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DOI: https://doi.org/10.46502/issn.1856-7576/2025.19.03.23

Cómo citar:
Leleka, V., Vasilevskiy, V., Kravchenko, I., Davydova, N., & Redko, S. (2025). Digital technologies in the professional training of future specialists in physical culture and sports for health activities. *Revista Eduweb*, *19*(3), 359-376. https://doi.org/10.46502/issn.1856-7576/2025.19.03.23

Digital technologies in the professional training of future specialists in physical culture and sports for health activities

Tecnologías digitales en la formación profesional de futuros especialistas en cultura física y deporte para la salud

Vitalii Leleka
Doctor of Pedagogical Sciences, Associate Professor of the Department of Physical Culture and Sports, Admiral Makarov National University of Shipbuilding, Ukraine.
https://orcid.org/0000-0001-5680-7784
leleka9984@ukr.net
ResearcherID: IWU-4464-2023

Vadim Vasilevskiy
PhD in Biology, Post Doctoral Student of General and Differential Psychology Department, State Higher Educational Institution «Donbass State Pedagogical University», Ukraine.
https://orcid.org/0009-0002-4938-5944
vadik.vasilevskiy@gmail.com
ResearcherID: NRY-0068-2025

Ihor Kravchenko
Senior Lecturer of the Department of the Theory and Methods of Sport, Sumy State Pedagogical University named after A. S. Makarenko, Ukraine.
https://orcid.org/0000-0003-3125-2131
cravchenko-i@ukr.net
ResearcherID: JXX-3757-2024

Natalia Davydova
Candidate of Pedagogical Sciences, Associate Professor, Associate Professor of the Department of Sports, T. H. Shevchenko National University “Chernihiv Colehium”, Ukraine.
https://orcid.org/0000-0002-4537-2428
nata33davybova@gmail.com
ResearcherID: IYJ-0205-2023

Serhii Redko
Senior Lecturer of the Department of Theory and Methods of Physical Education, Hlukhiv National Pedagogical University of Oleksandr Dovzhenko, Ukraine.
https://orcid.org/0000-0002-7227-6458
redko@gnpu.edu.ua
ResearcherID: MSY-1729-2025

Recibido: 17/07/25
Aceptado: 26/09/25

Abstract

The article emphasizes the importance of health work in the field of physical culture and sports, highlighting ways to enhance key training areas in higher education through digital technologies. These methods aim to improve the quality of physical culture professionals and promote a healthy environment during society's modern development. The role of educational, training, methodological, and practical classes in establishing a healthy environment is clarified. The components of physical culture and health preservation

are described to support the application of digital technologies, along with measures and tools related to the health function of physical culture – specifically, physical culture and health technologies – as well as the tasks and rules of modern health work. An experiment testing the effectiveness of the developed system for training future physical culture and sports specialists indicated that the control group's results remained largely unchanged. In contrast, the experimental group showed significant qualitative improvements after implementing the system and conducting the author's special course. These changes are reflected in the overall readiness structure and in various factors, marked by shifts in the significance of individual components of readiness.

Keywords: professional training, future specialists in physical culture and sports, digital technologies, health activities, physical culture and health technologies.

Resumen

El artículo enfatiza la importancia del trabajo sanitario en el ámbito de la cultura física y el deporte, destacando maneras de mejorar áreas clave de formación en la educación superior mediante tecnologías digitales. Estos métodos buscan mejorar la calidad de los profesionales de la cultura física y promover un entorno saludable en el desarrollo moderno de la sociedad. Se aclara el papel de las clases educativas, formativas, metodológicas y prácticas en el establecimiento de un entorno saludable. Se describen los componentes de la cultura física y la preservación de la salud para apoyar la aplicación de las tecnologías digitales, junto con medidas y herramientas relacionadas con la función sanitaria de la cultura física – en concreto, la cultura física y las tecnologías de la salud, así como las tareas y normas del trabajo sanitario moderno. Un experimento que evaluó la eficacia del sistema desarrollado para la formación de futuros especialistas en cultura física y deporte indicó que los resultados del grupo de control se mantuvieron prácticamente sin cambios. Por el contrario, el grupo experimental mostró mejoras cualitativas significativas tras la implementación del sistema y la realización del curso especial del autor. Estos cambios se reflejan en la estructura general de la preparación y en diversos factores, marcados por cambios en la importancia de cada componente de la preparación.

Palabras clave: formación profesional, futuros especialistas en cultura física y deporte, tecnologías digitales, actividades de salud, cultura física y tecnologías de la salud.

Introduction

Under the conditions of informatization of professional training of future specialists in physical culture and sports for recreational activities, which involves the use of digital technologies, high-tech equipment in professional activities is impossible without the implementation of the information and technological function. Providing and creating favorable conditions for human development, modern education is designed to prepare a competitive specialist for the labor market who is focused on self-improvement, continuous professional development, self-realization, and career growth. This provision applies to the professional training of future specialists in physical culture and sports (Ordonhes et al., 2021). The use of digital technologies is in demand during professional activity because society places new demands on human education and health, and therefore requires future specialists in physical culture and sports to effectively implement health activities into the content of each person's life based on existing knowledge.

Currently, society needs such specialists in physical education and sports who will be able to perform health activities, prevent diseases, promote a healthy lifestyle, and increase the level of physical activity of the population using digital technologies (Recio Moreno et al., 2023).

The topic of the selected study is also relevant because today there is a decrease in interest in physical culture, health, and sports, and mass activities among young people, and an increase in interest in the use of digital technologies. Therefore, there is a need to improve the healthy lifestyle of schoolchildren and

students, to increase the level of physical activity of the entire population of the planet on the basis of sports and physical culture.

The relevance of the study is also emphasized by the fact that a healthy lifestyle is 5 times more effective than the activities of the health sector, and the prevention of non-communicable diseases is 2.7 times less expensive than treatment, and therefore, the state should promote the introduction of healthy lifestyle technologies into the educational process at all levels through the use of digital technologies. Therefore, today's conditions require modern qualifications from future specialists in physical education and sports, modern and progressive views, innovative skills, abilities, and knowledge of the application of innovative methods and digital technologies.

Literature Review

We observe a significant number of studies on the problems of professional training of future specialists in physical education and sports for health activities by analyzing the scientific and methodological literature in the field of physical education and sports.

Zacca et al. (2024) analyzed and identified the main ways of training future specialists in physical education and sports for health activities, showing ways to improve physical fitness, general health, and sports results. Scientists showed the role of digital technologies (artificial intelligence, blockchain) for the development of sports therapy and rehabilitation, for rethinking approaches to sports training, physical exercises, and health.

When teaching physical education and sports, Perea Rodríguez & Abello Ávila (2022) paid attention to the use of digital tools. In collaboration with four professional programs, a study by physical education and sports scholars was conducted to identify significant differences between students' and teachers' perceptions of innovation and digital skills development. The study focused on distance learning programs.

As an alternative for the formation of professional competence in students under the influence of the digital system and the strengthening of teachers' pedagogical practice, the study of Espinoza Burgos et al. (2020) is devoted to. It is proven that teachers, considering digital technologies as an option for operationalizing knowledge and having competencies in the digital sphere, do not clearly understand the practical side of implementing digital practice, preferring the functional component to create new ways of learning knowledge from physical education, sports, and recreation in connection with complementary or common knowledge. The study draws attention to the peculiarities of physical training, which includes therapeutic activities applied to people with permanent disabilities and disabilities, to subjects who seek to maintain specific physical abilities and general.

The aim of the study by Conde Pascual et al. (2017) is to determine the level of basic digital skills of students of the University Corporation of the Caribbean (CECAR) and the knowledge of future specialists in the Faculty of Sports Science and Physical Education. The study is not experimental; 89 students made up the final sample. The results of the study showed a high percentage of respondents from the student audience who use the Internet to carry out academic activities (63%), search for information to complete university assignments (78%), etc.

Santos et al. (2023) identified the contradictions of modern society, showed the contribution of digital culture, and their prospects in the training of physical education teachers. Scientists in the thematic study used questionnaires through interviews and online forms. Teachers of the physical education course at the Federal University of Sergipe were the subjects of the study. The results of the study proved that teachers have heterogeneous perspectives on teaching in the context of digital culture. The study allowed for the development of methodological recommendations for the development of various topics related to sport and its relationship with the media.

The sports industry is facing the challenge of digital transformation. However, the extent of technological transformation and digitalization of this industry is unknown. Therefore, the aim of the study by Magaz-González et al. (2024) was to assess the use and perception of digital competences, digital technologies in European sports organizations, and to consider their technological structure. The researchers surveyed different European countries and sports modalities (Austria, Cyprus, Ireland and the United Kingdom, Italy, Portugal, Spain). The results of the study showed that they practically do not use digitalization technology, do not have enough technologies for data analysis, and for assessing technical, tactical, and physical performance. This analysis emphasizes the need to plan investment strategies in digitalization, implement a digital organizational culture, and teach digital skills.

The restrictions imposed on the health sector by the emergency situation caused by COVID-19 forced the replacement of face-to-face pedagogical practices using information technologies with distance education. Quilindo (2023) revealed the problem of adapting the new content of physical education teachers who encountered a new reality in their teaching and practical work, where digital media became the main one; they showed the difficulties that exist (Internet connection, availability of electronic equipment, etc.). A study was conducted on the distance learning format at the University of Cauca, Colombia, with high school students.

Ways and factors that allow the use of digital resources for the development of practices and competencies related to the study and teaching of physical education are considered by Freitas et al. (2023). Scientists have proven that modern technological trends in teachers' practice and factors contribute to the integration of technologies into their physical education programs, which include personal feelings, competence, and knowledge about their use. As can be seen, many modern scientists pay great attention to the introduction of elements of health-improving activities in the training of physical education and sports specialists. However, some aspects of the use of health-saving means in the process of training future physical education and sports specialists for health-improving activities through the use of digital technologies and information and communication technologies have not been fully explored by scientists.

Research objective. Improving the professional training of future physical culture and sports specialists for health activities through the use of digital technologies.

Methodology

To achieve the set goal, the following research methods were used: theoretical – studying the experience of teaching, synthesis, analysis, comparison in the field of physical culture and sports – to clarify the state of the existing problem of professional training for health activities of future physical culture and sports specialists through the use of digital technologies; generalization and systematization – to substantiate the structural components of readiness for health activities of physical culture and sports specialists; classification and abstraction – to determine the criteria, indicators, levels of readiness for health activities of future physical culture and sports specialists; generalization and modeling – to develop pedagogical conditions for high-quality professional training for health activities of future physical culture and sports specialists through the use of digital technologies; empirical: pedagogical experiment, observation, questionnaire, – to carry out an experimental verification of the effectiveness of the developed pedagogical conditions for professional training for health-improving activities of future specialists in physical education and sports through the use of digital technologies; statistical: methods of descriptive statistics, the method of factor analysis to determine the difference in the results obtained (statistically significant), qualitative and quantitative assessment of the results of the pedagogical experiment.

The general hypothesis of the study is based on the statement that in higher education institutions, the training of future specialists in physical education and sports will be successful and high-quality if the developed system of their professional training for health-improving activities through the use of digital technologies is introduced into the educational process.

Our own experience of teaching and theoretical analysis of the literature allowed us to determine the criteria for the formation of the readiness of future specialists in physical education and sports for health-improving activities. The criteria include motivational, cognitive, activity, and personal. The indicators of each criterion are substantiated.

We characterized the selected levels (high, medium, low) of readiness of future specialists in physical culture and sports for health-improving activities.

The experiment to test the effectiveness of the system of training future specialists for health-improving activities in physical culture and sports through the use of digital technologies included ascertaining, forming, and generalizing stages.

Students who were part of the control (n = 80) and experimental (n = 82) groups participated in the experiment.

Students in the control group studied at higher education institutions using traditional methods during their professional training, and in the experimental group, pedagogical conditions and a special course “Innovative system of professional training of future specialists in physical culture and sports for health-improving activities through the use of digital technologies” were developed and introduced.

The absence of a statistically significant difference between the mean values of the data was demonstrated by a comparative analysis. The mean values of the data characterize the formation of the need for approval among respondents in the experimental and control groups for the pedagogical experiment. Therefore, we argue that the experimental and control groups were homogeneous in their composition.

As a result of the conducted formative stage of the pedagogical experiment, we believe that in the experimental groups, we note a significant increase in the level of formation of the readiness of future specialists for health-improving activities through the use of digital technologies. In the control group, respondents who were engaged in the standard method, the increase in the level of formation of the readiness of future specialists for health activities is not significant.

In particular, we note that the increase in the experimental group is 12%, with a high level of formation of the readiness of future specialists for health activities compared to an increase in the control group of only 5% in the number of students with a high level.

There was also an increase in the experimental group of 14% with an average level of formation of the number of students for health activities through the use of digital technologies, compared to an increase in the control group of 7% in the number of students with an average level.

There is a positive trend in the experimental group in the number of students with a low level of readiness of future specialists for health activities through the use of digital technologies, which decreased by 26% in the experimental group compared to a 13% decrease in the number of students with a low level of such readiness.

For the effectiveness of the system of professional training of future specialists in physical culture and sports for health activities, an analysis was conducted based on the results of factor analysis of the experimental data. At the end of the pedagogical experiment, an analysis of the factor structure of the components of readiness for health activities through the use of digital technologies of students in the experimental group proves that the implementation of the developed special course and system contributed to qualitative changes, which are reflected in each selected factor by a change in the significance of the structural individual components of readiness and in the overall structure of the respondents' readiness.

The structure of readiness of future specialists for health-improving activities of the control and experimental groups in the pedagogical experiment does not differ practically: in the contribution of the factor to the total variance and in the structure of individual factors.

This indicates the homogeneity of the contingencies of the experimental and control groups before the experiment and allows us to confirm the previously applied statistical methods.

Factor analysis of the structural components of the readiness of future specialists for health-improving activities at the end of the pedagogical experiment showed that the results of the control group practically did not change, and in the students of the experimental group at the end of the pedagogical experiment, under the influence of the implementation of the developed system and the conduct of the author's special course, significant qualitative changes occurred, which are reflected in the general structure of readiness and in each selected factor by a change in the significance of individual structural components of readiness.

The implementation of the pedagogical experiment was carried out in three stages: preparatory, main, and final.

At the preparatory stage, the purpose and objectives of the study were determined, the experimental plan was developed, methods of measurement and processing of the results were identified, control and experimental groups were selected, and their homogeneity was checked.

At the main stage, the experiment was conducted.

At the final stage, the results of the experiment were analyzed, their reliability was confirmed, and conclusions were drawn about the pedagogical effect of the experiment.

The reliability and validity of the obtained results, the objectivity of their assessment, were ensured by the methodological justification of the initial positions and the qualimetric mechanism for assessing the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of the experimental and control data collection, statistical processing was carried out using MS Excel and SPSS (Statistical Package for Social Science) programs.

The total sample size in the article is 162 subjects (the control group (n = 80 people) and the experimental group (n = 82 people). When creating the sample, the criteria of content, representativeness, and equivalence were taken into account. The sample of respondents was formed by random selection using the technical procedure for calculating the selection step.

During the experiment, the target, content, and procedural components of specialists were implemented, and the effectiveness of the ways we identified in using Digital Technologies in the professional training of future specialists was tested. The results of the experimental study confirmed the applicability, optimality, and effectiveness of the proposed ways of using Digital Technologies in the professional training of future specialists in physical education and sports.

In our article, we used quantitative methods of data analysis. This group of empirical research methods includes methods of obtaining information about the object under study that allow us to identify its quantitative characteristics.

The experiment was conducted in Admiral Makarov National University of Shipbuilding, State Higher Educational Institution «Donbass State Pedagogical University», Sumy State Pedagogical University named after A. S. Makarenko, T. H. Shevchenko National University “Chernihiv Colehium”, Hlukhiv National Pedagogical University of Oleksandr Dovzhenko. The conduct of the experiment is permitted by

the scientific councils of the universities in order not to violate ethical considerations in institutions of higher education.

Results and Discussion

The importance of health-improving work of specialists in the field of physical culture and sports, and ways to improve the main areas of activity of higher education, in particular, ways to apply digital technologies.

Today, society needs a teacher who is confident in his or her competencies and himself or herself, who can perform his or her work at a high level in pedagogical reality with a sense of modernity (Castro et al., 2024).

In our study, we took into account that physical education and health work has a complex nature, and its effectiveness is determined by the mastery of the practical, educational, value-based component, therefore modern research concerns the formation of each of these components (Zhang et al., 2025) and in general the problems of physical recreation (Rodafinos et al., 2024) through the use of digital technologies.

The Persian scientist-encyclopedist Avicenna, in ancient times, noted: “The main treasure of life is not the lands that you have conquered, not the wealth that you have in chests. The main treasure of life is health, and to preserve it, you need to know a lot”. Therefore, future specialists in physical culture and sports should have deep knowledge about a healthy lifestyle, physical training of a person, proper nutrition, and mastering practical skills in work (Varga & Révész, 2023).

Thus, new challenges for professional education are posed by the training of specialists for the field of physical culture and sports to strengthen and enhance the health of the planet’s population. It is important to provide today's students with modern knowledge and motivate them to master and practically apply health-saving technologies through the use of digital technologies (Wu et al., 2025).

We emphasize the need to improve the main areas of training in higher education to improve the quality of physical education personnel for the organization of a health-improving environment at the stage of modern society development:

1. Preliminary preparation of applicants, their qualitative selection for admission to higher education institutions, because it is successful students of physical education specialties who should have such personal characteristics as: emotional stability, a balanced nervous system, orientation towards the approval of others, activity, conscientiousness, practicality, social courage, mastery of digital technologies.
2. Improving the quality of the educational process, its practical orientation, linking the learning process in higher education institutions to the real conditions of pedagogical activity in schools is an important direction in the organization of the physical culture and health environment, improving the quality of training of future physical culture teachers, maximum pedagogy of the educational process, which requires the use of games and business situations by higher education applicants that simulate the organization of physical culture and health activities, the use of digital technologies, the use of pedagogical functions by students to model physical culture and health activities (Zhang et al., 2024).

Deliberately creating indiscipline, noise situations, and violating the rules of the game is effective during relay races and outdoor games so that students can demonstrate the ability to adequately get out of the current conditions, independently find pedagogical approaches to organizing classes, be able to interest students, show restraint, calmness, demandingness, and confidence in their own knowledge and abilities. The relationship between theory and practice is the main requirement for the professional orientation of such classes; the implementation of the relationship in close unity with increasing physical fitness, cultivating physical qualities, and strengthening the health of students will make it possible to obtain a modern specialist.

The role of educational, training, methodological, and practical classes for organizing a physical culture and health environment through the use of digital technologies.

In the preparation of future physical education teachers, significant potential for organizing a physical education and health-improving environment is provided by educational and training, methodological, and practical classes. Educational and training classes with an emphasis on the development of aerobic endurance are aimed at the general physical training of the student and are able to improve the activity of the respiratory and cardiovascular systems, to ensure an increase in general physical performance. Methodological and practical classes provide methods that will enable physical education teachers, in particular in their future professional activities, to rationally use physical education facilities to preserve and strengthen the health of students, and to optimize performance (Cojocaru et al., 2022). Effective forms of methodological and practical training are the use of thematic tasks for independent implementation, problem situations, psychotechnical, simulation, and role-playing games, in the process of which the degree of readiness of future physical education teachers to practically master a certain methodology through the use of digital technologies is revealed.

Components of physical education and components of the health-preserving direction for the purpose of using measures and means of the health-improving function of physical education, namely, physical education and health-improving technologies through the use of digital technologies.

The health-improving function of physical culture and its strengthening in educational institutions aims to create an educational and developmental environment for students, which requires modernization in higher education institutions through the process of modern high-quality training of future physical culture teachers through the use of digital technologies. The personality of a physical culture specialist in a general education school must be able to fulfill the role of coordinator and manager of physical education, where one of the important components is motor activity, which is significant for ensuring the preservation and strengthening of the health of the population. In the process of physical education from the very beginning of a student's education, a physical culture specialist must include rational forms of physical exercises, which is possible through the effective use of digital technologies. During the course of education, the foundation of not only skills and abilities, but also health is laid in students, and the student's personality is gradually formed, and changes occur in the psychophysiological and physical development of each individual.

The education system is constantly in a state of renewal through the use of digital technology, and this is the main feature of the actions of each teacher and innovative thinking, which is responsible for directing the results of education to achieve the maximum possible health-improving effect based on the implementation of new means, technologies, approaches and is one of the main directions of the modern concept of physical education (Fei & Meng, 2025).

The use of means and measures of the health-improving function of physical culture, namely physical culture and health-improving technologies, is one of the components of this direction. The use of physical culture and health-improving technologies is oriented towards physical culture and health-improving activities. High-quality professional training for physical culture and health-improving activities of a future physical culture specialist is a relevant social problem. The use of targeted physical education and health-improving techniques contributes to the improvement of students' health and the rational development of physical qualities. The rationality of physical exercises, the effectiveness of physical activity, and training methods are determined by the intensity, volume, duration, rest, and work regime.

Physical education and health-improving activities are a way of implementing activities aimed at reducing the risk of developing diseases, supporting and achieving the physical well-being of each person. This is facilitated by carrying out specific measures, methods of organizing the necessary measures for performing physical education and health-improving activities, which are aimed at improving physical health and

human condition; the formation of a healthy individual, where motor activity is consciously aimed at forming a healthy lifestyle and improving health (Huchez et al., 2025).

Tasks and rules of modern physical culture and health work. Let us consider the tasks of physical culture and health work with students at the current stage:

– Formation of healthy lifestyle skills in children and students.
– Reflection in the normative development of the school's motor regime of the enhancement of the health-improving function of physical culture.
– Increasing the motor activity of students.
– Providing a differentiated approach to different groups of children.
– Introduction of effective methods, means, technologies, forms, physical culture, health activities, and sports, taking into account digital technologies, traditions, local characteristics, recreation, and working conditions.
– Formation of needs among the population for a healthy lifestyle.
– Education of a responsible attitude to the health of the environment and one's own health as a higher social and individual value.
– Optimization of the educational process through the use of digital technologies (Espinoza Burgos et al., 2020).

The tasks of modern physical education and health work are aimed at the result of professional training of a student in a higher education institution, who will be able to provide the role of a coordinator of health-preserving education in a secondary education institution, contribute to the high-quality formation of students' personal physical culture and ensure the formation of communicative skills, motivation, abilities, knowledge, personal qualities through the use of digital technologies (Quilindo, 2023).

In educational activities, it is necessary to adhere to certain rules so that physical culture has a positive effect on human health:

1. Methods and means of physical education must have a scientific justification of health-improving value and be used in the innovative content of education through the use of digital technology.
2. Physical activity should be planned in accordance with the capabilities of each individual.
3. Unity and regularity of pedagogical and medical control and self-control must be ensured in the process of using all forms of physical culture.

The health-improving, training, and therapeutic effects on the body of physical exercises become effective if they are combined with hardening in the form of air and sun baths, water procedures, and massage. Regular use of hardening factors and physical exercises improves the general condition of the immune system, the body's vitality, performance, functions of vegetative systems, and prevents premature aging.

The choice of an innovative method with a health-improving focus for physical exercises is a correlation with the possibilities, real circumstances, requirements, and is a matter of individual interest and taste of each person (Freitas et al., 2023).

Following certain rules so that physical culture has a positive impact on human health requires physical education of the individual to be organized by physical culture and sports specialists, so that it performs a developmental and preventive function. Therefore, it is necessary with the help of physical education: increasing the human body's ability to withstand negative influences, improving the functional capabilities of the body, compensating for the lack (arising in the conditions of modern life) of motor activity.

High physical working capacity of a person is associated with lower morbidity and higher motor activity. The level of physical working capacity is one of the objective criteria of human health. An indicator of good health is a high working capacity of a person, and vice versa, low values are considered a risk factor for health. Necessary for a positive approach to health are: introductory gymnastics, industrial gymnastics

during the working day, physical education breaks, physical exercises during non-working hours – tourism (bicycle, water, walking), skiing and hiking, mass games: tennis, volleyball, badminton, etc.

The formation of a high culture of a healthy lifestyle of each individual in society depends on the level of application of digital technology, the upbringing and education of the teachers themselves. The teacher must educate students who would feel the need for such a lifestyle that would initiate correct thinking in them, awaken concern about the state of society, and form worthy health-preserving behavior in a person's everyday life. The main goal of such education is the formation of skills and knowledge about strengthening and preserving health (Zacca et al., 2024).

Physical education and health care are forms of activity to achieve positive results in the life of every person, aimed at transforming the subject of the health of others and their own health, and realizing the needs of the subject in a healthy lifestyle and movement. Therefore, the formation of positive motivation for a healthy lifestyle is one of the main aspects of physical education, because health itself is a state of complete spiritual, physical, and social well-being of a person, and not just the absence of illness. And strengthening and studying health against the background of general problems is the main recreational principle that should be taken into account during the professional training of future specialists in physical culture and sports for health activities in higher education institutions, taking into account the importance of digital technologies.

Organization of a pedagogical experiment.

The general hypothesis of the study is based on the statement that in higher education institutions, the training of future specialists in physical education and sports will be successful and high-quality if the developed system of their professional training for health-improving activities is introduced into the educational process through the use of digital technologies.

Our own experience of teaching and theoretical analysis of the literature allowed us to determine the criteria for the formation of the readiness of future specialists in physical education and sports for health-improving activities. The criteria include motivational, cognitive, activity, and personal. The indicators of each criterion are substantiated.

Indicators of the motivational criterion of the formation of readiness of future specialists in physical culture and sports for health-improving activities: understanding the meaning of the profession in the field of health care, the orientation of higher education applicants to health-improving activities, the significance of health-improving activities, students' motivation to use modern means of health-improving activities, the desire to use health-improving technologies, the expression of needs and interests in self-improvement in health-improving activities through the use of digital technologies.

Indicators of the cognitive criterion of the formation of readiness for health-improving activities of specialists in physical culture and sports are completeness, scientificity, depth of knowledge regarding the features of using means and methods of conducting health-improving activities, possession of a scientific thesaurus in the field of physical health-improving, mastering new knowledge regarding health-improving activities, taking into account the possibilities of using digital technologies.

The indicators of the activity criterion of the readiness of future specialists in physical culture and sports for health activities include: professionally oriented skills and abilities in carrying out health activities, planning design, orientation in the use of health activities, the use of acquired knowledge in solving the tasks set, mastery of modern health activities technologies, the student's ability to create his own style at work, the ability to organize health activities taking into account the capabilities of digital technologies.

The indicators of the personal criterion are personal qualities: willpower, need for approval, need, and empathy in searching for impressions necessary for carrying out modern health activities, using digital technologies.

We have characterized the selected levels (high, medium, low) of the readiness of future specialists in physical culture and sports for health activities.

The experiment to test the effectiveness of the system for training future specialists in physical culture and sports for health-improving activities through the use of digital technologies included the ascertaining, forming, and generalizing stages.

At the ascertaining stage of the experiment, the following types of activities were carried out:

- Analysis of the literature on physical culture and health preservation regarding the training of future specialists in physical culture and sports for health-improving activities, taking into account the importance of the use of digital technologies.
- Determination of indicators, criteria, and levels of readiness of future specialists in physical culture and sports for health-improving activities.
- Analysis of the current state of professional training of future specialists in physical culture and sports in higher education institutions for health-improving activities, taking into account the importance of the use of digital technologies.
- Development and theoretical substantiation of a system of professional training of future specialists in physical culture and sports for health-improving activities through the use of digital technologies.

The results of the ascertaining stage of the pedagogical experiment confirmed the feasibility and relevance of developing a system of professional training of future specialists in physical culture and sports for health-improving activities through the use of digital technologies.

The formative stage of the experiment involved testing the effectiveness of the system of professional training of future specialists in physical culture and sports for health-improving activities through the use of digital technologies.

Students who were part of the control (n = 80 people) and experimental (n = 82 people) groups participated in the experiment.

Students in the control group studied in higher education institutions using traditional methods during their professional training.

In the experimental group, during the professional training of students, a developed system of professional training of future specialists in physical culture and sports for health-improving activities was introduced through the use of digital technologies.

The results of the experimental verification of the effectiveness of the system of professional training of future specialists in physical culture and sports for health-improving activities were analyzed at the generalization stage of the experiment; the prospects for further scientific developments and conclusions were formulated.

Analysis of the results of the experimental verification of the effectiveness of the system of professional training of future specialists in physical culture and sports for health-improving activities through the use of digital technologies.

The absence of a statistically significant difference between the mean values of the data was demonstrated by the comparative analysis. The mean values of the data characterize the formation of the need for

approval of the respondents of the experimental and control groups for the pedagogical experiment. Therefore, we argue that the experimental and control groups were homogeneous in their composition.

Let us analyze the dynamics of the levels of formation of the readiness of students of the experimental and control groups for health-improving activities.

Students who were in the control group studied according to the traditional methodology in higher education institutions.

The professional training of the respondents of the experimental group introduced a developed system of professional training of future specialists in physical culture and sports for health-improving activities through the use of digital technologies and a special course.

The basis of the system was developed on pedagogical conditions:

- Content filling of professional disciplines with health-preserving methods and technologies, taking into account the peculiarities of health-improving activities.
- Application in professional training of future specialists in physical culture and sports of modern digital technologies, active teaching methods, subject-subject interaction of students and teachers.
- Integration of scientific research training, theoretical training, and practical training of future specialists in physical culture and sports in the organization of scientific research work and the process of conducting student practices, including the use of digital technologies.

In the experimental group, the developed to date accessible, simple, and effective complexes of physical exercises of a health-improving orientation were tested. These are:

- Health-improving aerobics, its varieties: step, jazz, hydra-aerobics, dance aerobics, cycling aerobics, aerobics with load, aquajogging, fitness, shaping.
- 1000 movements mode (Amosov system).
- Running controlled loads (Cooper system).
- 10,000 steps daily (Michael Inai system).
- The alphabet of health running (Milner system).
- Running for life (Lydyard system).

The students of the experimental group were offered a special course, “Innovative system of professional training of future specialists in physical culture and sports for health activities through the use of digital technologies”. The control group was studied according to the usual methodology.

After conducting the formative stage of the experiment, it was established:

A high level of readiness for health activities was demonstrated by (Figure 1):

- By motivational criterion – CG – 11%, EG – 20%.
- By cognitive criterion – CG – 12% EG – 18%.
- By activity criterion – CG – 13%, EG – 19%.
- By personal criterion – CG – 13%, EG – 19%.

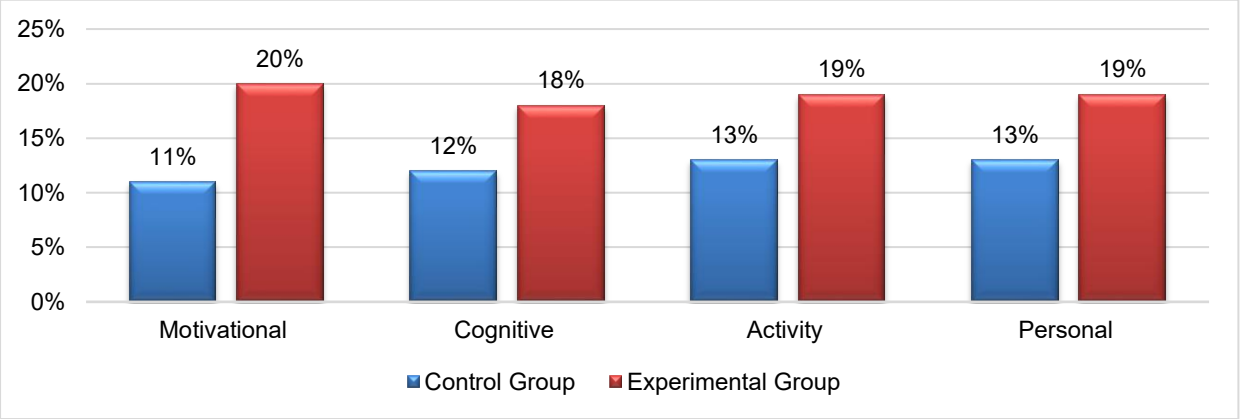

Figure 1. High level of readiness for health activities.

The average level of readiness for health activities was demonstrated by (Figure 2):

- By motivational criterion – CG – 51%, EG – 59%.
- By cognitive criterion – CG – 32%, EG – 63%.
- By activity criterion – CG – 35%, EG – 61%.
- By personal criterion – CG – 36%, EG – 63%.

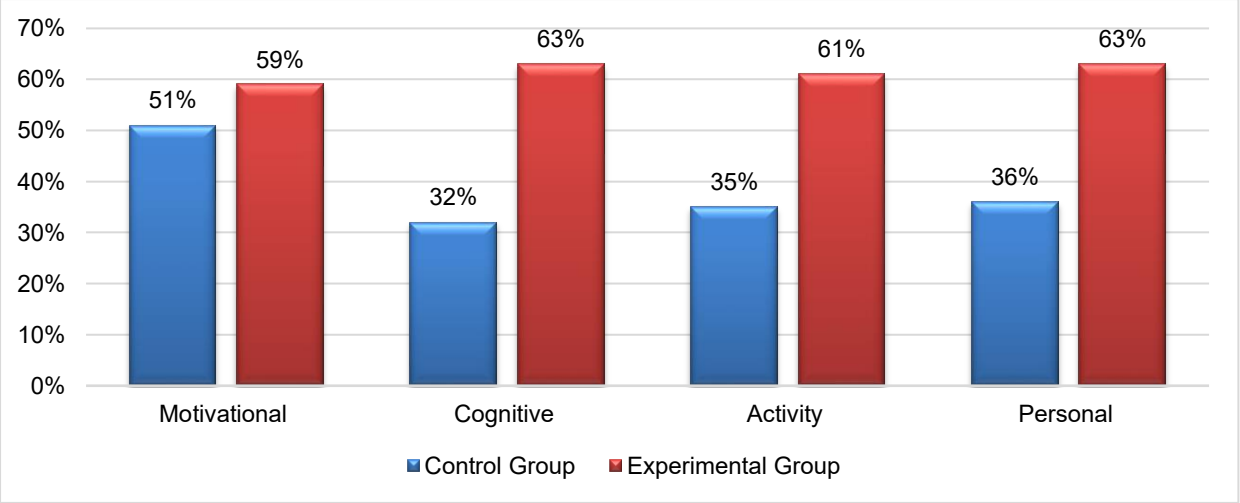

Figure 2. Average level of readiness for health activities.

The low level of readiness for health activities was demonstrated by (Figure 3):

- By motivational criterion – CG – 38%, EG – 21%.
- By cognitive criterion – CG – 56%, EG – 19%.
- By activity criterion – CG – 52%, EG – 20%.
- By personality criterion – CG – 51%, EG – 18%.

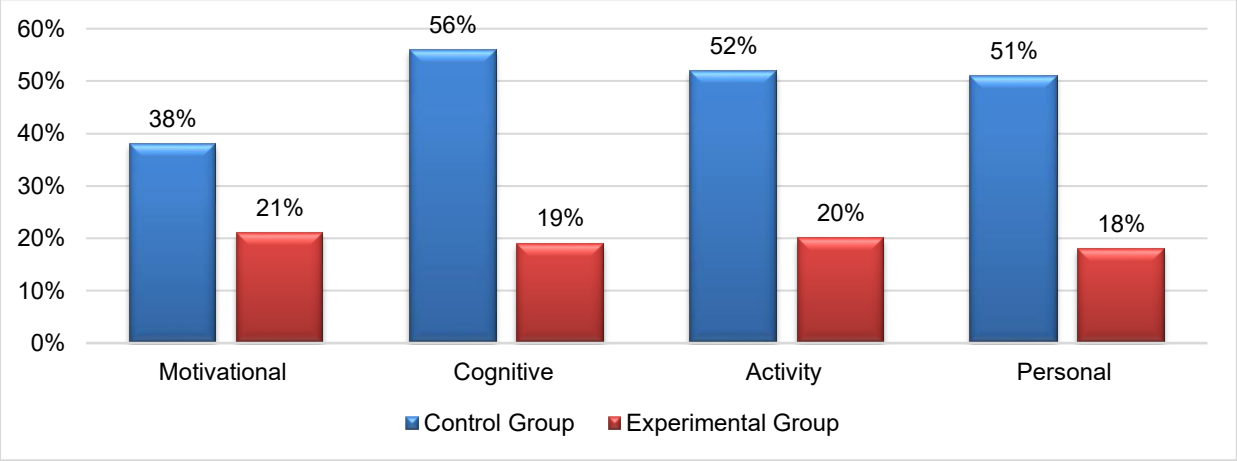

Figure 3. Low level of readiness for health activities.

It should be noted that at the **ascertaining stage**, before the formative stage of the experiment, the following general results were obtained (Figure 4):

- **A high level** of readiness for health-improving activities was demonstrated by – CG – 6%, EG – 7%.
- **An average level** of readiness for health-improving activities was demonstrated by – CG – 31%, EG – 48%.
- **A low level** of readiness for health-improving activities was demonstrated by – CG – 63%, EG – 45%.

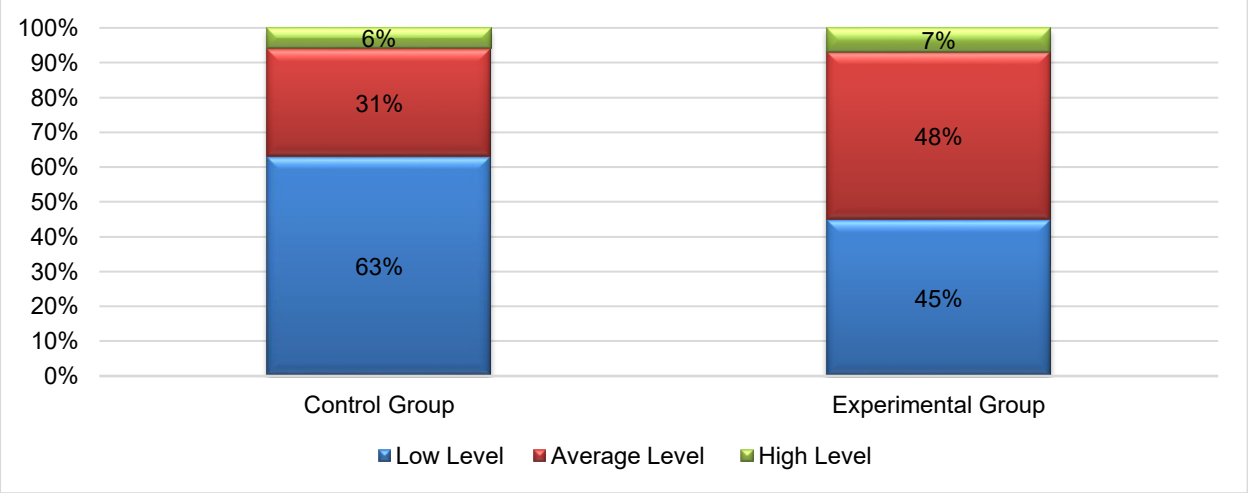

Figure 4. Levels of readiness for health-improving activities at the ascertaining stage of the experiment.

At the end of the pedagogical experiment (**formative stage of the study**), the following general results were obtained (Figure 5):

- **A high level** of readiness for health activities was demonstrated by – CG – 12%, EG – 19%.
- **An average level** of readiness for health activities was demonstrated by – CG – 38%, EG – 62%.
- **A low level** of readiness for health activities was demonstrated by – CG – 50%, EG – 19%.

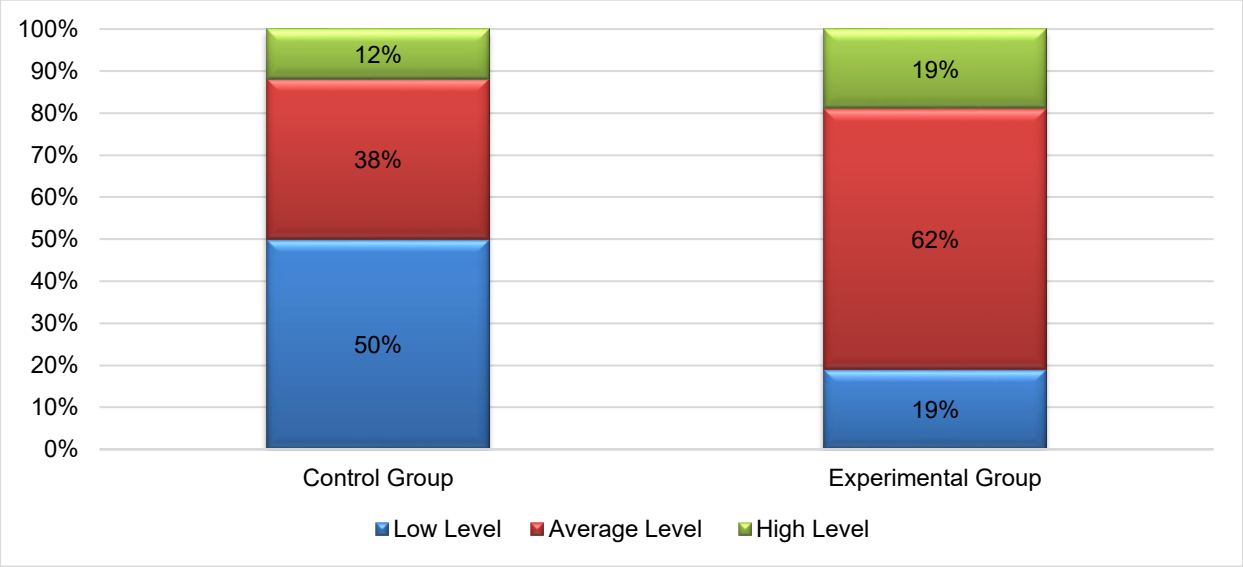

Figure 5. Levels of readiness for health-improving activities at the formative stage of the experiment.

As a result of the conducted formative stage of the pedagogical experiment, we believe that in the experimental groups, we note a significant increase in the level of readiness of future specialists for health activities through the use of digital technologies. In the respondents of the control group, the increase in the level of readiness of future specialists for health activities is not significant.

In particular, we note that the increase in the experimental group is 12%, with a high level of readiness of future specialists for health-improving activities compared to an increase in the control group of only 5% in the number of students with a high level.

There was also an increase in the experimental group of 14% with an average level of readiness of students for health-improving activities, compared to an increase in the control group of 7% in the number of students with an average level.

There is a positive trend in the decrease in the experimental group of 26% in the number of students with a low level of readiness of future specialists for health-improving activities, compared to a decrease in the control group of 13% in the number of students with a low level of such readiness.

For the effectiveness of the system of professional training of future specialists in physical culture and sports for health-improving activities, an analysis was conducted based on the results of factor analysis of the experimental data obtained. At the end of the pedagogical experiment, the analysis of the factor structure of the components of readiness for health activities of students in the experimental group proves that the implementation of the developed special course and system contributed to qualitative changes, which are reflected in each selected factor by a change in the significance of the structural individual components of readiness and in the general structure of the respondents' readiness.

The structure of the readiness of future specialists for health activities of the control and experimental groups for the pedagogical experiment does not differ practically: in terms of the contribution of the factor to the total variance and in the structure of individual factors.

This indicates the homogeneity of the contingencies of the experimental and control groups before the experiment and allows us to confirm the previously applied statistical methods.

Factor analysis of the structural components of the readiness of future specialists for health-improving activities at the end of the pedagogical experiment showed that the results of the control group practically did not change, and at the end of the pedagogical experiment, under the influence of the implementation of the developed system and the conduct of the author's special course, significant qualitative changes occurred in the students of the experimental group, which are reflected in the general structure of readiness and in each selected factor by a change in the significance of individual structural components of readiness.

Conclusions

The importance of the health work of specialists for the field of physical culture and sports is proven, and ways to improve the main areas of training in higher education, in particular, by using digital technologies to improve the quality of physical culture personnel for the organization of a health environment at the stage of modern development of society.

The role of educational and training, methodological, and practical classes for the organization of a health environment is clarified. The components of physical culture and the components of the health preservation direction are described for the purpose of using digital technologies, using measures and means of the health function of physical culture, namely physical culture and health technologies; tasks and rules of modern health work.

The general hypothesis of the study was based on the statement that in higher education institutions, the training of future specialists in physical education and sports will be successful and high-quality if the developed system of their professional training for health-improving activities is implemented in the educational process through the use of digital technologies.

Our own teaching experience and theoretical analysis of the literature allowed us to determine the criteria for the formation of the readiness of future specialists in physical education and sports for health-improving activities. The criteria include motivational, cognitive, activity, and personal. The indicators of each criterion are substantiated.

We characterized the selected levels (high, medium, low) of the formation of the readiness of future specialists in physical education and sports for health-improving activities.

The experiment to test the effectiveness of the system of training future specialists for health-improving activities in physical education and sports included ascertaining, forming, and generalizing stages.

The experiment involved students assigned to the control group (n = 80) and the experimental group (n = 82).

Students in the control group studied at higher education institutions using traditional methods during their professional training, and in the experimental group, pedagogical conditions and a special course “Innovative system of professional training of future specialists in physical culture and sports for health-improving activities through the use of digital technologies” were developed and introduced.

As a result of the formative stage of the pedagogical experiment, we believe that in the experimental groups, we note a significant increase in the level of formation of readiness of future specialists for health-improving activities. In the respondents of the control group, the increase in the level of formation of readiness of future specialists for health-improving activities is not significant.

For the effectiveness of the system of professional training of future specialists in physical culture and sports for health-improving activities, an analysis was conducted based on the results of factor analysis of the experimental data. At the end of the pedagogical experiment, the analysis of the factor structure of the components of readiness for health activities of students in the experimental group proves that the

implementation of the developed special course and system contributed to qualitative changes, which are reflected in each selected factor by a change in the significance of the structural individual components of readiness and in the general structure of the respondents' readiness.

The structure of the readiness of future specialists for health activities of the control and experimental groups for the pedagogical experiment does not differ practically: in terms of the contribution of the factor to the total variance and in the structure of individual factors.

This indicates the homogeneity of the contingencies of the experimental and control groups before the experiment and allows us to confirm the previously applied statistical methods.

Factor analysis of the structural components of the readiness of future specialists for health-improving activities at the end of the pedagogical experiment showed that the results of the control group practically did not change, and in the students of the experimental group at the end of the pedagogical experiment, under the influence of the implementation of the developed system and the conduct of the author's special course, significant qualitative changes occurred, which are reflected in the general structure of readiness and in each selected factor by a change in the significance of individual structural components of readiness.

We see the prospect of further research in the development of a system for training future specialists in physical culture and sports for coaching activities. Further study is required to analyze the implementation of advanced foreign experience, the use of information and communication technologies in the training of future specialists in physical culture and sports, and to further improve the effectiveness of their professional training in higher education institutions.

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