escuela Nueva Ucraniana. Se concluye que este proceso educativo implica fortalecer los aspectos educativos de la educación física, utilizando los deportes más novedosos y mejorando las tecnologías, y apoyando a las autoridades públicas, que deben brindar una variedad de este proceso. Los resultados de la introducción de condiciones ergonómicas y pedagógicas identificados son: aumentar la eficiencia del proceso educativo, aumentar la motivación por la educación física, el deseo de llevar un estilo de vida saludable, desarrollarse y mejorar físicamente.*

PALABRAS CLAVE: *Ergonomía. Ergonomía pedagógica. Condición ergonómico-pedagógica. Tecnología. Cultura física y tecnología de la salud.*

Introduction

Today the emphasis is on the individualization of the educational process. The concept of «New Ukrainian School» describes the strategy for the development of school education for the coming decades. The directions of reform outlined in the concept are aimed at a full-fledged change in Ukrainian school education (BIBIK, 2018). The essence of the idea is that an attractive, comfortable school for students will be created, which will provide proper education, turn it into a factor of economic growth, a source of national unity, the formation of personality as a responsible citizen.

The main aspect of the above reform is devoted to creating conditions for the implementation of individual educational trajectories of students and the variety of organizational forms of classes; it more sharply outlines the change of material and technical

conditions, information and subject environment, socio-cultural space of higher education (ANDRYUSHCHENKO, 2012; KOSENKO, 2021).

One of the problems of modern school education is the significant devaluation of physical education in comparison with other types of educational activities of schoolchildren. Perhaps this kind of devaluation of physical education is due to the lack of real mechanisms for the relationship of cognitive and motor activity (KIBALNYK, 2008; DOLZHENKO, 2007). The essence of such interaction is the formation of an integrated educational, health and general educational effect of learning. However, in a modern school, these components are implemented independently of each other.

We emphasize that the physical development and health of the child should be considered in conjunction with intellectual and social activity, the formation of personality and individuality. The development of children, their recovery, the creation of conditions for a rational daily routine, the right balance of physical and mental stress is based on a personality-oriented approach to raising a child. The main value of the above approach is not the process of education, but the child himself, his physical and human culture. Hence the essence of physical education as an activity that preserves and develops the child stimulates his individual versatile improvement.

For the school education system to function in accordance with the requirements of the New Ukrainian School Concept, it is extremely important to create the necessary material conditions, appropriate educational and material base - a set of material resources and conditions on which the socio-pedagogical environment is modeled: goals, objectives of teaching, education and development of students (POLISHCHUK, 2008).

The goal of the article - to substantiate the expediency of ergonomic and pedagogical conditions in the process of introduction of physical culture and health technologies in the educational process of the New Ukrainian school.

Objectives of the study

1. To analyze the scientific literature on the need for the introduction of physical culture and health technologies in the educational process of the new Ukrainian school;
2. To single out ergonomic and pedagogical conditions in the process of introduction of physical culture and health technologies in the educational process of the New Ukrainian School.

Methods

General scientific methods were used to solve the set tasks:

- 1) Method of analysis and synthesis (in order to reveal the conceptual and categorical apparatus of research and scientific substantiation);
- 2) Scientific abstraction, induction and deduction (generalization of domestic and foreign experience in the study of this issue);
- 3) Abstract-logical (for theoretical generalization of research results and formulation of conclusions);

All methods allowed obtaining objective information about the effectiveness of ergonomic and pedagogical conditions of introduction of physical and health technologies in the educational process of the New Ukrainian School.

Analysis of the Research and Publications

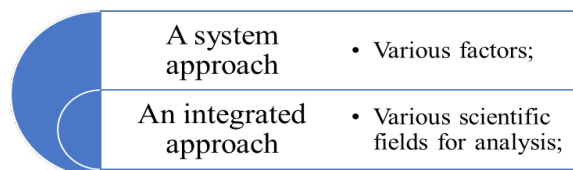
The new conditions must be fundamentally different from those that were previously in the education system, and which are now unable to provide logistical conditions for variable learning, the organization of favorable modes of work, recreation, leisure of students and teachers. This is the approach to the separation of conditions provided by ergonomics. Ergonomic approach is the implementation of ergonomic requirements for the organization of the educational process. Ergonomic approach in this case will have some features, such as: orientation on the set of basic social qualities of man, the full adaptation of the information-subject environment, learning tools to the activities of the subjects of the educational process (APOSTOLYUK, 2007).

Research in the field of ergonomics (APOSTOLYUK, 2007; ASHEROV, 2005; POPLAVSKA, 2006; SIDORCHUK, 2007; VORONINA, 2013) is of scientific interest in this regard. Significant scientific results that reveal the essence of the ergonomic approach and ergonomic conditions in the educational environment are contained in research on pedagogical ergonomics (VORONIN, 2004; PETRENKO, 2020; POCHINOK, 2020); in pedagogical psychology (ANDREEVA, 2004; etc.); in the concept of health-preserving educational technology (KOTOV, 2003; NAGAEV, 2007); in the ergodesign concept of the subject-spatial environment of organizations and institutions (KOSENKO, 2003; NECHEPORCHUK, 2018; TSYUMAN, BOYCHUK, 2018).

Even though in recent years the interest of scientists in ergonomic education of teachers (formation of ergonomic knowledge and skills in the process of their professional training, considering modern educational trends) - pedagogical ergonomics remains not only unexplored, but also relevant and promising direction of pedagogy, which provides a solution to the problem of optimizing the conditions of the teacher and student in the educational environment.

Distinctive features of ergonomic research are: systemic and integrated approaches (Figure 1).

Figure 1 – Features of ergonomic research



| | |
|------------------------|---|
| A system approach | • Various factors; |
| An integrated approach | • Various scientific fields for analysis; |

Source: developed by authors

The systems approach assumes that the subject of analysis is a variety of factors that characterize the interaction in the ergosystem. Such interactions are extremely multifaceted and dynamic and can be studied only through a comprehensive analysis of psychology, pedagogy, sociology, physiology and hygiene (KARAPUZOVA, 2012; KARAPUZOVA *et al.*, 2012).

Ergonomics as a complex science studies the capabilities and characteristics of man while working in a particular work environment to create conditions, methods and forms of work that promote productive, reliable and safe for health and at the same time comprehensive personal development.

Results and discussion

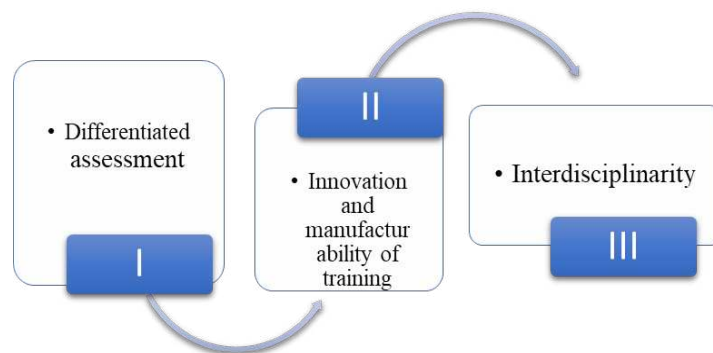
The effectiveness of the ergonomic approach in the educational process of a modern school depends on the readiness of teachers for its implementation, which is formed during the period of study in a higher education institution. The ergonomic approach provides: the direction of the content of training and educational and methodical maintenance on formation of health-preserving competence of the student; strengthening the health of students by means of didactically adapted material and technical base of the school; application of modern

health-preserving technologies and models in the educational process; monitoring the impact of the environment on the level of mastery of health competence, the state of physical, mental, social, spiritual and moral health of students, etc. (OLEKSIENKO, 2015).

At the present stage of development of physical culture and health technologies there are a set of the most various directions and the developed programs and technologies. After all, the health-improving effect of classes is to increase metabolism, prevent diseases of the cardiovascular system and musculoskeletal system, correct posture, improve physical performance, which are important prerequisites for good health (BULATOVA, 2008).

The separation of ergonomic and pedagogical conditions in the process of introducing physical culture and health technologies in the educational process of the New Ukrainian School represents anthropometric, anatomical, physiological, biomechanical characteristics and their impact on physical activity. Issues in this area include working postures, cargo work, monotonous movements, work that causes disorders of the musculoskeletal system, workplace organization, safety and human health (Figure 2).

Figure 2 – Ergonomic and pedagogical conditions in the process of introduction of physical culture and health technologies in the educational process of the New Ukrainian school



Source: developed by authors

We have identified that, one of the ergonomic and pedagogical conditions for the introduction of this process in the New Ukrainian School, is a differentiated assessment of the physical condition of students. The incidence of students enrolled in new types of educational institutions is higher than in regular schools. This confirms the view that increased workload, accompanied by the need to process a significant amount of information, significant learning and emotional strain associated with various stressors in conditions of reduced physical activity, chronic insomnia, malnutrition and irregular diet have a detrimental effect on health of primary school children.

One of the effective ways to improve the system of assessing the physical condition of primary school students is to implement it based on an integrative approach using such a feature as the somatic type of constitution (somatotype). At the same time, it should be remembered that students with different somatotypes differ significantly in the manifestation of such characteristics of physical condition as motor qualities, and have a feature in achieving a certain level of development of each in the case of comparing their achievements.

The specified ergonomic and pedagogical condition is called to be realized through a methodical component of the process of introduction of physical training and improving technologies. It is the methodological component that involves the process of assessing the health and physical fitness of students and allows not only to objectively assess the level of their development, but also serves as an effective pedagogical means of increasing motivation for physical self-improvement. The result of this ergonomic and pedagogical condition will be the elimination of physical strain, injury and other complications, which allows the teacher to objectively consider the individual characteristics of both the whole class and each student individually.

Learning activities are based on external and internal information processes. External processes are the content of the relationship between teacher and students with the source of information, including technical. Internal information processes characterize the psychophysiological side of learning - the mechanisms of perception, analysis, transformation and storage of information by the student. For pedagogical ergonomics it is important to identify the mechanism of interaction of the learner with the source of information that underlies the teaching and learning activities. The objective side of this relationship depends on the physical characteristics of information sources, and the subjective - on the properties of analyzers, through which students perceive educational information.

That is why the next ergonomic and pedagogical condition distinguishes the innovation and manufacturability of the process of introduction of physical culture and health technologies in the educational process of the New Ukrainian School. To date, it has been proven that innovations in student training help to improve innovative technologies in the system of sports training because they help to reveal the sporting potential of students. They have a positive effect on the process of physical education by changing the transfer of knowledge and training methods. The process of physical education according to the Concept of the New Ukrainian School is impossible without innovations (DYUNDIN, 2006).

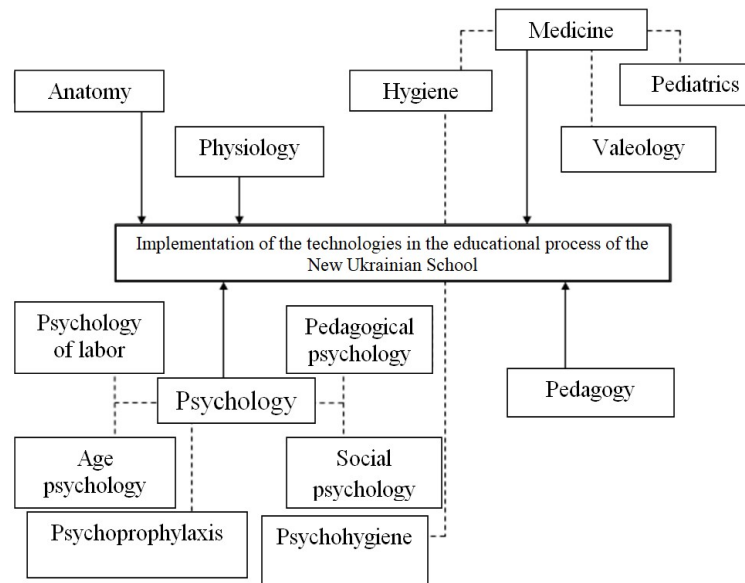
One of the interesting options for the implementation of the second ergonomic and pedagogical condition is the use of computer technology in physical education lessons (warm-up, rules of the game, dance elements etc.). Thanks to the use of computer technology, students can enjoy the exciting process of learning, not only by the power of the imagination pushing the walls of the gym, but with the help of the latest technology allows you to immerse yourself in a bright colorful sports world. This activity causes emotional uplift in students, even poorly developed students are willing to work with a computer, and therefore, it will involve each student in a physical education class.

The last, but no less important ergonomic and pedagogical condition in the process of introducing physical culture and health technologies in the educational process of the New Ukrainian School is interdisciplinarity. The selected ergonomic and pedagogical condition involves the application of integrated knowledge about the educational activities of the student in the system "teacher, student - teaching aids - environment".

The integrated approach provides an opportunity to comprehensively, and therefore more fully understand the ergonomic patterns of introduction of physical culture and health technologies in the educational process of the New Ukrainian School, which take place in the educational process. This process involves the consideration of integrated knowledge (medical, biological, psychological, pedagogical, artistic sciences) in the process of physical education.

The above-mentioned ergonomic and pedagogical condition presupposes the connection of the process of introduction of physical culture and health technologies in the educational process of the New Ukrainian School with sciences such as (Figure 3): human anatomy and physiology, medicine, psychology, pedagogy.

Figure 3 – Interdisciplinarity of the process of introduction of physical culture and health technologies in the educational process of the New Ukrainian school



Source: developed by the authors

Without knowledge of the patterns of growth and development of the student's body, age characteristics of individual organs and the body as a whole, as well as the course of physiological processes and features of their regulation in educational activities, it is impossible to ensure optimal functioning of the student's body during the introduction of physical culture New Ukrainian School.

Regarding the field of medical sciences, we represent the connection of this process with general (school) hygiene, pediatrics, valeology. The connection with school hygiene is quite important. In particular, issues of interest are related to hygienic standards and requirements for classrooms, school equipment, microclimate, as well as psycho-hygienic recommendations for workload, daily routine, physical activity of students.

A comprehensive approach to the study and design of student activities in the learning environment determine the close and multifaceted relationship with psychological and pedagogical sciences, in particular, with psychology and its branches: psychology of work, pedagogical psychology, age psychology, social psychology. Of particular interest are issues such as patterns of mental processes of the child (memory, perception, and thinking), factors of personality development, psychological patterns of learning and education, mental phenomena that occur in the process of human interaction and more.

It should be noted that a special place is occupied by establishing close links between psychoprophylaxis and psychohygiene with the process of introducing physical culture and health technologies in the educational process of the New Ukrainian School, which study mental health problems and the impact of various environmental factors, and measures to prevent mental illness of the individual.

Conclusions

In view of the above, we can say that the current younger generation has significant shortcomings in health and fitness, so now it is necessary to revise school programs in physical education and develop recommendations for improving control and training standards and requirements for physical education, culture for students through the introduction of physical culture and health technologies in the educational process of the New Ukrainian School.

The traditional organization, content and methods of introduction of physical culture and health technologies in the educational process of the New Ukrainian School do not sufficiently meet modern requirements and do not provide comprehensive training for students. The organization of the process of physical education requires improvement, aimed at improving the health of each student, the formation of their interest and motivation to exercise. The selected ergonomic and pedagogical conditions will help not only to increase the effectiveness of the introduction of physical culture and health technologies in the educational process of the New Ukrainian School, but also the process of physical education in general.

The ergonomic and pedagogical conditions substantiated in the work in the process of introduction of physical culture and health technologies in the educational process of the New Ukrainian school are called to improve the attitude of schoolchildren to physical culture and testing the level of their physical fitness; reduce the level of situational anxiety; to increase the motivation for physical education classes, considering the level of physical development of each child and the class as a whole; to increase the level of physical fitness in the process of independent physical education lessons as a result of differentiated education.

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