

DOI: <https://doi.org/10.34069/AI/2023.72.12.15>

How to Cite:

Dzhurynskiy, P., Broiakovskyi, O., Tsviakh, O., Koshliak, M., Turchak, A., & Zalizniak, A. (2023). Innovative dimension of effectiveness in physical education student learning. *Amazonia Investiga*, 12(72), 167-179. <https://doi.org/10.34069/AI/2023.72.12.15>



Innovative dimension of effectiveness in physical education student learning

Інноваційний вимір ефективності навчання студентів фізкультурного напрямку

Received: October 25, 2023

Accepted: December 26, 2023

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Abstract


The article elucidates the basics of effectiveness in physical education student learning using innovative technologies aimed at realizing the intended goals and objectives, improving the educational level of those seeking education – improving educational services and the quality of education; the reasons for the need to introduce innovative technologies are determined; essential signs of innovation are shown; we will single out the integral qualities that characterize innovation; modification and combinatorial innovations are considered. The purpose of the article is to find out the basics of effectiveness in physical education student learning using innovative technologies aimed at realizing the set goals and objectives, increasing the educational


Анотація


У статті висвітлено основи ефективності навчання студентів фізичної культури з використанням інноваційних технологій, спрямованих на реалізацію поставлених цілей і завдань, підвищення освітнього рівня здобувачів освіти – підвищення освітніх послуг та якості освіти; визначено причини необхідності впровадження інноваційних технологій; виявляються істотні ознаки інноваційності; виділено інтегральні якості, що характеризують інноваційність; розглянуто модифікаційні та комбінаторні новотвори. Мета статті – з'ясувати основи ефективності навчання студентів фізичної культури з використанням інноваційних технологій, спрямованих на реалізацію поставлених цілей і


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level of education seekers – and improving educational services and the quality of education. The methodology concept offers fundamental ideas for effectiveness in physical education student learning. The main tasks of effectiveness in physical education student learning are revealed and the algorithm for the effectiveness of the education process is shown; we will highlight the requirements necessary for high-quality professional training; effective forms of introducing digital competence, innovative teaching methods, and technologies into the educational process are grouped.

Keywords: professional training, physical education student learning, innovative technologies, improvement of the educational level of education seekers, quality of education.

Introduction

The requirement to transition to innovative education, in particular in higher education, is determined by today's challenges and belongs to the priority areas of state policy in Ukraine in the context of the integration of the educational sector into the European space. Currently, higher educational institutions face the task of improving the quality of education, developing and implementing information technologies, and creating conditions for training specialists at a high professional level (Telekalo, 2018).

The use of innovative technological means logic in the educational process is aimed at improving the professional training of students. In such a way, in modern conditions of global transformations, the educational environment is of particular importance to improve professional training based on the practice development of innovative learning technologies, this is and future physical education teachers (Telekalo, 2018).

Therefore, the modernization of physical education is conditioned by the need to overcome a problematic situation in which two contradictions are evident: between the requirements of social practice for the implementation of the already created values of physical culture and sports and the need to create new types of physical culture and sports activities; between the information-productive (passive) nature of education and the need to introduce new forms, methods, and means of physical education.

In our opinion, the physical education of students deserves special attention, because the years

завдань, підвищення освітнього рівня здобувачів освіти – покращення освітніх послуг та якості освіти. Концепція методики пропонує фундаментальні ідеї щодо ефективності навчання студентів фізичного виховання. Розкрито основні завдання ефективності навчання студентів з фізичного виховання та наведено алгоритм ефективності навчального процесу; виділимо вимоги, необхідні для якісної професійної підготовки; згруповано ефективні форми впровадження в навчальний процес цифрової компетентності, інноваційних методів і технологій навчання.

Ключові слова: професійна підготовка, фізичне виховання студентів, інноваційні технології, удосконалення освітнього рівня здобувачів освіти, якість освіти.

spent at a university are an important stage in the formation of future specialists. It is no accident that in the complex system of the educational process in higher education institutions, sufficient attention is paid to the physical education of students. The physical culture of students is of great importance for the professional training of future specialists.

To determine the effectiveness of physical education student learning, we considered in the article: reasons for innovative pedagogical activity in a higher educational institution; directions for the use of innovative educational technologies in the higher education system in the professional training of future physical culture and sports specialists using innovative technologies; the task of effectiveness in physical education student learning in the modern innovative society; requirements necessary for high-quality effectiveness in physical education student learning; algorithm of the process of organizing physical education student learning in the modern innovative society; group of innovative educational technologies to use of innovative technologies that improves the quality of education; types of electronic educational resources for effectiveness in physical education student learning.

Literature review

The analysis of the latest researches and publications shows that the consideration of the requirements for professional training of the effectiveness in physical education student learning in the conditions of informatization of education, as well as the problems of improving

the training of teachers for the use of information technologies in pedagogical activity, is devoted to the research of many authors. O. Bezakopylnyi (2020) characterized the possibilities of forming the readiness of future physical culture and sports specialists to work in primary school; developed ways and experimentally tested the effectiveness of training future specialists in physical culture and sports using innovative technologies; revealed the indicators, criteria, and levels of readiness of future specialists for health care activities; proposed a model and developed a concept of a training system for effectiveness in physical education student learning for health-preserving activities in primary schools; characterized the specifics of training future physical culture and sports specialists in higher education institutions in Germany; the Netherlands; Poland; theoretically substantiated the identified pedagogical conditions for the training of specialists and analyzed the main methodological approaches to the training of future specialists in physical culture for work in primary schools.

According to research by scientists O. Bida, O. Shevchenko, O. Syroiezhko, K. Shovsh, & V. Vizaver (2023) occupies a special place in the level of physical fitness, physical development of a person, and the constantly deteriorating state of health of students, they developed ways of quality training of physical culture and sports specialists and showed the advantages of organizing sports events at school when organizing group interaction of students in team sports (implementing intellectual education of participants in the educational process). The main ways of organizing group interaction of physical culture and sports specialists in team sports and preparing them for organizing sports events at school have been clarified. The functions of sports referees, competition organizers, physical culture and sports specialists, and their group interaction in team sports were clarified, and the importance of sports competitions, which contribute, if they are held regularly, to the growth of sports results.

At the same time, taking into account the significant number of scientific works, innovative teaching technologies have not yet gained mass application in the professional training of future teachers of physical culture. In the field of physical culture and sports, the passive form of organization of student education still prevails. While preserving the existing academic traditions, it is necessary to bring and adapt new, innovative ones that will be able to improve the existing state in this field. In the

theory and practice of team building, V. Horbunova (2014) revealed the value-role approach, within which several value-role team-building technologies were presented and the author's value-role concept of team development and formation was developed. In the value-role approach, paradigmatic boundaries are revealed, which are represented by role theories of personality and subject-oriented theories, in which a unique value consciousness is formed and the uniqueness and striving for role self-realization of each person is analyzed.

S. Smoliuk (2022), to train a future specialist in a higher education institution, theoretically substantiated the possibilities and presented the ways of using innovative pedagogical technologies in the learning process. The essence of the conceptual apparatus "innovative pedagogical technology" is revealed, and the author's definition of the concept is presented, which is interpreted as an ordered set of operations, actions, and procedures, to ensure the achievement of the diagnosed and predicted result under the condition of constant improvement and positive changes in the educational process.

According to the studies of scientists, a special place is occupied in the formation of the knowledge and qualities that a future specialist in physical education should possess. This is explained by the fact that it is impossible to build a sports career (be it a teacher of physical education in a general educational institution or a professional athlete) without having the basic abilities and experience that are necessary to realize the optimal conditions of this profession.

V. Pavlenko et al., (2020) outlined in any sport the main directions of the organization of the process of training activities aimed at mastering the skills, professional and pedagogical knowledge, and skills that are necessary for the training of qualified athletes in the work of a coach-teacher. To form a professional worldview, the data used in the chosen sport in the process of studying and analyzing innovative training technologies are systematized.

In turn, scientists from Latin American countries consider the problem of the effectiveness of teaching physical education students and draw attention to the importance of innovative technologies in the training of physical education students at universities.

According to the scientists of Latin American countries, attention is focused on the need to use

innovative technologies in the entire educational process, which will make it possible to form a highly information culture of the world's youth. The formation of innovative technologies in the training of physical education students requires, first of all, a high level of the teacher's information culture and methodical literacy in the training of physical education students.

In particular, V. Padrón, & Y. Palacios (2022) emphasize that the study is based on a diagnosis test that confirmed the problems during the teaching-learning process of Physical Education and on the use of empirical methods such as scientific observation, survey, and documentary review. V. Fiuza, I. Nascimento, A. Torres, P. Soares & H. Ferreira (2023) in their following work the objective to analyze, in basic education student's perception, which tools and digital resources implemented in Physical Education classes were most favorable and significant for their learning.

At work, V. Quilindo (2023) revealed teachers' conceptions about physical education. It was found that the physical education class mediated by ICT requires configuring the contents according to the needs of the health emergency context, that there are strengths in the digital tools for the teaching-learning process, as well as weaknesses of the teachers in their management, it is evident that there are students with accessibility and limitation for the connection, which affects the monitoring of progress both in synchronous and asynchronous phases.

The problem of the formation of professional skills of physical culture specialists is constantly in the field of view of special research institutions, scientific teams, and individual researchers, only in recent years, have several scientific and practical conferences devoted exclusively to this problem been held in Ukraine, or this issue was discussed along with other areas of scientific research. However, the analysis of the main directions of introducing innovations into the process of effectiveness in physical education student learning as a pedagogical problem remains an unresolved part of this rather urgent issue.

The analysis and discussion of the problems of effectiveness in physical education student learning speak of the need to introduce innovative technologies in a personal and professional context. This emphasizes the importance of realizing the contradictions between the rapid growth of the knowledge of education seekers in the modern innovative

society and the limited possibilities of their application due to insufficient use of the personal resource of their assimilation by future specialists; the need to train a competent specialist in physical culture by the requirements of modern reformation processes and the imperfection of technologies for the formation of effectiveness in physical education student learning using innovative technologies.

In connection with the above, the need to develop theoretical and methodological principles in creating an effective system of effectiveness in physical education student learning using innovative technologies in the process of training a competent specialist becomes of great importance.

Purpose: to find out the basics of effectiveness in physical education student learning using innovative technologies, aimed at realizing the intended goals and objectives, improving the educational level of education seekers – improving educational services and the quality of education.

Methodology

The methodological concept offers fundamental ideas for the effectiveness of physical education student learning using innovative technologies.

The methodological concept provides for the provision of effectiveness in physical education student learning with a complex of didactic and methodical support (diagnostic, educational and methodological, monitoring, technological), aimed at the realization of the intended goals and objectives, improvement of the educational level of those seeking education, the selection of forms and methods that were aimed at implementing and ensuring the process of improving educational services and the quality of education. For the research, we used qualitative methods of research, which are non-standardized and were aimed at personal expectations, identifying aspects of the motivational behavior of respondents, their values, and ideas. Qualitative research was focused on the disclosure of cause-and-effect relationships and aimed at studying a wide range of manifestations of the object. This allowed the respondents to express themselves freely and contribute to the disclosure of their experiences and inner values, stimulating their creative potential.

Achieving the set goal and checking assumptions is ensured by research methods:

- analysis and generalization of psychological-pedagogical, philosophical, educational-methodical, sociological literature, dictionary publications, scientific articles, and papers, dissertation works to reveal the essence, clarifying the state of development of the problem, choosing conceptual ideas that are methodical and theoretical-methodological the basis for the introduction and development in the educational process of a system of effectiveness in physical education student learning using innovative technologies aimed at realizing the intended goals, tasks, and improving the educational level of education seekers;
- modeling, and synthesis, which provided an opportunity to systematize and generalize information about the object of research, to form a terminological apparatus, and to develop a system of effectiveness in physical education student learning using innovative technologies aimed at improving the educational level of education seekers.

The study of the methodological process, to ensure reproducibility, included the following steps:

- converting or transcribing recorded data into text, which was the first stage of qualitative data assessment;
- to reveal the patterns of professional training of future specialists in physical education and sports effectiveness in physical education student learning using innovative technologies, topics, and categories, data coding was used, which assumes that the student of education reads and rereads the data, to improve this process, using software;
- formation by the student of topics and subtopics that emerge from the data after they have been coded.
- depending on the collected data, at the last stage, the student evaluated topics and subtopics, made suggestions, and drew conclusions.

The study proved the validity of the theory of effectiveness in physical education student learning using innovative technologies, that is, its plausibility was substantiated. We consider the measurement to be valid because, with its help, the concepts and properties that are planned for measurement were recorded.

The scope of validity is between the tool and theory, and the scope of reliability is between

reality and the tool. In our case, measurement and research appear as equal concepts, as measurement is embedded in the theory.

When determining the sample of subjects, the general specificity of the subject of the study was taken into account. The total sample size is 96 subjects, among whom are students of physical education. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

During the experiment, the target, substantive, and procedural components of the effectiveness of teaching physical education students were implemented.

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

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

At the main stage, an 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, and the objectivity of their assessment were ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating 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 experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

Results and discussion

Innovations in education are dynamic in nature and developmental in results, a natural phenomenon. Their introduction into the educational process allows us to resolve the contradictions between the need for qualitatively

new education and the traditional system (Borova et al., 2021).

"Innovations in education is the process of creation, introduction, and dissemination in educational practice of new ideas, tools, pedagogical and management technologies, as a result of which indicators (levels) of achievements of structural components of education increase, the system transitions to a qualitatively different state" (Dubaseniuk et al., 2009).

Translated from Latin, the concept of "innovation" means "updating, changing, introducing" (Telekalo, 2018).

Reasons for innovative pedagogical activity in a higher educational institution.

In the modern conditions of the development of culture, society, and education, there is a need for innovative pedagogical activities and digital competence in the institution of higher education, which is determined by several reasons.

1. Socio-economic transformations necessitate a significant renewal of the higher education system. The innovative orientation of the activities of teachers of higher education institutions includes the development, creation, and use of pedagogical innovations to update educational policy.
2. Strengthening the humanization of the content of higher education, continuous changes in the composition and scope of educational disciplines, and the introduction of new educational subjects, all require a constant search for innovative learning technologies and new organizational forms in education.
3. Changing the role of the teacher himself to the initiator of innovations from just a person who uses the recommended innovations (Telekalo, 2018).

An essential feature of innovation is the expansion of the innovative field of the educational environment in the institution of higher education, and the ability to influence the general level of the teacher's professional activity (Puhach et al., 2021).

Let's distinguish the integral qualities that characterize innovation: innovative activity, innovative process, innovative environment, and innovative potential. The introduction of innovations into the educational process of a higher education institution for high-quality

training of a specialist forms between the subjects of the educational process and a high-quality level of cultural relations, in the educational environment contributes to the improvement of the microclimate. Innovations contribute to overcoming the stereotypes of a conservative management style, ensure the introduction of modern forms and methods of management, and form new partnerships.

The spread of system-methodological level innovations in the professional training of future specialists in physical education and sports are introduced within the framework of the general system.

The local-technological level of innovation involves the approbation of a high-quality educational system in the effectiveness of physical education student learning using innovative technologies, aimed at the implementation of improving the educational level of education seekers, intended tasks, and goals, improving the quality of education and educational services of personally oriented digital competence and innovative systems and methods.

Innovations in education are introduced based on radically new means (neuro-linguistic programming, information, computer technologies, etc.).

Innovations aimed at improving the methods, forms, and content of the educational process, and the organization of education are modifications.

Modern innovations – educational and pedagogical, adapted to the socio-cultural new environment are called – combinatorial (Kuchai, 2013).

Directions for the use of innovative educational technologies in the higher education system in the effectiveness of physical education student learning using innovative technologies.

The use of innovative educational technologies, and digital competence is considered in the system of higher education in effectiveness in physical education student learning using innovative technologies in the following areas:

- the content of education – the formation of national educational concepts, the development of new state standards of higher education, the creation of original

curricula and programs for the professional training of future physical culture specialists, the development of a new quality assessment system for the training of future physical culture specialists;

- methods, forms, and technologies of the educational process of effectiveness in physical education student learning – the priority of dialogue methods of training and education; the emergence of distance learning; introduction of innovative technologies, etc.;
- education management system – introduction of consultative and prognostic modernized management functions of the head.

In the process of physical education student learning in the modern innovative society, the formation of professional competence is of significant importance, "the ability of a teacher to solve the tasks of professional activity based on professional knowledge and skills, integrated with the development of personal professionally significant qualities, is one of the leading who have a love for the younger generation combined with demandingness, empathy, and communication".

Professional training of future specialists in physical culture and sports in the modern innovative society is the ability of a specialist to implement his knowledge in practice; is the result of a complex educational process, is based on a general outlook and a high general culture of the individual, professional knowledge of theory, methodology, psychology, pedagogy, scientific foundations of management; this is the ability to apply the entire complex of managerial and pedagogical skills, innovative and traditional methods of social, psychological and pedagogical research.

In the modern innovative society, an integral component of the professional training of specialists is the formation of professional qualities, which act as the most important factor of professional suitability and briefly characterize certain abilities and are organically included in their structure, developing in the process of practical activity and training.

The main task that is solved in the process of professional training is self-awareness as a person and respect for another person as a social value, development of professional interests of future specialists, and professional self-awareness.

Tasks of effectiveness in physical education student learning in the modern innovative society.

The professional training of future physical culture and sports specialists in the modern innovative society is considered by scientists as a multifactorial structure, the important tasks of which are:

- formation of professional skills;
- acquiring the meaning of pedagogical activity;
- education of personal qualities necessary for future work;
- acquisition of professional competencies by each student of education.

The professional training of future physical culture specialists in the modern innovative society includes in its content a system of pedagogical and organizational measures that should ensure the formation of a person's system of knowledge, professional orientation, abilities, skills, and professional readiness, which is defined as the subjective state of a person, who considers herself prepared and capable of performing the intended professional activity and strives to perform it (Hurniak, 2018).

The application of competency-based, integrative, activity-oriented, personally oriented approaches in the effectiveness of physical education student learning, by the requirements of employers, will ensure a high level of training of a competitive, creative, personality of the future specialist (Anishchuk, 2020).

Requirements necessary for effectiveness in physical education student learning using innovative technologies.

We will single out the following requirements that are necessary for effectiveness in physical education student learning using innovative technologies:

- 1) creation of an emotionally stimulating educational environment, providing students with an initiative in educational and cognitive activities, development of future physical culture specialists in freedom and self-regulation, rooted in awareness and a sense of personal responsibility;
- 2) solving educational tasks in an atmosphere of emotional community and interaction;
- 3) performance of the role of a consultant by a teacher who creates opportunities for self-realization and the choice of cognitive

alternatives for those seeking education (Dubaseniuk et al., 2009).

The conducted study shows that the majority of education seekers say that the educational process of higher education institutions is insufficiently prepared for the use of innovative technologies in professional activities (63%), and only 7% of respondents say that they are well prepared for this type of activity, and moderately prepared – 30%. The reasons for such a low state of professional training are the lack of theoretical training specifically for the use of innovative technologies in the educational process (28%), practical experience of using innovative technologies (42%), methodological training (20%), educational and methodological support (10%) (Borova et al., 2021).

Effective forms of introducing digital competence, innovative teaching methods, and technologies into the educational process and, based on them, the formation of key professional competencies of future physical culture specialists, are the use of modern information and interactive technologies, video and audio tools, electronic educational complexes that contribute to the development of education seekers, provide individualization education, as well as serve the personal orientation of students, that is, there is a transition to innovative and active learning from explanatory and illustrative.

Algorithm of the Process of organizing the professional training of future specialists in the modern innovative society.

The process of organizing the professional training of future specialists in the modern innovative society will be effective according to the algorithm:

- 1) the introduction of information and communication technologies contributes to the formation of an understanding of the goals of the future specialist's activity, activation of cognitive activity, and positive motives;
- 2) possession of facts, acquisition of theoretical foundations, formation of a body of knowledge, interest in scientific issues;
- 3) focus on mastering future specialists the method of applying information and communication technologies, interactive learning methods during practical classes, independent work, and pedagogical practice;
- 4) use of test tasks to guide the amount of acquired knowledge, increase the reliability and objectivity of the quality of education;
- 5) orientation in various information programs, practical assimilation of knowledge, and application of information and communication technologies (Boliubash, 2012).

Innovative educational technologies have been defined as to use of innovative technologies that improve the quality of education.

Using digital competence and innovative technologies improves the quality of education. Let's name groups of innovative educational technologies:

- training technologies – focused on the actualization of accumulated theoretical knowledge, the conceptualization of practical experience of education seekers (modifications: analysis of specific situations, thematic and complex training, game technology);
- programmed learning – aimed at memorizing logically constructed and structured frames, which are accompanied by reinforcement and step-by-step control;
- multimedia technologies, where the functions of the teacher are performed by technical means of education (dynamic visualization of the content, provision of reference, informative, illustrative plan information, performance of test tasks, exercises, record keeping, etc.) (Smoliuk, 2022);
- integration technologies – such didactic systems created to ensure the integration of different types of activities, skills, and knowledge at the level of initial topics, integrated courses, educational problems, etc.;
- structural and logical technologies, which represent the organization of choosing a method of solving problems, step-by-step setting of didactic problems, diagnostics, and monitoring of the obtained results;
- computer technologies are implemented based on teacher-computer-learner interaction in didactic systems of computer education with the help of various educational programs (training, information, control, development, etc.);
- game technologies – a form of interaction between the teacher and students of education that contributes to the formation of the ability to solve tasks in the form of a didactic game through the implementation of a certain plot based on a competent choice of alternative options. Simulation exercises are used in the educational process;

- business, theatrical, computer games; role-playing, game design, etc.;
- dialogue technologies depend on the existence of a communicative environment, and contribute to the expansion of the space of cooperation at the subject-subject level: "teacher-author", "educator-teacher", "educator-author", etc. (Dychkivska, 2004).

Practicing teachers develop proprietary technologies that combine elements of proven technologies in various variants, which are oriented towards achieving the goal and implementing the content of multi-disciplinary and multi-level education (Kolesnyk, 2016).

These innovative technologies allow each teacher to find for his subject favorable means of activating the education of students (Bezcopylnyi, 2020).

Therefore, in an institution of higher education, professional training should take place in an environment that is specially created and in which future specialists independently develop the necessary business qualities, from the ability to independently master new knowledge, and acquire the necessary professional competencies in the course of future professional activity. Therefore, in the professional training of future specialists, it is necessary to shift the emphasis from the tasks of forming professional skills, abilities, and knowledge to the tasks of forming their professional competencies. Among professional competencies, the main ones are the ability for self-improvement, self-education, and self-development. Innovative technologies are an effective means of accomplishing this task (Smoliuk, 2022).

To increase the physical fitness of the individual, the level of physical development of the person, the state of health of the students of education, which is constantly deteriorating, it is necessary to carry out high-quality organization and preparation of sports events in educational institutions of all levels, to instill a love for sports, to organize group interaction of students of education in team sports. During sports competitions, tasks are improved to improve theoretical and physical training of the individual (Bida et al., 2023).

All types of human activity are represented in team sports during the group interaction of higher education students: value-oriented, cognitive, communication, etc., which actively shapes the behavior and consciousness of students in the right direction. In the process of such sports

events, there are two types of communication: mediated and direct, mental education of the participants is carried out (Bida & Shevchenko, 2018).

Innovativeness, informatization, and technology in the modern educational environment lead to solving the problem of health care for young people. The activity of physical culture specialists is of particular importance in this process (Bezcopylnyi, 2020).

The wide application of innovative educational technologies in the practice of a higher school can significantly improve the quality of professional training of physical culture specialists in all forms of organization of the educational process (Lytvynova, 2011).

Reducing the number of classroom hours, the need for active interaction between participants in the education process, the growing role of independent work of education seekers, a significant flow of information, the shortage of study time in the conditions of the rapid development of information and communication technologies requires the development of appropriate systems and forms of education, changes in the role of the teacher. This approach increases the significance of the virtual educational space and electronic educational resources in training future specialists in physical education and sports. Today, information and communication technologies are an important component of education. They significantly expand the possibilities of processing various information necessary to improve the quality of education, the ways of obtaining it, the efficiency of assimilation of software material, the ability for mobile learning, contribute to the development of cognitive abilities and the formation of professional competencies of future specialists (Bezcopylnyi, 2020).

An electronic educational resource, which is an important element of the educational process, is a means of processing, storing, and transmitting information, and contributes to the acquisition of systematized knowledge in the effectiveness of physical education student learning.

In the educational process, the use of information and communication technologies allows you to manipulate existing information, promotes creative learning to create a new "product", and does not duplicate the information received. In this regard, we are talking about the need to "ensure meaningful and informative filling of the educational space with the necessary electronic

resources, such as electronic books, libraries, educational portals, distance educational services, etc." (Konevshchynska, 2014).

Describing the various technologies and their advantages, the results are discussed in comparison with previous studies. In particular, the analysis of scientific research and regulatory documents confirms that the problem of improving the effectiveness of physical education student learning using innovative technologies has not received a systematic study in the world, as a result, there is no holistic justification of the theoretical and methodological foundations of effectiveness in physical education student learning using innovative technologies. Therefore, in our study, we identified the reasons that make it necessary to introduce innovative technologies; essential signs of innovation are shown; we will single out the integral qualities that characterize innovation; modification and combinatorial innovations are considered. Areas contributing to the use of innovative educational technologies in the system of higher education in the professional training of future specialists in physical education and sports using innovative technologies are named.

To determine the entry level of the use of innovative educational technologies in the system of higher education in the professional training of future specialists in physical culture and sports, during the pedagogical experiment, at the ascertaining stage, indicators of the levels of development of digital competence of future specialists in physical culture and sports were determined, according to the components that will be used in the future for the organization the next stages of the experiment. Therefore, the accuracy and reliability of the results obtained at the ascertainment stage will influence the subsequent stages of the pedagogical experiment. 96 respondents were involved in the ascertainment stage of the experiment: numerically, the control group (CG) included 46 physical culture and sports specialists, and the experimental group (EG) – 50 people, respectively.

To ensure the reliability of the results of the pedagogical experiment, the creation of CG and EG was based on the principles of homogeneity of quantitative and qualitative indicators of respondents in groups and the identity of samples.

Investigating the development of the motivational and value component of the digital

competence of future physical culture and sports specialists at this stage of the experiment, we observe: a high level of development in the CG of the digital competence of future physical culture and sports specialists is 14.9%, and in the EG – 15.4%, which is on average is 15.1% of respondents. A significant number of respondents, 38.5% in CG and 39.4% in EG, on average 39%, have an average level. The obtained results also showed that 46.6% of the CG and 45.2% of the respondents in the EG have a low level of development of the motivational and value components, respectively (45.9% on average), which is almost half of all respondents. During the study of the motivational-value component, we can claim that the difference in the number of teachers assigned to different levels of development of the cognitive-educational component is a small percentage (0.4-1.4%), which also proves the homogeneous nature of the groups. Therefore, the analysis of the results gives reason to state that at a high level of development of the cognitive-learning component, the number of respondents in the CG is 7.2%, and in the EG – 6.8%, which is an average of 7%.

At the average level of development of the cognitive-educational component of the digital competence of future specialists in physical culture and sports, 45.2% were in the CG, and 44.2% in the EG, which is an average of 44.7% of the respondents. At the same time, at a low level of development of the cognitive-educational component of the phenomenon under study, CG – 47.6%, EG – 49%, and the average value – 48.3%. We take into account the average percentages since this trend is observed both in the control and in the experimental group.

The analysis of the experimental results at the ascertaining stage of the pedagogical experiment gives grounds for asserting that the cognitive-learning component of the digital competence of future physical culture and sports specialists is at a low and medium level of development, therefore the urgency of improving the educational process appears.

At this stage of the pedagogical experiment, the homogeneity of CG and EG was checked. We determined the reliability of the sample using the Student's t-test for independent samples (criterion of the reliability of differences in mean values).

Application of the Student's t-test made it possible to determine whether there are differences and how statistically significant they

are between the two data samples. And, accordingly, how well-argued the conclusions about these differences will be.

We proposed two hypotheses: null (H0) and alternative (H1). Bearing in mind the null hypothesis (H0), we assume that the distribution of respondents according to the level of development of digital competence in the control and experimental groups is the same, that is, the sampling was carried out correctly. Accordingly, in the alternative hypothesis (H1) we accept that the difference between CG and EG is significant. If $t_{\text{exp}} < t_{\text{kr.}}$, then the null hypothesis is accepted if $t_{\text{exp}} > t_{\text{kr.}}$, then the alternative hypothesis is accepted. Where $t_{\text{kr.}}$ – table value, t_{exp} is the result of mathematical data processing.

This gives reason to assert that in the process of conducting the pedagogical experiment, we observed all the necessary restrictions of the Student's t-test, which, in turn, ensures the reliability of the results of our research. The results obtained by us from the ascertaining stage of the pedagogical experiment formed the basis for the preparation and conduct of the next (formative) stage of the experiment.

We, having conducted an ascertaining experiment, found out the basics of professional training of future specialists in physical education and sports using innovative technologies aimed at realizing the intended goals and objectives, improving the educational level of those seeking an education – improving educational services and the quality of education; the reasons for the need to introduce innovative technologies are determined; essential signs of innovation are shown; we will single out the integral qualities that characterize innovation; modification and combinatorial innovations are considered. Areas contributing to the use of innovative educational technologies in the system of higher education in the professional training of future specialists in physical education and sports using innovative technologies are named; the main tasks of the professional training of future specialists in physical culture and sports in the modern innovative society are named and the algorithm of the effectiveness of the educational process is shown; we will highlight the requirements necessary for high-quality professional training; effective forms of introducing innovative teaching methods and technologies into the educational process are grouped; the most important groups of innovative educational technologies and types of electronic educational resources for the training of future physical

culture and sports specialists are given and their advantages are shown; the importance of digital competence, blended learning technologies and the importance of cloud technologies have been proven.

At the formative stage of the experiment, respondents who were improving their qualifications according to an established educational program without special courses developed by us entered the CG. The EG was completed by respondents who took advanced training courses and mastered the special course "Digital competence as a factor in improving the specialist's professional skills".

The analysis of the results shows a significant decrease in the number of respondents with a low level of development of the studied component to 4.3% of EG respondents against 38.5% in CG, and 67.3% of EG respondents reached the average level of the operational component. In comparison, in CG their number is equal to 50.9% of people.

We assume that the level of development of the components of digital competence of future physical culture and sports specialists increased due to the formative stage of the pedagogical experiment, and not by chance. For evidentiary testing of our assumption, we put forward null (H0) and alternative (H1) hypotheses.

The tabular value of the Student's t-criterion is 1.98. For each of the components of the digital competence of future physical culture and sports specialists, we obtained indicators that are higher than the tabular value, which reflects significant deviations in the levels of development of the components of the digital competence of teachers in the studied groups, and, accordingly, the alternative hypothesis (H1) will be true. So, we proved the effectiveness of the conducted formative measures of the pedagogical experiment in the experimental group.

Conclusions

The basics of effectiveness in physical education student learning using innovative technologies aimed at realizing the intended goals and objectives, improving the educational level of those seeking an education – improving educational services and the quality of education; the reasons for the need to introduce innovative technologies are determined; essential signs of innovation are shown; we will single out the integral qualities that characterize innovation; modification and combinatorial innovations are

considered. Areas contributing to the use of innovative educational technologies in the system of higher education in the professional training of future specialists in physical education and sports using innovative technologies are named.

In the article, we considered the reasons for innovative pedagogical activity in a higher educational institution; showed directions for the use of innovative educational technologies in the higher education system in the professional training of future physical culture specialists using innovative technologies; showed the tasks of effectiveness in physical education student learning in the modern innovative society; highlighted the requirements necessary for high-quality professional training of future physical culture specialists using innovative technologies; determined the algorithm of the Process of organizing the professional training of future specialists in the modern innovative society; groups of innovative educational technologies have been defined to Use innovative technologies that improve the quality of education; types of electronic educational resources for the training of future specialists in physical education and sports are outlined. The effectiveness of the process of organizing the professional training of future specialists in the modern innovative society is shown by the algorithm. Groups of innovative educational technologies are given. The most important types of electronic educational resources for the effectiveness in physical education student learning are highlighted and their advantages are shown.

Further research requires a detailed consideration of cloud technologies, regarding their importance for the training of future specialists.

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