

## REVIEW ARTICLE

# INTRODUCTION OF INNOVATIVE TECHNOLOGIES IN EDUCATIONAL PROCESS OF FUTURE SPECIALISTS IN PHYSICAL THERAPY AND ERGO THERAPY

DOI: 10.36740/WLek202206128

**Anna V. Fastivets<sup>1</sup>, Anatoliy V. Emetc<sup>2</sup>, Yevheniia O. Skrinnik<sup>2</sup>, Oleksandr V. Petryshyn<sup>2</sup>**<sup>1</sup>POLTAVA INSTITUTE OF BUSINESS PHEE «ISTU», POLTAVA, UKRAINE<sup>2</sup>POLTAVA STATE MEDICAL UNIVERSITY, POLTAVA, UKRAINE

## ABSTRACT

**The aim:** Is scientific substantiation of introduction of innovative technologies in the process of training future specialists in physical therapy and ergo therapy (occupational therapy).

**Materials and methods:** We used following set of theoretical research methods: analysis and synthesis of scientific and scientific-methodical literature, which made it possible to identify existing contradictions, to formulate the specifics of the introduction of innovative technologies in the process of training of future specialists in physical therapy and occupational therapy and to find possible ways of its improvement. We also used generalization and systematization of research data, which allowed to form the theoretical and methodological basis of the study. We performed a synthesis of scientific theories, approaches and concepts to identify favorable conditions for the formation of future specialists in physical therapy and occupational therapy. Among empirical methods we used observations and surveys.

**Conclusions:** Our research shows that the use of such interconnected innovative pedagogical technologies as: technologies of personal and professional development, technology of full acquisition of knowledge, information and communication technologies, exploratory research technologies and technologies of contextual education contributes to the effective implementation of the educational process of training specialists in physical therapy and occupational therapy in a medical school.

**KEY WORDS:** physical therapist, ergo therapist, innovative technologies, training system for physical therapists and ergo therapists, pedagogical process, medical students

Wiad Lek. 2022;75(6):1578-1582

## INTRODUCTION

At the beginning of the XXI century traditional forms and methods of teaching in institutions of higher medical education do not allow students to achieve a holistic understanding of the inner essence of processes and phenomena, own reserves of self-development and the appropriate level of readiness for future professional activity. At the same time, research convinces of the expediency of using the interactive organization of the educational process in the training of specialists in physical therapy and ergotherapy (occupational therapy). The development of creative thinking of medical students requires measures that provide personal and professional development and self-development, originality, flexibility and productivity of thinking, professional mobility. This encourages the use of a technological approach in the training of future professionals, which ensures the transformation of the educational process in the educational institution into purposeful activities of all its subjects and ensures its integrity, personal and socio-economic significance.

## THE AIM

The purpose of the study is to substantiate the introduction of innovative technologies in educational process of future specialists in physical therapy and occupational therapy.

## MATERIALS AND METHODS

To achieve this goal, we used a set of research methods, in particular, theoretical, such as: analysis and synthesis of scientific and scientific-methodical literature, which allowed us to identify existing contradictions, to formulate the specifics of the introduction of innovative technologies in the training of future specialists in physical therapy and occupational therapy. This also allowed us to find possible ways to improve. The generalization and systematization of research data allowed us to form the theoretical and methodological basis of the study. Synthesis of scientific theories, approaches and concepts provided us the ability to identify favorable conditions for the formation of future specialists in physical therapy and occupational therapy. We also used empirical methods of research such as observations and surveys.

## REVIEW AND DISCUSSION

The training of specialists in physical therapy and occupational therapy can be qualitatively improved if following conditions are met: the center of the educational system is the student's personality, his educational and cognitive activities, individual psychological mechanisms of knowledge acquisition, the formation of intellectual and professionally important qualities; management of the edu-

educational process is based on continuous diagnostic control over the level of social and professional development and self-development of students and continuous monitoring of their achievements; individual and typological features of each student, individual subjective experience, ability to constructive interpersonal relations are taken into account; in the educational process the basic didactic, organizational-methodical, psychological and technological provisions, requirements of learning patterns, didactic principles and principles of education are followed [1; 2].

In the practice of higher medical education institutions, the technologies of personal and professional development of students are becoming increasingly important. Since an important aspect of the educational process of training a future specialist is the harmonious development of all his talents, we consider elements of developmental learning technology to be effective for students. Their use activates the inner strengths of medical students (their needs, motives, cognitive abilities), which contribute to the self-development of professionally significant personal qualities and the formation of professional skills based on acquired knowledge. Developmental learning is a focus on human potential and their implementation in the educational process.

The most common are interactive technologies that provide training based on the psychology of human relationships and interactions and on dialogue between teachers and students. This dialogue forms and supports joint educational activity, in which the development of the subjects, involved in it, takes place. The communicative space of the lesson requires the establishment of mutual understanding between teacher and students on the basis of humanistic values and tolerance. The set of all the characteristics by which this communicative space is built is called educational discourse. The aim is to create comfortable learning conditions in which the student feels his success, his own intellectual ability, which makes the learning process more productive [3].

One of the most effective and widespread technologies of the organization of active cognitive activity of students, which helps with developing ability for the analysis of real, unsmoothed, unrefined vital and industrial tasks is the analysis of concrete situations. (*case-study*). When studying a specific situation, the student must determine the following: whether there is a problem, what it is and he must determine their attitude to the situation [4]. This technology teaches students to ask questions, distinguish facts from conjectures, identify important and secondary circumstances, analyze and justify their actions and decisions. Situations and cases serve as concrete examples for ideas and generalizations, provide a basis for a high level of abstraction and thinking, demonstrate feelings and emotions, interest students, help to connect learning with real life experience and show the perspective of applying knowledge in medical practice.

In general, interactive technologies allow future specialists in physical therapy and occupational therapy to achieve following: make knowledge acquisition and skills

development more accessible; learn to formulate your own opinion, express it correctly, argue and discuss, defend your position or point of view; learn to listen to others, respect alternative opinions or opposite position; to model different social and professional situations, to enrich own social and production experience through inclusion in various life circumstances and their knowledge; learn to build constructive relationships, determine your place in the group, avoid conflicts or resolve them, find compromises, seek dialogue, etc. [5].

Consider in more detail simulation-game learning technologies (situational modeling), which involve learning through simulation games. The specificity of this technology is to model in the learning process of different types of relationships, situations and circumstances of real life. Imitation and game technologies are designed to implement, in addition to the main didactic purpose, a set of additional tasks, for instance: providing control over the output of emotions; giving a person the opportunity for self-determination; inspiration and help to develop the creative imagination; providing opportunities for the development of skills of cooperation in the social aspect; giving the opportunity to express their opinions [6]. Direct emotional involvement in the situation, competitiveness and collectivism in search of better solutions, the possibility of a wide range of situations, mastering new techniques in medicine, business communication, training intuition and imagination, development of improvisational abilities and ability to respond quickly to changing circumstances made educational games quite popular.

Improving the level of professional competence of future professionals contributes to the use of training technologies that can be effectively used to teach medical students methods and techniques of practical work. Training technologies are a model of joint pedagogical activity of a teacher and students in designing, organizing and conducting the educational process with the obligatory creation of a favorable learning environment [7, 8].

One of the problems in the training process is to take into account the manifestation of role positions in the group. The very situation of the training requires flexibility in the behavior of its participants, which means abandoning the template and accepting new, non-standard game roles. One of the tasks of the training of motivation for professional activity is to expand the repertoire of roles, which allows students to function in reality on the basis of tested and consciously chosen roles in the training.

Among the various exercises and techniques of training work, the basic methods of training to motivate the professional activities of future professionals are group discussion and game technology [9]. Group discussion during training is a joint discussion of a controversial issue that allows you to clarify or change the opinion, position and attitude of group members in the process of direct communication. In the training of motivation formation group discussion is used both to enable students to see the problem from different angles, and for group reflection through the analysis of individual experiences.

Technologies of full mastering of knowledge provide ensuring the possibility for students to choose the optimal learning conditions for them in order to achieve maximum results, namely full mastery of the required number of competencies. In practice, this means developing options for achieving the desired learning outcomes for students with different abilities by changing the learning parameters (time, place, method of presenting information), optimally selected for each student [10].

Within this concept, the taxonomy of B. Bloom's goals, used as a scale to measure learning outcomes, has become widespread abroad. Based on the research of American psychologists, as well as V. Bezpalko, the technology of criterion-oriented learning was developed, which is also called the technology of full assimilation, because it is based on the thesis that each individual is able to assimilate certain educational material, however, the amount of time required for this is different, as it corresponds to individual abilities and capabilities.

In the institution of higher medical education, the technology of full acquisition of knowledge is reflected in the individualization of the educational process. Individualized learning is an organization of mastering knowledge, skills, abilities, which allows each student to study according to an individual schedule (plan and programs adapted to it) and at an individual pace. This allows you to choose the optimal difficulty and complexity of educational material, to organize the acquisition of certain knowledge in a much shorter time than planned or, conversely, to extend it, meaning to create optimal conditions for learning in the area of immediate development [11].

The strategic direction of reforming higher education is the active introduction of modern information and communication technologies in educational activities [12].

The general areas of application of information and communication technologies (ICT) are as follows:

In *technologies of educational activity* – training in the use of ICT tools; information and multimedia tools in the educational process; electronic educational resources and electronic educational and methodical complexes; distance learning; electronic library services; medical practice.

In *technologies of research work* – performing calculations, complex computational tasks, modeling; organization of interaction with Ukrainian and foreign colleagues with the help of Internet resources, video conferencing, webinars based on cloud computing and virtualization tools [13].

Research shows that in the training of future professionals the use of ICT opportunities should be carried out in various ways, for instance: independent search by students of information on the Internet, use of thematically selected multimedia, hypertext electronic educational resources from various disciplines, e-mail, work with electronic directories, databases, library catalogs, creation and demonstration of own creative products (developments, presentations, abstracts), etc. [14].

Computer-based learning technologies are aimed at individual and individualized-group forms of learning.

New forms of teaching material with the help of interactive equipment allow combining visual, auditory and kinesthetic learning styles.

It is effective to use a computer to present educational information in the presentation of theoretical material. Modern ICT with the help of multimedia provides teachers of higher medical education with the means to demonstrate complex phenomena and processes and allow them to comprehensively illustrate the material with animation, photos, sound clips and video clips. Visual aids facilitate cognitive function, and the process of perception of educational material is significantly accelerated due to the combination of image and word.

In the future, the task is to create electronic educational and methodological complexes (EEMC), able to provide medical students with a full range of electronic educational resources for individual study of the discipline. This allows following: effectively manage the activities of independent study of the discipline; to stimulate educational and cognitive activities; to provide a rational combination of various types of educational and cognitive activities, taking into account the didactic capabilities of each of them in accordance with the level of learning material; rationally combine various technologies of presentation of educational material (text, graphics, audio, video, animation); use posted materials for virtual seminars, business games, work in projects, etc. [12; 13].

Today, the intensive development of the Internet and communication programs have opened up opportunities for real-time communication at a distance. The most widespread in the educational process is Skype, which allows for discussion and exchange of information (communications with the patient or consultations), send files, keep a notebook, receive news and hold Skype conferences, etc. This facilitates the organization of learning in its various forms, saving time and communicating in "live" format and allows you to quickly solve educational issues. Students work in different modes and communication is not limited to only with teachers [15].

The basis of the organization of educational research activities of future doctors are the ideas of problem-based learning. Initiation of independent search of knowledge by the student through problematization by the teacher of educational material assumes that knowledge is got in the course of the decision of problem situations and skills and abilities are formed by solving problems that do not have a defined answer. The main task of organizing such training is to find appropriate problem situations that have the appropriate level of complexity, motivate and provide the opportunity to acquire new knowledge by solving them at the level of accessible and interesting discoveries. The educational problem determines the direction of mental search, encourages the study of the unknown, which leads the student to learn a new concept or mode of action [16].

We see the essence of project technology in the functioning of a holistic system of support for independent activities of medical students and the organization of educational situations in which they pose and solve certain problems. This

involves systematic and consistent modeling of training solutions to problem situations that require search effort, aimed at research and development of optimal ways to solve them (creation of projects), their public protection and analysis of the results of implementation. Project technology requires each participant to become a subject of their own activity and to form competencies at each stage of design.

A *project* is an activity aimed at solving a specific problem, at achieving a pre-planned result. The problem of the project should be socially significant and include elements of reports, abstracts, research and any other types of independent creative work of students, but only as ways to achieve the result of the project. The teacher does not transfer knowledge, but directs the student's activities, meaning he supports independent work through following actions: counseling (provokes questions, reflections, self-assessment of activities, modeling different situations, transforming the educational environment) and motivation (reveals to students the situation of project activities as a situation of choice and freedom of self-determination) [17].

The technology of research work is associated with the formation of future specialists' knowledge, as well as the development of skills needed in research, which is one of the leading practical tasks of modern education. Mastering these important cognitive competencies is the key to the success of cognitive activity throughout life. We consider the ability to effectively use the relevant knowledge, as well as the developed skills and abilities to perform scientific research as the most important indicator of cognitive motivation and orientation.

Research knowledge should be understood as specific knowledge about conducting research and the operation of research search mechanisms. Under the general research skills and abilities in this context we understand following: ability to see problems; ability to ask questions; ability to make hypotheses; ability to define concepts; ability to classify; observation skills; skills and abilities to conduct experiments; ability to draw conclusions and inferences; skills of structuring the material [18].

Contextual learning involves the creation of an educational situation as close as possible to real life (especially professional). That is, proper preconditions are created for the transformation of educational activities into professional ones. At the same time, there is a natural increase in the share of students' practical activities with an emphasis on applied goals. The main task of contextual learning as a technology is to optimize teaching and learning based not only on the processes of perception or memorization, but primarily on creative, productive thinking, behavior and communication of students [19]. Contextual learning is organized in such a way that knowledge, skills and abilities are given not as a subject to which the activity of medical students is directed, but as a means of solving the problems of their activities as a doctor.

Introduction of educational material in the context of professional activity and "immersion" in it in the learning process increases the effectiveness of professional training of students, because this material and the process of its assimilation acquire

for him a personal meaning and significance. Mastering the norms of competent material actions, professional functions and relations of specialists during educational and professional individual and joint analysis and resolution of professional situations, the student develops as a specialist and socializes.

In the current state of education, contextual learning becomes especially relevant because it focuses on the development of personality, which is understood as an internally and externally determined process of becoming a future specialist as a subject of activity. The holistic construction of professional knowledge of the future specialist requires integrative learning, based on the ideas of didactic integration and synergism, provides both semantic and procedural integration. All components of such training are interconnected and form a coherent system [20].

Thus, the contextual learning strategy, in our opinion, focuses on the essence of vocational education, contributes to the awareness of their own professional position and self-actualization of the future specialist. This technology helps to eliminate some "problem areas" of professional training of future professionals and allows to ensure the achievement of expected results of the educational process, improving the level and quality of training of graduates.

## CONCLUSIONS

Thus, the training of specialists in physical therapy and occupational therapy for the effective implementation of the educational process in a medical school requires the use of such interconnected innovative pedagogical technologies as: technologies of personal and professional development; full acquisition of knowledge; information and communication; research and contextual learning.

## REFERENCES

1. Bielikova N. O. Suchasni tendentsii profesiinoi pidhotovky maibutnikh fakhivtsiv z fizychnoho vykhovannia ta sportu [Current trends in the training of future professionals in physical education and sports]. *Visnyk Chernihivskoho nats. ped. un-tu im. T. H. Shevchenka*. 2013;112:52–56. (in Ukrainian).
2. Fastivets A., Khomenko P., Shaparenko I. Kontseptualni pidkhody do doslidzhennia problemy profesiinoi pidhotovky fakhivtsiv z fizychnoi terapii [Conceptual approaches to the study of the problem of professional training of specialists in physical therapy]. *Wiadomosci Lekarskie*. 2018; 71(3):781–786. (in Ukrainian).
3. Pometun O.I., Pobirchenko N.S., Kobornyk H.I. et al. Interaktyvni tekhnologii : teoriia ta metodyka [Interactive technologies: theory and methodology]. K.: 2008, 92 p.
4. Ivani I. Kompetentnisnyi pidkhid do profesiinoi pidhotovky vchytelia fizychnoi kultury [Competence approach to professional training of physical education teachers]. *Fizyчне vykhovannia, sport i kultura zdorovia v suchasnomu suspilstvi*. 2013;1(21):43–47. (in Ukrainian).
5. Akimova O.V. Teoretyko-metodychni zasady formuvannia tvorchoho myslennia maibutnoho vchytelia v umovakh universytetskoï osvity [Theoretical and methodical bases of formation of creative thinking of the future teacher in the conditions of university education] : avtoref. dys. na zdobuttia nauk. stupenia d-ra ped. nauk : spets. 13.00.04 «Teoriia i metodyka profesiinoï osvity». Ternopil. 2010, 41p. (in Ukrainian).

6. Akhmetov R.F. Problemy y perspektyvy formuvannya profesiinoi maisternosti fakhivtsiv fizychnoi kultury zasobamy innovatsiinykh tekhnolohii [Problems and prospects of formation of professional skill of specialists of physical culture by means of innovative technologies]. *Visn. Zhytomyr. derzh. un-tu im. I. Franka*. 2007;34:50–52. (in Ukrainian).
7. Petruk V.A. Formuvannya bazovoho rivnia profesiinoi kompetentnosti u maibutnykh fakhivtsiv tekhnichnykh spetsialnostei zasobamy interaktyvnykh tekhnolohii [Formation of the basic level of professional competence in future specialists of technical specialties by means of interactive technologies]. *Vynnytsia: VNTU*. 2011, 284 p. (in Ukrainian).
8. Donchenko V. I., Zhamardiy V. O., Shkola O. M. et al. Health-saving competencies in physical education of students. *Wiadomości Lekarskie*. 2020;73(1): 145–150.
9. Sysoieva S.O. Pedahohichni tekhnolohii. *Entsyklopediia osvity [Pedagogical technologies. Encyclopedia of Education] / Akad. ped. nauk Ukrainy, hol. red. V. H. Kremen. K.: Yurinkom Inter*. 2008, 661p. (in Ukrainian).
10. Kutsevol O. M. Rol kreatyvnoho seredovyscha u formuvanni tvorchoi osobystosti v yii ontogenezi [The role of the creative environment in the formation of creative personality in its ontogenesis]. *Kreatyvna pedahohika*. 2010;1:63–68. (in Ukrainian).
11. Dubaseniuk O. A. Profesiina pedahohichna osvita : kompetentnisnyi pidkhid [Professional pedagogical education: competence approach]: monohrafiia.. *Zhytomyr: Vyd-vo ZhDU im. I. Franka*. 2011, 412 p. (in Ukrainian).
12. Bykov V.Yu. Metodolohichni ta metodychni osnovy stvorennia i vykorystovuvannya elektronnykh zasobiv navchalnoho pryznachennia. *Kompiuter u shkoli ta simi [Methodological and methodical bases of creation and use of electronic means of educational purpose. Computer at school and family]*. 2012;2(98): 3–6. (in Ukrainian).
13. Hurevych R.S. Informatsiino-komunikatsiini tekhnolohii v profesiinii osviti [Information and communication technologies in vocational education]. *Lviv*. 2012, 506 p. (in Ukrainian).
14. Mykytenko P.V. Suchasni kompiuterno-oriientovani tekhnolohii osvितnikh vymiriuvan: analiz, porivniannia ta vybir [Modern computer-based educational measurement technologies: analysis, comparison and selection]. *Naukovyi chasopys NPU imeni M. P. Drahomanova*. 2015;15(22):144–150. (in Ukrainian).
15. Kademiia M.Yu. Vykorystannia informatsiino-komunikatsiinykh tekhnolohii navchannia u vyshchykh navchalnykh zakladakh [The use of information and communication technologies in higher education]. *Visnyk LNU imeni Tarasa Shevchenka*. 2013;21(280):46–52. (in Ukrainian).
16. Vasianovych H. Metodolohichni konteksty pedahohichnoi nauky na suchasnomu etapi yii rozvytku [Methodological contexts of pedagogical science at the present stage of its development]. *Pedahohika i psykholohiia profesiinoi osvity*. 2013;3:9–30. (in Ukrainian).
17. Stoianov V.A. Profesiina pidhotovka vchyteliv fizychnoi kultury v umovakh modernizatsii vyshchoi osvity [Professional training of physical education teachers in the modernization of higher education]. *Zbirnyk naukovykh prats Berdianskoho derzhavnoho pedahohichnoho universytetu*. 2012;4:265–269. (in Ukrainian).
18. Chaika V.M. Pidhotovka maibutnoho vchytelia do samorehuliatcii pedahohichnoi diialnosti [Preparation of the future teacher for self-regulation of pedagogical activity]: monohrafiia. *Ternopil:TNPU*. 2006, 275p. (in Ukrainian).
19. Herliand T.M. Tekhnolohiia kontekсноho navchannia u profesiinomu rozvytku osobystosti maibutnoho fakhivtsia [Technology of contextual learning in the professional development of the future specialist]. *Teoretychni ta metodychni zasady osobystisno-profesiinoho rozvytku maibutnoho vchytelia : materialy mizhnar. nauk.-prakt. internet-konferentsii (m. Vynnytsia, 26-27 lystopada 2014 r.)*. *Vynnytsia: TOV «Nilan LTD»*. 2014, 35p. (in Ukrainian).
20. Ortynskyi V. L. Pedahohika vyshchoi shkoly [Pedagogy of high school]: navch. posib. K.: Tsentр uchbovoi literatury. 2009, 472 p. (in Ukrainian).

*The research is carried out within the framework of research topic of the Department of Biomedical Disciplines and Physical Training of Poltava V. G. Korolenko National Pedagogical University «Theoretical and methodical aspects of natural-science education of physical training specialist-to-be under the conditions of higher education system modernization» (state registration №0117U003237), as well as in the framework of research work (state registration №0120U100561) «Theoretical and methodological aspects of health care technologies and the development of physical preparation by means of physical education in the process of professional preparation in students' education» Departments of Physical Education and Health, Physical Therapy, Occupational Therapy with Sports Medicine and Physical Rehabilitation of Poltava State Medical University.*

#### ORCID and contributionship:

Anna V. Fastivets: 0000-0001-6333-5519 <sup>A,B,D</sup>

Anatolii V. Emetc: 0000-0002-2088-8428 <sup>B,E</sup>

Yevheniia O. Skrinnik: 0000-0001-5741-4384 <sup>D,F</sup>

Oleksandr V. Petryshyn: 0000-0002-5722-8036 <sup>A,E,F</sup>

#### Conflict of interest:

*The Authors declare no conflict of interest.*

---

#### CORRESPONDING AUTHOR

##### Anna V. Fastivets

Poltava Business Institute of Higher Educational

Institution "Academician Y. Bugay

International Scientific-Technical University

7 Sinna St., 36039 Poltava, Ukraine

tel: +380664292052

e-mail: anna\_fast@ukr.net

**Received:** 04.02.2022

**Accepted:** 22.05.2022

---

**A** – Work concept and design, **B** – Data collection and analysis, **C** – Responsibility for statistical analysis,

**D** – Writing the article, **E** – Critical review, **F** – Final approval of the article