Formation of ICT competence in future specialists of physical education and sports in the conditions of distance learning

Формування ІКТ-компетентності у майбутніх фахівців фізичної культури та спорту в умовах дистанційного навчання

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**Tetyana Koycheva[5]**
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Abstract

The article clarifies the peculiarities of the professional training of future specialists in physical culture and sports in institutions of higher education in the conditions of distance learning; the specifics of professional training of future specialists are considered; the types of distance learning, which differ in communication strategy and means of information transmission, are revealed; the features of remote and electronic learning methods for quality training of future specialists have been proven. The purpose of the article is to find out the basics of the formation of ICT competence among future specialists in physical culture and sports in the conditions of distance learning. The methodological basis of the article is a systematic combination of system-forming interrelated factors (goals, forms, and methods of pedagogical influence, principles, subjects, and conditions of the educational process, means of

Анотація

У статті з'ясовано особливості професійної підготовки майбутніх фахівців з фізичної культури і спорту у закладах вищої освіти в умовах дистанційного навчання; розглянуто специфіку професійної підготовки майбутніх фахівців; розкрито типи дистанційного навчання, що різняться комунікативною стратегією та засобами передачі інформації; доведено особливості методів дистанційного й електронного навчання для якісної підготовки майбутніх фахівців. Метою статті є з'ясувати основи формування ікт-компетентності у майбутніх фахівців з фізичної культури і спорту в умовах дистанційного навчання. Методологічною основою статті є системне поєднання системо-твірних взаємопов'язаних факторів (мети, форм і методів педагогічного впливу, принципів, суб'єктів та умов освітнього процесу, засобів навчання, змісту освіти). Обґрунтовано педагогічні умови

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education, and content of education). The pedagogical conditions for the formation of ICT competence among future specialists in physical culture and sports for the effective and rational application of distance learning technologies are substantiated.

Keywords: professional training, future specialists in physical culture and sports, higher education institutions, distance learning, types of distance learning.

формування ікт-компетентності у майбутніх фахівців з фізичної культури і спорту для ефективного й раціонального застосування технологій дистанційного навчання.

Ключові слова: професійна підготовка, майбутні фахівці з фізичної культури і спорту, заклади вищої освіти, дистанційне навчання, типи дистанційного навчання.

Introduction

In connection with the dominance of the Internet in the world, and the constant growth of its communication and information capabilities, distance education is developing at a rapid pace. The use of distance education in the educational process of a higher school requires a qualitative analysis of the priorities of factors, a qualitative modernization of innovative technologies, the development of knowledge acquisition methods, consideration of other mechanisms that effectively affect the acquisition of knowledge by students and the work of teachers in a distance format (Tsybulko & Hloba, 2021).

The formation of the information society involves the preparation of citizens for life in the conditions of the growth of information processes and the globalization of the information space, which increases the requirements for the quality of educational training of modern specialists in the field of the use of information and communication technologies (ICT) in professional activities – the formation of their information competence (Ladyka et al., 2015).

The idea of continuous education finds its practical embodiment in all spheres of education and the professional education of physical culture and sports specialists. In the conditions of the creation of the European space, at the current stage of higher physical education, the main development for the quality of an individual's life is the improvement of the quality of training of competitive specialists in physical culture and sports with a high level of professionalism, professional knowledge, and competitiveness. Open distance education is one of the effective forms of high-quality higher education aimed at meeting the educational needs of young people, and the development of online courses is facilitated by the availability of the Internet (Chukhlantseva, 2017).

All this poses fundamentally new tasks for the teaching staff and presents increased requirements for material, technical, and methodical support of the educational process, forms, and methods of training future specialists in physical culture and sports. Therefore, at the current stage, special attention should be paid to the quality organization of the educational process in institutions of higher education, in particular, to the implementation of distance learning in the training of future specialists in physical culture and sports.

Literature Review

According to the leading experts in the field of informatization of education, today the capabilities of information technologies significantly outstrip the practice of their effective use in the educational process. If there is already some experience in certain disciplines (economics, physical-mathematical, technical, and informatics), the results of applying the achievements of modern ICT in humanitarian specialties, including physical culture and sports, look significantly more modest or are absent at all. This is because teachers and students in the specified subject areas do not know the tools and methods of informatics well enough and do not imagine its rapidly growing possibilities.

I. Samokhvalova, & S. Kharchenko (2022) summarized scientific research in the field of physical culture and sports, determining the peculiarities of motor activity, physical capacity, the necessary level of physical health of future specialists in physical culture and sports, and proved the influence of the direction of future professional activity on the development of motor skills of students; showed the importance of developing the endurance strength of education seekers.

I. Kryventsova (2020) devoted her research to the search for effective ways and methods of

engaging students in distance education to physical exercises; outlined the forms and topics of distance learning in physical culture and sports, assessed the activity of education seekers during distance and face-to-face learning; determined the place, role, and distance learning opportunities in physical education and sports for students and teachers.

N. Terentieva (2019) analyzed the current state of distance education in the process of professional training of specialists in Physical Culture and Sports and Secondary Education (Physical Culture); for professional training of future specialists presented the negative and positive aspects of the implementation of distance education, taking into account the specifics of the region and the characteristics of the student contingent.

S. Lazorenko (2021), a solution to the problem of forming an information and digital culture for future specialists in physical education and sports was proposed in the conditions of distance and mixed learning; in the conditions of distance and mixed learning, the practical issues and theoretical foundations of the formation of the information and digital culture of the future specialist are substantiated.

L. Tsybulko, & H. Hloba (2021) highlights the features of distance learning and shows the features of the organization of the educational process of future physical culture and sports specialists in the conditions of quarantine and certain restrictions regarding the full-fledged educational process in higher education institutions; emphasis is placed on mobility, flexibility of education, adequacy of analysis and adaptation to new situations, and use of existing skills, abilities, and knowledge with modern information technologies.

O. Dubovoi, V. Babych, V. Dubovoi, V. Zaitsev, S. Haliuza, P. Hordienko, & Ya. Malkova (2021), based on a systematic approach, devoted their research to the professional training of physical culture and sports specialists in the conditions of distance learning. It is noted that the professional training of specialists in institutions of higher education in the conditions of distance learning is an extremely urgent problem.

N. Byshevets, N. Honcharova, & M. Rodionenko (2020) found out the peculiarities of training students in physical culture and sports and the conditions of distance education; emphasizing the importance of increasing the applied and scientific potential of higher education, which

ensures professional orientation; in the process of forming computer modeling skills, the ways of improving didactic electronic support, future specialists are outlined.

At the same time, the analysis of research in modern pedagogical science shows that there are certain theoretical prerequisites for solving the task of developing a methodology for the formation of information competence in distance education: numerous studies have been conducted devoted to the pedagogical aspects of the formation of information competence of specialists; conducted research dedicated to the training of future physical culture specialists in the conditions of informatization of education, information provision of physical culture for students of educational institutions, increasing the level of professional competence based on the use of information tools in distance learning, pedagogical design of professional training of physical culture specialists using information technologies.

At the same time, taking into account the significant number of studies on the problems of forming ICT competence among future specialists in physical culture and sports in the conditions of distance learning, the problem of forming their professional competence in the process of pedagogical practice, which, combining theory and practical activity, provides preparation for future teaching activities in conditions as close as possible to professional ones. In modern conditions, when determining and increasing the level of physical fitness of the population of Ukraine, creating appropriate conditions for the physical development of various groups of the population, and improving their health are recognized as important tasks of the state and society, the structure of informational competence of physical culture specialists, criteria and level of its formation, requires theoretical substantiation and practical verification of ways of forming the professional competence of future teachers of physical culture in the conditions of pedagogical practice.

The purpose of the study: is to find out the basics of the formation of ICT competence among future specialists in physical culture and sports in the conditions of distance learning.

Methodology

To achieve the goal of the research, a set of methods was used:

- general scientific (analysis, generalization, comparison, synthesis) to study the state of training in institutions of higher education of future specialists in physical culture and sports in the conditions of distance learning, experience in the theory and practice of organizing a quality educational process;
- historical-chronological to determine the periods of formation and prerequisites for the training of future specialists in physical culture and sports in the conditions of distance learning;
- empirical (analytical, comparative for pedagogical and historical analysis of literature; search and bibliographic for systematization of printed sources, library catalogs, periodicals);
- historical and comparative to compare the content of the training of future specialists in physical culture and sports in the conditions of distance learning from the point of view of teachers and scientists.
- historical-retrospective to reveal patterns of development of historical events, cause and effect relationships, to highlight trends and characteristic features of training future specialists in physical education and sports in conditions of distance learning;
- methods of mathematical and statistical processing of the obtained experimental data.

We will single out the methodological principles of the study of the training of future specialists in physical culture and sports in institutions of higher education in the conditions of distance learning.

The philosophical level of the research methodology is characterized by an existential (an important factor in the success of the professional training of future specialists in physical culture and sports in higher education institutions in the conditions of distance learning is the creation of conditions to form in the students of education their system of motives and meanings) approach and a dialectical (conditions the need for awareness, identifying, overcoming internal and external contradictions) approach.

The general scientific level of the methodology is manifested in the systemic approach because it involves a systematic combination of system-creating interrelated factors (goals, forms, and methods of pedagogical influence, principles, subjects, and conditions of the educational process, means of education, the content of education);

The concrete-scientific level of the methodology requires the involvement of activity, professional, innovative, personal, reductive, healing, bio-sociocultural, and gender approaches to the training of future specialists in physical culture and sports in higher education institutions in the conditions of distance learning.

The technological level of the methodology is determined by teaching methods in the conditions of distance education during the professional training of future specialists in physical education and sports in institutions of higher education.

In higher education institutions, for various conditions of training specialists in physical culture and sports, the problem of clarifying specific scientific methodology remains open – distance learning, mixed learning, mobile learning, etc.

Results and Discussion

The professional training of future specialists in physical culture and sports in higher education institutions is most often associated with long and repeated absences by students of academic classes, which occur during trips to educational and training meetings, intense educational and training activities, participation, and preparation in competitions. For such education seekers, a special form of educational process is needed, which would not be inferior to the traditional form of education in terms of efficiency. Distance education is one of those forms that, in connection with the spread of the most modern information technologies, for example, multimedia and network hypermedia, received a powerful development impulse. The specificity of training future specialists in physical culture and sports in institutions of higher education makes this issue even more relevant (Choi et al., 2021).

The above-mentioned changes are manifested most concentratedly in the distance education system, which is an organization at a distance of the educational process, when the teacher and students are geographically or physically distant, which is education through the Internet and other computer and communication channels, which can be characterized as modern, at a distance, a form of education using multimedia systems, new information technologies, which makes it possible to eliminate the shortcomings of the traditional correspondence form of education; ensures a close and intensive two-way exchange of information between the teacher and students.

The use of online conversations (chat), and video conferences expands the scope of interactive interaction and creates the effect of presence (Ladyka et al., 2015).

We will reveal two types of distance learning for future specialists in physical culture and sports in institutions of higher education, which differ in communicative strategy and means of information transmission.

The first type includes traditional distance learning.

The second type is electronic distance learning.

When preparing future specialists in physical education and sports in institutions of higher education, the participants of the educational process interact using various means: in the first type of distance learning, pedagogical communication is implemented using the mobile communication system and mail, in the second type – based on Internet communications.

At the same time, the technology of electronic and distance learning is a mandatory component of mixed learning, and operates a system of innovative methods, to implement a targeted set of pedagogical influences.

Peculiarities of distance and electronic learning methods for quality training of future specialists in physical culture and sports are determined, first of all, by the specifics of their implementation in an informational and educational environment and a computer-oriented environment. Such a telecommunications software environment ensures the organization of the educational process and provides high-quality informational support for education seekers with the help of special technological means and methods.

Distance and electronic learning methods include the following: exploratory, informational, receptive, algorithmic, reproductive, and heuristic, correlated with the methods of face-to-face traditional education. Let's emphasize the logical sequence of use: at the stage of processing a certain amount of material by students, it is worth using methods: algorithmic, receptive, informational, and reproductive, during the involvement of students in cognitive independent activity and assimilation of the studied material – heuristic and research (Plakhotnik et al., 2023).

With the penetration of elements of distance learning into the traditional pedagogical practice, their mutual enrichment and integration are observed. Therefore, the combination of computer-oriented methods and traditional teaching methods can be successful in the mixed training of future specialists in physical culture and sports in higher education institutions in the process of professional training (Tsybulko & Hloba, 2021).

Within distance learning, in addition to all existing traditional didactic principles, new innovative principles are implemented (the principle of ensuring the security of information that exists during distance learning; the principle of mobility of learning; the principle of pedagogical expediency of using new information technologies; the principle of compliance with innovative learning technologies) that are possible when using modern information technologies. With this approach, distance courses created based on traditional and innovative principles are aimed at individualizing the education of students of higher education, their creative self-realization, modern quality education, and the formation of a spatial worldview (Stefanenko, 2002).

The professional training of future specialists in physical culture and sports in institutions of higher education in the conditions of distance learning is carried out with the help of various forms of distance learning, in particular:

- Adaptive learning, the educational process is aimed at adapting methods and educational materials to the needs of the student of education;
- E-learning, this form of education is conducted on the Internet with the help of electronic mass media;
- Blended learning – combines face-to-face and online learning, which provides a higher level of independence in the learning process;
- Flipped classroom uses a model of the educational process in which students of higher education are directed to independent work at home, a form of education where the student actively cooperates with a teacher and other students in an interactive educational space): watching video lectures, master classes, etc.;
- MOOCs are open Internet online courses that are freely available to all students of education and include open educational materials for cooperation and interaction between students of education;

– DOCC – such joint open educational courses in which teachers at a higher education institution have the opportunity to create their own educational version of the course have the opportunity to develop additional materials for their students for cooperation in the network;
– SPOC – Internet courses used as blended learning;
– Open source software (OSS) – open educational resources (OER), where any Internet material is available and free;
– Open Educational Resources (OER) – the openness of part of the content of the educational space or data, for their free use by education seekers, for storage and distribution (Lishchynska, 2017).

In higher education institutions, working with information in the "Cloud" is of great importance for high-quality professional and innovative training of future specialists in physical culture and sports in the conditions of distance learning.

Consider the structure of working with information in the "Cloud", which is represented in the form of a pyramid, the base of which is the "infrastructure" as a set of physical devices (hard drives, servers, etc.), above it there is a "platform" that builds a set of services and the top, which outlines software that is affordable and meets the demand of education seekers (Chao, 2012).

For the high-quality application of cloud technologies in the educational process, we will highlight the following innovative models of providing educational services:

• a form of PaaS cloud services – Platform as a Service provides a development environment as a service (the teacher is provided with an integrated interactive platform for deployment, testing, development, and support of distance courses located on the "cloud" infrastructure;
• a type of SaaS cloud service, software as a service uses a multi-subscriber architecture: an unlimited number of students can access a separate application through a browser, which is of greatest interest to educational institutions, as it does not require upfront investments in the server or software licensing. Then the data and related programs are stored in the "cloud", and students need only a web browser for quality work.

Valuable for the professional innovative training of future specialists in physical culture and sports in the conditions of distance learning are the developments of the Google Corporation, which provides various services and applications with free access to the window of any browser with an Internet connection (Google Chrome, Mozilla Firefox, Microsoft Edge, Opera, etc.). The most used in higher education institutions are Google services: Google Translate – translator, Google Maps – set of maps, Gmail – free e-mail, Google Docs – online office, Google Knol – wiki-encyclopedia, YouTube – video hosting, Google Sites – free hosting, which uses wiki technology (Shor, 2011). A special place among the services is occupied by the free package for institutions of higher education, Google Apps Education Edition, which includes all the features of the professional package. Google Apps Education Edition provides cloud-based web applications that provide educators and educators with the tools they need to collaborate and communicate effectively (Koval et al., 2023).

We conducted an experimental study to check the effectiveness of the formation of ICT competence among future specialists in physical culture and sports in the conditions of distance learning. In the process of research, the main stages of the formation of ICT competence of students of higher education institutions are highlighted. We will describe the main stages of forming students' ICT competence within the framework of distance learning.

The first stage is motivational. This stage involves the formation, mainly, of the motivational and value components of students' ICT competence. At this stage, activities were carried out aimed at forming students' attitudes to mastering and understanding knowledge and skills in the field of ICT, and digital technologies; the formation of value orientations among students; to diagnosing the level of formation of the components of ICT competence of future specialists in physical education and sports.

The second stage is updating. This stage involves the actualization of knowledge and skills in the field of informatics and ICT, obtained earlier when studying the disciplines of informatics and ICT in professional activity; the study was aimed at the predominant formation of the general user component of ICT competence. At this stage, activities aimed at forming knowledge, skills, and personal attitudes for working with modern information, communication, and digital technologies were carried out; use of digital

resources, databases, and local and global computer networks; for interaction in IOS; to ensure information security and compliance with medical and sanitary norms and rules. The stage is aimed at the systematic use of existing skills in everyday and professional contexts (context of future professional activity).

The third stage is the main one. The purpose of this stage was the formation of general pedagogical, subject-pedagogical components of ICT competence. During the formation of the general pedagogical component of ICT competence, students were trained to solve professional pedagogical tasks related to the use of ICT tools. The formation of the subject-pedagogical component of ICT competence is aimed at expanding and deepening the formed knowledge, skills, and personal attitudes of students, taking into account the specifics of educationally significant digital technologies.

The fourth stage is summarizing. The main goal of this stage is the expansion, deepening, and generalization of the formed knowledge, skills, and personal attitudes of future specialists in physical culture and sports, taking into account the specifics of professional activity with the use of information and communication and educationally significant digital technologies, diagnosis of the formation of all components of ICT competence in their interconnection.

At all four stages, it was mandatory to use special didactic tools that ensure the purposeful formation of students' ICT competence.

Let's consider in more detail the stages of students' ICT competence formation, which are implemented by the sections of the IT courses.

The goal of the motivational stage is the formation of the mainly motivational and value components of students' ICT competence.

In the class, students need to demonstrate the prepared master classes and involve others studying in this activity for each student to independently practice exercises with office programs and information systems (Nekrasov et al., 2023). Students should be invited to consider the types of teacher activities in which it is necessary to use these technologies and to discuss the advantages of using office technologies and information systems for solving professional tasks by the teacher.

The seminar session (scientific and practical seminar) "Digital Technologies in the Field of Education" provides for the active inclusion of students in the discussion of digital technologies used in the field of education, specifying the goals of using various educationally significant digital technologies in institutions of higher education. It was suggested to the students to carry out an overview of the ICT technical means used at the current stage, to discuss the safety rules when working with these technical means. For such a lesson, students prepared material in a short abstract form with multimedia support (presentation, video presentation, video clip, infographic, etc.) on the stated topic. At the seminar (under distance learning conditions), future specialists in physical culture and sports presented the prepared material and discussed it. Exemplary topics for speeches in this class were: "Digital services in professional activity", "Interactive equipment in a higher education institution", "Cyber security in working with digital technologies", "Mobile technologies in the professional activity of a specialist" and others.

At the laboratory-practical session "Designing a didactic game on ICT equipment for students", students were offered the activity of developing and designing a didactic game on ICT equipment (according to the proposed topics) in various directions (social-communicative development, cognitive development, speech development, artistic aesthetic development, physical development). During the performance of this work, project activities were organized with students.

To perform the project activity, the students had to: choose a project topic from the list of proposed topics, formulate the project problem; determine the purpose of the project by the chosen subject area; and formulate project tasks to achieve the set goal; develop a project plan; determine sources of information for obtaining project materials; prepare basic and additional equipment for project implementation; build a model or diagram of the project result; implement the project and receive project products; prepare a report, justify the design process, explain the obtained results; present the project and defend its results.

In this lesson, students were offered the following ICT equipment with the appropriate software or digital service: IQ Board interactive board (IQ Board Software), SMART SPNL 6025 interactive panel, UTSKids interactive table (ALMA), iMO-LEARN interactive cubes. This interactive equipment is located in the laboratories of the institution of higher education.

After choosing one of the devices, the students performed an interactive didactic task in a game form. This made it possible to find out the basics, criteria, and requirements for the development, maintenance, and use of didactic games on ICT in the educational process.

During the classes, the students were given the following tasks:

1. Prepare the necessary information and communication equipment (Lego Education Wedo constructors, laptops, video content, interactive whiteboard or interactive panel, mobile planetarium, etc.) and toolboxes (office supplies, paper, cardboard, etc.).
2. Develop notes from lectures using robotics.
3. Prepare forms with objective and subjective experts' evaluation criteria for the competitive task.

At the updating stage, the organization of students' activities in lectures, seminars, and laboratory-practical classes, aimed at updating the basic knowledge and skills acquired earlier, was foreseen.

To update and deepen the theoretical material, blended learning technology was used, since the training contains theoretical material that can be studied remotely, thus, more time was allocated to practicing practical skills. Thus, students were offered an online micro-course "Computer as a means of automating information processes" (the micro-course developed by the students was created on the Stepik.org platform, which is an educational platform and designer of online courses), which contains theoretical material, presentations, test tasks. Students independently studied theoretical material, concepts, and information, performed test tasks from the studied material.

Also, at the actualization stage of students' ICT competence formation, e-learning technology was applied, one of the features of which is that students worked independently in an interactive mode with educational materials, such as video classes, multimedia presentations, audio files, etc., and then performed tasks for the studied topics underwent current and control testing.

55 students, 22 teachers, and 15 employers took part in the experiment at its various stages (declarative, exploratory, formative).

In the process of experimental work on the approbation of the system of forming students' ICT competence, various methods were used:

questionnaires and testing of students; conversations with teachers, students; expert assessment of the content of classes by students and teachers; studying the products of student activity; experimental teaching; application of adapted methods.

By the objectives of the ascertainment stage of the experiment, students, teachers, and employers were offered questionnaires and tests developed by us, including questions of various types, and a conversation was held. We will describe and analyze the obtained results.

According to the objectives of the first stage of the experiment, it was necessary to find out the opinion of third-year students regarding the role of ICT in their future professional activities.

Students were asked to express their opinions on the statements proposed in the questionnaire and rate them on a 10-point scale.

Conditionally proposed statements can be divided into four categories: Category I – statements about the general importance of ICT competence for a modern specialist; Category II – statements regarding the use of ICT in professional activities; Category III – statements about the use of ICT, which promotes the development of intellectual, creative abilities, visual thinking; creates conditions for modeling life situations, enables the use of educational and developmental computer games; Category IV – statements regarding the use of ICT in working with students who have limited health opportunities.

The analysis of the obtained results showed that when evaluating the statements of the 1st category, the majority of respondents (76%) note the importance of ICT competence for a modern specialist, while only 47% of students highly appreciate the need to use ICT at work. Evaluating statements of the II category, the majority of students (65% and 59%) emphasize the need to use ICT in formal activities and the methodical work of a specialist. Fewer students (47%) emphasize the need to use ICT in higher education institutions. At the same time, evaluating the statements of the III category, 23% of respondents underestimated the possibilities of ICT for modeling life situations that cannot or are difficult to show and see in everyday life. 18% of students do not sufficiently understand the possibilities of using ICT for the development of intellectual and creative abilities, the ability to independently acquire new knowledge. Evaluating statements of category

IV, the majority of respondents (65%) highly evaluate ICT capabilities, while 23% of students set low scores for evaluating this category of statements.

At the ascertaining stage of the experiment, students were tested, which was aimed at determining the residual knowledge of informatics and ICT. It was found that no work was completed for grade 5 (excellent), about 22% of students completed grade 4 (good), most respondents (about 60%) completed grade 3 (satisfactory), for grade 2 (unsatisfactory) approximately 18% of works (Table 1).

Table 1.
The results of testing students to determine the residual knowledge of informatics and ICT

Rating			
«Excellent»	«Fine»	«Satisfactorily»	«Unsatisfactorily»
0%	22%	60%	18%

As a result of the research, it turned out that the majority of students (more than 90%) do not know the rules and stages of building websites. The majority of students do not know enough types of text formatting, and more than 70% incorrectly establish the correspondence between types of formatting and their characteristics. Students do not know how to work with the MS Excel program well enough, they do not have the terminology specific to this program. Students do not sufficiently understand the principles of database operation and do not know the terminology and concepts of databases and DBMS (database management system).

During the classes, it was found that students do not have a good enough command of safety rules, sanitary-epidemiological rules, and regulatory documents when working with ICT technical means in distance learning conditions. For example, students do not comply with the requirement "The distance from the eyes to the monitor screen should be at least 50 cm."

Thus, the results of the students' testing made it possible to reveal the insufficient level of knowledge and skills of students in informatics and ICT, which may be needed when using ICT in their future professional activities.

A conversation was held with teachers of various disciplines and interdisciplinary courses regarding the importance of ICT competence for a future teacher, which made it possible to find out that teachers highly appreciate the importance of ICT competence of a modern specialist and the need to develop ICT competence in the conditions of distance learning.

The analysis of the results of our survey of employers showed that a modern employer needs a specialist in distance learning conditions to have the ability to: 1) organize classes using digital technologies in distance learning conditions; 2) organize various methods using modern digital technologies; 3) analyze the process and results of the organization of various types of activities using technical means of ICT and mobile technologies in the conditions of distance learning; 4) develop and prepare methodical and didactic materials using a PC in the conditions of distance learning.

Thus, the results of the ascertaining stage of the experiment allow us to conclude the need to increase the level of students' ICT competence, taking into account all its structural components: value-motivational, general-purpose, general educational, and subject-specialist.

The exploratory stage of the experiment made it possible to determine another way that allows you to check the quality of training of physical culture and sports specialists in the conditions of distance learning, and the level of development of their professional competencies – this is participation in the WorldSkills championships.

The experts were asked to highlight the methods, forms, means of learning, and technologies: project method, simulation game, design thinking, mobile technologies, distance learning, gamification, multimedia equipment (MM equipment), electronic UMK, and electronic educational resources (EER). Most of the experts- teachers (60%) liked mobile technologies. These technologies turned out to be interesting, as they are a new and relevant direction of modern education.

The next stage was carried out based on a set of diagnostic methods and included an assessment of the dynamics of the formation of components of ICT competence of students in physical culture and sports in the conditions of distance learning.

To diagnose the formation of the motivational and value component of the ICT competence of future

specialists in physical education and sports in the conditions of distance learning, the methods of assessing the educational motivation of students in the field of ICT, assessing the student's value orientations in the field of informatics and ICT were used.

Assessment of students' educational motivation in the field of ICT was carried out at the initial and final stages of the experiment. The results of the analysis of students' answers are presented in Fig. 1.
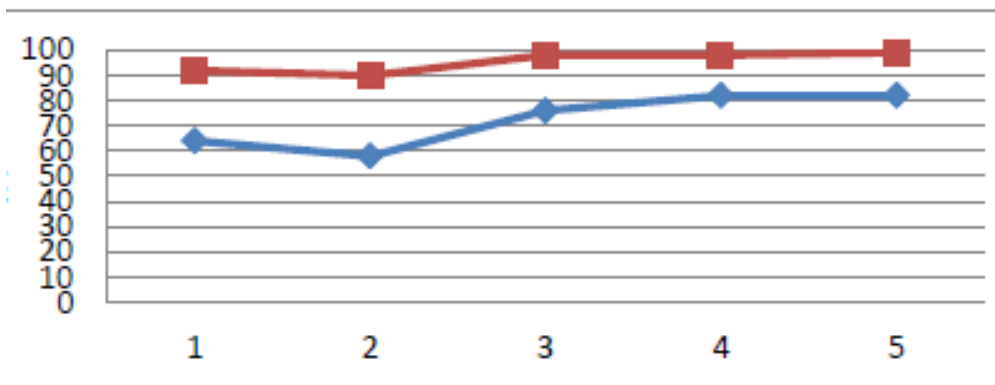
Fig. 1. The results of the analysis of the answers of future specialists in physical culture and sports in the conditions of distance learning.

The analysis of the obtained results showed that, after the end of the educational stage of the experiment, professional motives for the use of IT and digital technologies began to dominate in the majority of students, positive dynamics of changes in prestige motives and broad social motives for the use of IT and digital technologies, creative self-realization using IT and digital technologies in the conditions distance learning. At the same time, one can name the negative dynamics of motives for avoiding the failure of using IT and digital technologies.

An author's questionnaire including 5 statements was used to assess students' value orientations in future professional activities using ICT and digital technologies. Students were asked to express their opinions about these statements and rate them on a 10-point scale. The questionnaire was offered to students before and after the educational experiment.

The above allows us to state that the proposed version of the implementation of the ICT competence formation system of students

sufficiently influenced the positive dynamics of the formation of the motivational and value component of the ICT competence of physical culture and sports specialists in the conditions of distance learning.

Let's consider the methods created to identify the dynamics of the formation of the general education component of students' ICT competence in the conditions of distance learning.

Diagnostics of the formation of the commonly used component of ICT competence was carried out: based on current control during laboratory-practical work and final control based on the students' performance of general control work; using a questionnaire.

In fig. 2 shows the results of the analysis of the questionnaire filled out by students at the beginning of the 3rd year and the end of the 4th year. The histogram reflects the level of formation of theoretical knowledge and practical skills in the use of computer technology.
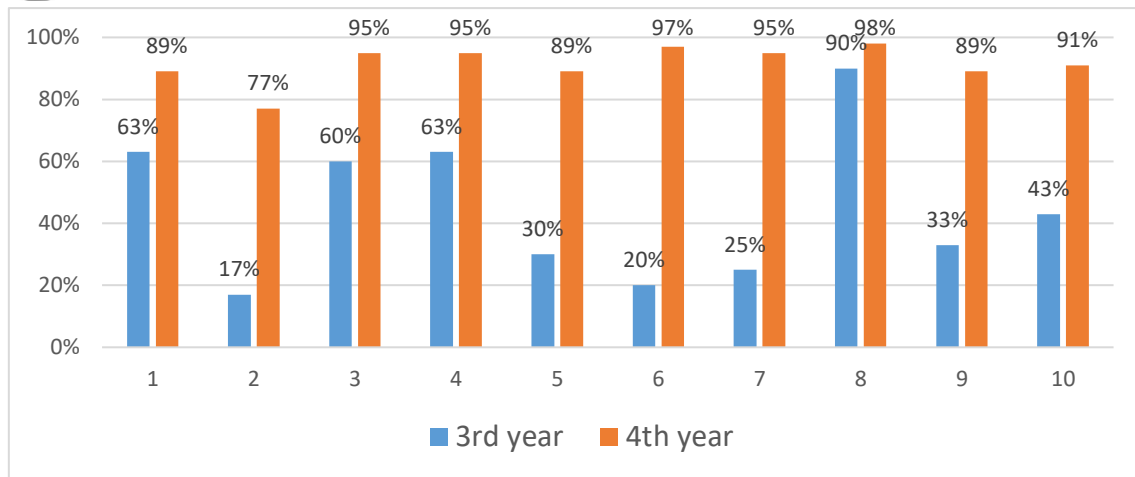
Fig. 2. Diagnostics of the formation of theoretical knowledge and practical skills in the use of computer technology to form students' ICT competence

The analysis of the obtained data showed that the number of students who studied according to the experimental method expressed their agreement with the proposed statements, and their level of ICT competence formation significantly increased at the end of the experiment.

These maps were proposed by students at the beginning of the educational stage of the experiment and the end of the educational stage of the experiment (during the period of pedagogical practice in the 4th year).

The expert assessment card included 10 items that allow checking students' theoretical knowledge and practical skills in the field of ICT use (which is necessary for the formation of ICT competence), which the expert could evaluate on a 4-point scale (0 – knowledge/skills not formed, 1 – low level of knowledge/skill formation, 2 – medium level of knowledge/skill formation, 3 – high level of knowledge/skill formation).

The final value of the level of formation of theoretical knowledge and practical skills in the field of using ICT to form ICT competence in the conditions of distance learning was determined by the sum of the scored points: <15 – low level of formation; 15-20 – average level of formation; >20 – high level of formation. The analysis of the obtained results at the end of the educational stage of the experiment showed that most students have a high level of theoretical knowledge and practical skills in the field of ICT use.

The results of the experiment allow us to conclude the positive dynamics of the levels of formation of ICT competence of future specialists in physical culture and sports in the conditions of distance learning (Dzhym et al., 2023).

Thus, the results of the experimental verification of the implementation of the methodology for the formation of ICT competence of future specialists in physical culture and sports in the conditions of distance learning confirm its effectiveness and prove its impact on the positive change in the levels of the formation of components of ICT competence, confirming the purpose of the study.

It should be noted that during the training of future specialists in physical culture and sports in the conditions of distance learning, special attention is paid to the organization of the educational process, the effectiveness and quality of which depends on the specific competencies of the teacher (Chukhlantseva, 2017).

As a result of the study, the pedagogical conditions necessary for the effective and rational use of distance learning technologies in the training of future specialists in physical culture and sports were identified:

– the duality of the nature of distance learning technologies for education seekers (they are technologies used in the educational process, and at the same time technologies that are the object of study and mastery);
– adaptation of educational material under the condition of increasing the share of independent work during distance learning should be mandatory in the modern educational space, therefore, the content of distance learning should be formed with the help of systematic didactic design;

- the formation of cognitive experience of future physical culture and sports specialists in the process of distance learning, experience of creative activity, mastering the means of activity, in the new conditions of the use of information technologies, personal attitudes;
- the basis for the organization of productive activities of education seekers when organizing distance learning should be in the course of solving educational problems;
- students and teachers possessing the skills of organizing independent study;
- preparation of students and teachers for the formation of innovative specific skills and abilities in the use of distance learning technologies (development of a distance course and support for distance learning) (Mazur, 2022).

Active implementation of the distance form of education for future physical culture and sports specialists is impossible without solving the problem of creating the material and technical basis of higher education institutions; problems of the lack of software and methodological support of the educational space and independent work of education seekers; insufficient informational preparation of professors and teaching staff of higher education institutions; problems of creating an informational environment for physical education (Ladyka, 2015; Sokoliuk, 2013).

Conclusions

Therefore, high-quality and modern training of future physical culture and sports specialists is impossible during the educational process without active use of the potential of electronic resources and platforms. Therefore, it is necessary to popularize and increase learning in a distance electronic format, the introduction of online courses, the improvement of technologies, new programs, and platforms that contribute to the creation of a convenient virtual universal environment for the perception and use of material.

The peculiarities of the professional training of future specialists in physical culture and sports in higher education institutions in the conditions of distance learning have been clarified.

Two types of distance learning of future specialists in physical culture and sports in institutions of higher education, which differ in communicative strategy and means of information transmission, are revealed.

Peculiarities of remote and electronic learning methods for quality training of future specialists have been proven.

Within distance learning, the main new innovative principles and forms are highlighted. In terms of distance learning, the features of working with information in the "Cloud" are described.

Innovative models of providing educational services are characterized by high-quality application of cloud technologies in the educational process.

The need for professional innovative training of future specialists in physical culture and sports in the conditions of distance learning developed by the Google Corporation is substantiated, by the main advantages of the Google Apps Education Edition package in the conditions of distance learning according to the description of the developers are named, the main online services based on cloud computing provided by Google are considered.

Effective pedagogical conditions are listed for the effective and rational application of distance learning technologies in the training of future physical culture and sports specialists.

An experimental study was conducted to check the effectiveness of the formation of ICT competence among future specialists in physical culture and sports in the conditions of distance learning.

We will continue further research to improve the educational space of future specialists in physical education and sports.

Bibliographic references

Byshevets, N., Honcharova, N., & Rodionenko, M. (2020). Innovative approaches to improving the educational process of future specialists in physical culture and sports. *Theory and methodology of physical education and sports*, 4, 78-85. https://doi.org/10.32652/tmfvs.2020.4.78-85

Chao, L. (2012). *Cloud Computing for Teaching and Learning: Strategies for Design and Implementation*. University of Houston-Victoria, 357. https://acortar.link/Woo0m4

Choi, S.M., Sum, K.W.R., Leung, F.L.E., Wallhead, T., Morgan, K., Milton, D., Ha, S.C.A., & Sit, H.P.C. (2021). Effect of sport education on students' perceived physical literacy, motivation, and physical

activity levels in university required physical education: a cluster-randomized trial. *Higher Education*, 81(6), 1137-1155. https://doi.org/10.1007/s10734-020-00603-5

Chukhlantseva, N. V. (2017). Functions and competencies of a tutor in the process of distance learning in higher physical education institutions. *Modern problems of physical education, sports and human health: materials of the 1st international: Internet conference dedicated to the 70th anniversary of the Faculty of Physical Education, Odesa*, October 11-12, 2017, 211-214.

Dubovoi, O. V., Babich, V. I., Dubovoi, V. V., Zaitsev, V. O., Haliuza, S. S., Hordiienko, P. Yu., & Malkova, Ya. P. (2021). Problems of professional training of future specialists in physical culture and sports in conditions of distance learning in universities. *Bulletin of Taras Shevchenko Luhansk National University: Pedagogical Sciences*, 6(344), Part 2, 40-48. https://doi.org/10.12958/2227-2844-2021-6(344)-2-40-48

Dzhym, V., Saienko, V., Pozdniakova, O., Zhadlenko, I., & Kondratenko, V. (2023). Intensification of sport activities in the process of training higher education seekers of various specialities. *Revista Eduweb*, 17(2), 43–53. https://doi.org/10.46502/issn.1856-7576/2023.17.02.4

Koval, V., Kushnir, A., Vorona, V., Balakirieva, V., Moiseienko, N., & Golubenko, N. (2023). Formation of future specialists research competence in the process of professional training. *Amazonia Investiga*, 12(63), 77-86. https://doi.org/10.34069/AI/2023.63.03.7

Kryventsova, I. V., Klymenchenko, V. G., & Ivanov, O. V. (2020). Distance education in physical education during the quarantine period. *Physical rehabilitation and recreational and health technologies*, 5(2), 98-103. http://dspace.hnpu.edu.ua/handle/123456789/3686

Ladyka, P. I., Shandryhos, H. A., & Shandryhos, V. I. (2015). Peculiarities of the application of distance learning during the teaching of sports and pedagogical disciplines. *Physical Education, Sport and Health Culture in Modern Society*, 3(31), 32-35. https://www.sport.vnu.edu.ua/index.php/sport/article/view/122

Lazorenko, S. (2021). Theory and practice of forming the information and digital culture of future specialists in physical culture and sports in conditions *of mixed education. Education. Innovation*. Practice, 9(2), 38-47. https://doi.org/10.31110/2616-650X-vol9i2-005

Lishchynska, L. B. (2017). *The use of innovative and traditional learning technologies in higher education institutions in the conditions of informatization of education. Distance learning as a modern educational technology: materials of the inter-university webinar (Vinnytsia, March 31, 2017)*, Vinnytsia: Vtei Knteu, 59-59.

Mazur, K. (2022). Organization of physical education during distance education in institutions of higher education. *Collection of Scientific Papers* "SCIENTIA", (December 2, 2022; Helsinki, Finland), 147-149. https://previous.scientia.report/index.php/archive/article/view/608

Nekrasov, H., Pysanets , I., Zhosan, T., Samsutina, N., & Voloshchuk, K. (2023). Theoretical and methodological aspects of the formation of research competence of future teachers of physical education in the process of professional training. *Revista Eduweb*, 17(1), 122-130. https://doi.org/10.46502/issn.1856-7576/2023.17.01.12

Plakhotnik, O., Zlatnikov, V., Strazhnikova, I., Bidyuk, N., Shkodyn, A., & Kuchai, O. (2023). Use of information technologies for quality training of future specialists. *Amazonia Investiga,* 12(65), 49-58. https://doi.org/10.34069/AI/2023.65.05.5

Samokhvalova, I. Yu., & Kharchenko, S. M. (2022). Use of fitness programs in physical education of female students of higher education institutions during distance education. *Rehabilitation and Recreation*, 11, 157-162. https://doi.org/10.32782/2522-1795.2022.11.18

Shor, R. M. (2011). Cloud computing for learning and performance professionals. *American Society for Training and Development,* 28(1104).

Sokoliuk, O. (2013). Determining the readiness of future specialists in physical education to perform distance education. *Modern Information Technologies and Innovation Methodologies of Education in Professional Training: Methodology, Theory, Experience, Problems*, (35), 450–455. https://vspu.net/sit/index.php/sit/article/view/3336

Stefanenko, P. V. (2002). *Theoretical and methodical principles of distance learning in higher education* (thesis... of the doctor of pedagogy sciences) Institute of Pedagogy and Psychology of Vocational Education of the

National Academy of Sciences of Ukraine, Kyiv, 492.

Terentieva, N. (2019). Peculiarities of distance education for masters of the faculties of physical culture. *Information technologies and teaching aids,* 1(69),139-147.

Tsybulko, L. H., & Hloba, H. V. (2021). Peculiarities of distance learning of students of the Faculty of Physical Education in quarantine conditions. *Bulletin of Luhansk National University named after Taras Shevchenko: Pedagogical Sciences*, 6(344), Part 2, 84-97. https://doi.org/10.12958/2227-2844-2021-6(344)-2-84-97