

# PHYSICAL EDUCATION AND SPORTS

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## Innovative technologies and tools in physical education

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### **Abstract.**

This work emphasizes that the informatization of education consists in a radical increase in effectiveness, attention is paid to the modernization of the physical education system, modern requirements for increasing the motivation of student youth to engage in physical education are revealed, the most widespread innovative means for physical exercise are presented, specific innovative means are given, which facilitate the educational process, thereby improving it and making it modern and interesting. Examples of various fitness trackers and mobile applications for training are given, and their main functions are disclosed, such as providing health status tracking, activity volume, monitoring the quality of exercise performance and the technique of performing certain elements and movements. Medical innovations are shown and aimed at preventing injuries and complications, serving to «unload» and stimulate the brain. An example of an electronic portfolio is given in detail, which is one of the effective ways of realizing the interconnection of technologies. It was noted that using modern technologies, it is possible to improve not only physical qualities, but also to develop the creative potential of teachers and students of education, the modernization of education encourages the search for new training and educational technologies, to the introduction of non-traditional forms and methods of education and upbringing. It is emphasized that a wide range of modern technologies for the organization of activities for those who are involved, which are currently used in various areas of pedagogy and, in particular, in physical education, provides an opportunity to select and recommend for practical use in the system of extracurricular activities, those of them,

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which allow students of various specialty groups to develop the necessary professional qualities. It is shown that the advantage of using these technologies in physical education is the possibility of comprehensively solving the tasks of physical education and the development of personal qualities necessary in one or another type of professional activity.

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**Keywords:**

*innovative technologies*  
*physical education*  
*educational process*  
*modernity*  
*student youth*  
*creativity*  
*fitness trackers*  
*mobile applications*  
*electronic portfolio*

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The essence of the modern educational process is not only to provide students with knowledge, abilities and skills, to develop thinking, but also to teach them the forms, methods, and means of independent acquisition of knowledge. The formation of independent replenishment of knowledge, orientation in the rapid flow of information is one of the directions for improving the quality of training of specialists (Dubasenyuk, 2014).

The purpose of informatization of education is to radically increase the effectiveness of the quality of training students with a new type of thinking who are able to solve problems of any complexity. Achieving this goal is possible under the condition of wide implementation of information technologies, namely:

- creation of conditions and use of didactic tools in the educational process;
- informational integration of various disciplines;
- acquisition of knowledge and skills of their use in the field of new information technologies (Dubasenyuk, 2014; Kosheleva, 2021).

Innovation in education is the process of creating, introducing and spreading new ideas in educational practice, tools, pedagogical and management technologies, as a result of which the indicators (levels) of achievements of the structural components of education increase, the system transitions to a qualitatively different state. The source of innovation is the purposeful search for an idea with the aim of resolving contradictions. Its development takes place through testing in the form of a pedagogical experiment or pilot implementation. The word "innovation" has a multidimensional meaning, as it consists of two forms: an idea and the process of its practical implementation.

Educational innovative technologies can be considered as a selection of operational actions, as a result of their implementation, motivation for the educational process is significantly improved. Along with personal-oriented, integration technologies and technologies of collective action, informational, remote, developing educational innovative technologies occupy a significant place (Dubasenyuk, 2014; Koshuba, Dudko, 2015; Kosheleva, 2021).

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Modern domestic scientists consider innovation in education as a process of creation, distribution and use of new means (innovations) to solve those pedagogical problems that have been solved differently until now; the result of a creative search for original, non-standard solutions to various pedagogical problems; actual, significant and systemic neoplasms that arise on the basis of various initiatives and innovations that become promising for the evolution of education and have a positive impact on its development; products of innovative educational activity, which are characterized by the processes of creation, distribution and use of a new tool (Moskalenko, Vlasyuk 2014; Dubasenyuk, 2014; Koshuba, Dudko, 2015; Kosheleva, 2021).

Today, the system of physical education is being modernized rapidly. It is strategically important to direct young people to learn the basic values of physical and sports culture, which ensure strengthening of physical and moral health, mental and physical capacity. Today, more than ever, modern approaches and methods of physical education of students are becoming relevant.

At the present time, in the system of physical education of students of higher education, the tasks of physical fitness prevail. The process of organizing an optimal movement regime, as the main component of a healthy lifestyle, needs changes. Preserving and strengthening the health of students is the basis for maintaining their mental capacity throughout their lives. Physical education contributes to the activation of readiness to use various innovative means in the organization of a healthy lifestyle (Moskalenko, Vlasyuk, etc. 2014).

Using modern technologies, it is possible to improve not only physical qualities, but also to develop the creative potential of teachers and students of education. The modernization of education encourages the search for new educational and educational technologies, the introduction of non-traditional forms and methods of education and upbringing (Kosheleva, 2021).

Many authors believe that the reason for the low effectiveness of physical education is the use in the content of programs of traditional means and methods that do not arouse interest among students. One of the ways to solve this

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problem, according to the researchers, is the introduction into practice of the educational process of physical education of modern types of motor activity (Moskalenko, Vlasyuk 2014; Kharlamov, Gerasimova, 2011; Kosheleva 2021).

In recent years, computer technologies are increasingly used in the physical education of students, which allows for the individualization and intensification of the process of physical education, increases the activity of students, their motivation to engage in physical exercises, creates conditions for independent work, promotes the development of students' self-esteem and creates a comfortable environment during physical exercises. The result is an increase in the effectiveness of the process of physical education of students. Modern forms of organizing educational and entertainment activities (master classes, quests, intellectual clubs, trainings, challenges, PR-campaigns; promotions, design, video presentations; flash mobs, marathons, battle-fests, animation events) have gained wide popularity among student youth (Kosheleva, 2021).

Among the rich arsenal of innovative technologies, the latest technical tools, such as fitness trackers, mobile applications, etc., are added to physical education classes. In addition to various fitness trackers and mobile applications for training, the use of "smart" tools is especially relevant. Examples:

- C-Ring Dumbbells («smart dumbbells») - track the number of calories that a person lost during training and determine the optimal duration of training with the help of a color indicator. Green color - training just started, yellow - active training phase, red - training should be finished;

- «smart» soccer ball (Adidas) - in the middle of the ball there is a special sensor that is connected to a computer or smartphone, and during training the ball sends all the necessary information to these gadgets. The ball can show the force of the punch, calculate the flight path, its chip has built-in exercises on various feints and techniques that can be used to learn how to play football. The ball monitors the correct execution of various elements of the game;

- «smart bottle» monitors the amount of moisture in the body of the exerciser and gives a signal if hydration is

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needed. The universal device Paroos G - 100 also has a built-in GPS receiver that shows the distance covered, the speed of movement and the calculation of lost calories;

- «smart clothes» for cardio training are presented by various brands, including «Sensoria Smart Clothing». Special socks and a sensor that track speed and pace monitor technique and foot placement to avoid injuries. The application analyzes data on daily movements and provides advice on how to run correctly (virtual coach).

If you use professional innovations in the field of physical culture and sports, you should pay attention to medical innovations aimed at preventing injuries and complications in those who practice. For example, the program of providing pre-medical assistance «Sport Safety Training Program». This program is aimed at training trainers-teachers who are responsible for the safety of students and athletes. Under this program, a special standard has been developed that allows trainers-teachers to predict the possibility of injuries in those who practice and, if necessary, to provide pre-medical assistance to avoid further complications.

Psychological innovations serve to «unload» and stimulate the brain. For example, the Human Cognition Project Lumosity allows you to better understand your body and find easy and effective ways to perform actions. Such performance of exercises develops the ability to perform exercises «automatically», which allows students not to worry before writing control standards or participating in university competitions, and student-athletes - not to «burn out».

A very interesting innovative social project from the «Nike» company, but, unfortunately, it is used outside of our country. The essence of the project is that a minibus driving through the streets creates a laser football field for playing in various parking lots and playgrounds. This bus has its own number, to which you need to send an SMS with the required place and time. At the right time, the laser field will be in the given location. Let's hope that such an innovation will soon be in our country.

Of all the variety of innovative directions in the development of modern didactics, one of the effective ways of implementing the interconnection of technologies is the

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educational portfolio. A portfolio is a dossier, a collection of information, achievements, recording successes. In our case, this is the business card of the student as a future specialist, as well as an individual, an idea of his capabilities, abilities.

The use of an educational electronic portfolio in physical education classes should be considered in the context of a non-traditional approach, namely the portfolio not only provides a cumulative base of each student's achievements, but also includes scientific information about health problems, professional and applied physical training (Dyachenko, 2019).

The implementation of this technology in practice is determined by objective circumstances. The real life conditions of students impose strict requirements on them: the need to possess a complex of knowledge, professional skills and abilities; experience of operational actions of performing any activity. In addition, entry into the modern professional mode of life is largely determined by good health and physical fitness (Dubasenyuk, 2014).

Statistics show the deterioration of the health of student youth, which makes us think about ways to solve the problem of strengthening and preserving the health of students - the future personnel potential of the state. In this sense, the educational electronic portfolio is considered as a tool of the learning process itself in the aspect of determining new approaches to the assimilation of knowledge by students in the field of health care responsibility. Responsibility, as a personal quality, determines the need for students to realize the importance of the concept of «healthy lifestyle», the development of certain motives, the possibility of a stable position in health-preserving activities, personal participation in strengthening and preserving health.

The main purpose of the electronic portfolio in physical education is to inculcate the skills of self-organization, self-control, self-evaluation, analysis of activities, development of self-awareness, assessment of one's own achievements and understanding of their dynamics. If we consider the electronic portfolio from the teacher's point of view, there may be various options for its use in physical



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education classes, namely:

- a storage folder with didactic material on the health problems of students, for individual work (articles, a dictionary of terms related to health and a healthy lifestyle, testing, etc.). Individual work of students with the above material contributes to the formation of a system of knowledge about health, health preservation, a healthy lifestyle;

- a document that reflects the intermediate and final results of health care activities (analysis of results, evaluations, experience; assessment of one's health, both physical, social and mental; method of compiling sets of exercises, etc.). Analysis of one's own changes contributes to one's own self-affirmation, the desire for self-improvement, self-confidence; taking care of your health as the most important value.

The educational electronic portfolio provides a set of activities of the student and the teacher, which is built taking the portfolio into account, which allows to form the informational-cognitive, motivational, behavioral aspects of the content of health-preserving activities of students. The teacher's task is to focus students' attention on problems, show ways to solve them, ensure students' involvement in activities. Students' tasks are to realize the need for a sustainable positive attitude to individual work on health preservation, using modern information technologies.

Here is an example of the structure of an educational electronic portfolio in physical education:

- the medical block consists of the sections «Physical fitness», «Self-monitoring diary» (indicators of one's own physical development and functional state of the body at the beginning and end of the school year, indicators of the state of health during physical exercises, etc.);

- the educational block consists of «Creative work» sections (essays on a specific topic and other creative works of the student); «Achievements» (a collection of documents confirming the results of physical education and sports); «Photo-video session» (posting of photo or video materials from physical education and sports, participation in competitions, etc.); «Bibliography» (own bibliography of editions, publications that were read by the student, with



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annotations is collected).

Purposeful work with the portfolio allows the student to create a complete informational picture about the state of his physical and mental health and understand its significance, learn the components of a healthy lifestyle, and plan his own educational strategy for health preservation. And with the support of a physical education teacher, students develop the ability to use the body's capabilities in order to preserve and strengthen health.

The idea of an educational electronic portfolio on physical education contains great opportunities for improving the modern learning process, which allow you to monitor the development of sustainable motivation, interest, and determine further steps that contribute to the formation of responsibility for gaining experience in health-preserving activities.

The specificity of the discipline «Physical education» involves a large amount of visual material. In its practice, the Department of Physical Education and Sports of the Ukrainian State University of Railway Transport uses videos, slide shows, and presentations.

In the conditions of distance learning, it has become difficult to carry out the educational process using traditional educational schemes. Therefore, there was a need to add multimedia technologies, namely presentations, animation, photo, video, etc. (Shepelenko, 2018).

Interactive diagrams and images are used in the training sessions, which demonstrate the variety of motor activity for students, the technique of performing exercises, movements, etc.

Videos with sets of exercises contribute to the study of the correct technique of performing movements, terminology and learning methods. Students can independently learn international symbols-gestures, with the help of which the teacher leads the group and conveys information about the exercises.

For example, during practical classes in aerobics and cheerleading, the use of animation (putting the foot on the step platform, lifting the knee during the exercise, basic steps in aerobics, lunges, swinging legs, basic hand movements

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in cheerleading, etc.) helps students to have imagination about exercise technique and muscle work (Shepelenko, 2018).

Thanks to the presentation, students learn to systematize physical activity. Taking photos and videos during classes helps to analyze the performance of exercises, find errors and correct them independently, constantly monitor the quality of the performance of certain exercises.

One of the effective methods of learning and improving movements is the «video leader» method. All participants of the educational process perform exercises at the same pace and in the same sequence. This technique can also be used for self-study. This facilitates the work of the teacher, who can monitor the quality of the movements and visually observe the impact of the load on the body of each participant.

The use of multimedia technologies in the educational process of sports specialization showed positive results. Students master the technique of performing special exercises characteristic of these sports, improve the level of technical and physical training. Information technologies make it possible to individualize the educational process, increase the activity of students, help to intensify the process of physical education, increase the motivation of students, create conditions for independent work, contribute to the development of self-esteem in students (Shepelenko, 2018; Dyachenko, 2019 Kosheleva, 2021).

Conclusion: A wide range of modern technologies for organizing the activities of students, which are currently used in various areas of pedagogy, and, in particular, in physical education, provides an opportunity to choose and recommend for practical use in the system of extracurricular activities those of them that allow developing the necessary professional qualities for students of various groups of specialties. The advantage of using these technologies in physical education is the possibility of a complex solution to the tasks of physical education and the development of personal properties and qualities necessary in one or another type of professional activity (Kosheleva, 2021).

So, it can be concluded that an organized innovative system of physical education using non-traditional forms and methods of physical education and various technologies

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ensures the effective formation of positive motivation for a healthy lifestyle in those who study.

Thus, the use of innovative means in the physical education of students will stimulate the processes of their self-development, expand erudition in the field of physical culture and sports.

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