



**PROFESSIONAL COMPETENCIES AND EDUCATIONAL
INNOVATIONS IN THE KNOWLEDGE ECONOMY**

Collective monograph

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Bulgaria
2020

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ISBN 978-619-91511-0-5

Professional competencies and educational innovations in the knowledge economy: collective monograph / Editors Lyubomira Popova, Mariana Petrova. Veliko Tarnovo, Bulgaria: Publishing House ACCESS PRESS, 2020. 532 p.

Publisher: Publishing House “ACCESS PRESS”

32 Alexander Burmov Str., 5000 Veliko Tarnovo, Bulgaria

Email: office@access-bg.org

<http://www.access-bg.org>

ISBN 978-619-91511-0-5

*Authors are responsible for the content and accuracy.
The proceedings have not been amended or proofread.*

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**METHODICAL SYSTEM OF PRACTICAL AND TECHNICAL TRAINING
FOR FUTURE IT TEACHERS IN THE CONTEXT OF BLENDED LEARNING**

Abstract. *The given research analyzes the basic scientific ideas, concepts and theoretical and methodological approaches to the introduction of blended learning in higher education institutions, outlines the basic tendencies of scientific exploration concerning the problems of research and possible ways of its solution. In particular, the methodical system of practical and technical training of future IT teachers is proved, which is based on the ideas to provide blended learning, competence approach, formation of information and technical competencies of a specialist. A model of methodical system of practical and technical training for future IT teachers in the context of blended learning has been developed for the realization of the main tasks set out in the research. The implementation of methodical system involves creation of information and educational environment that provides high-quality practical and technical training of future IT teachers and promotes their information and technical competencies. The basis for the formation of information and educational environment is the learning management system that combines educational and methodological provision of disciplines, e-learning courses, external online services and resources, cloud-oriented environment and other means of providing the educational process.*

Introduction.

Active development of information technologies and rapid change from one innovation to another confirm the fact that technological skills become insufficient every 2-3 years.

Stability of traditional education system leads to the fact that graduates of higher education institutions have outdated knowledge and skills that do not correspond with the realities of professional activity. Especially it concerns IT teachers, who are specialists in information and communication technologies and computer technicians, as well as any person who should quickly respond to the changes in IT industry.

A modern IT teacher should have competencies that enable him to use information processing technologies, tools and devices for manipulation of text, graphics, video and audio data, integrated development environments, local and global networks, modern means of communication of all kinds, educational software, implemented on the basis of multimedia, hypertext, hypermedia, communications, etc.

Thus, the technologization and informatization of society generate new ideas about educational results of future IT teachers, which cannot be achieved in the context of traditional education. The implementation of modern information and communication technologies, the construction of information and educational environment, the use of methods of active learning, project and distance learning technologies open new perspectives for improving the efficiency of educational process and contribute to solving this problem.

At the same time, the disadvantages that occur while using these technologies, especially distance learning technologies, reduce the productivity of learning due to their artificiality. Real communication, emotional contact of the participants of educational process, use of material objects and devices is an important condition for practical and technical training of future IT teachers and formation of their information and technical competencies. In addition, the technical knowledge and practical skills that a future teacher must possess may not always be acquired in the context of distance learning. Significant complexity in the organization of online learning lies in the implementation of operations related to practical and technical activities in the learning process of computer's structure, the range of components of computer engineering, troubleshooting and modernization of computer systems, setting up the network and other practice-oriented tasks. You can overcome these disadvantages and increase the efficiency of educational process by implementation of blended learning that gives possibility to combine the benefits of traditional and distance learning, to use learning time rationally, to improve practical and technical training through the optimal combination of the lessons online and in the classroom.

The analysis of scientific works confirms the relevance of issues related to the improvement of practical and technical training of future teachers [9, 21, 22] (I. S. Voitovych, V. M. Demianenko, M. P. Malezhyk, V. P. Serhienko, S. M. Yashanov) and implementation of blended learning in higher education institutions [3, 8, 14, 15, 18, 20] (V. Y. Bykov, S. O. Semerikov, O. M. Spirin, Yu. V. Tryus, V. M. Kukharenko, A. M. Struk). A considerable number of scientific and methodological approaches to the project of blended learning are embodied in the works of foreign scientists [2, 4, 6, 7, 10, 13, 17] (K. Bonk, C. Graham, A. Norberg, H. Staker, B. Khan, M. Horn).

Pointing out the considerable potential of previous works in the field of training of future teachers and implementation of blended learning, we denote that the issue of developing a comprehensive methodological system of practical and technical training of future IT teachers in blended learning remains out of researchers' attention.

1. Theoretical and methodological means of practical and technical training in the context of blended learning

Nowadays, most higher education institutions (HEIs) keep to traditional models of learning organization, but the processes of computerization and prevailing computerization of educational institutions are irreversible and involve significant changes in organizational forms. At the same time, the level of development of ICT means and active implementation of computer-based learning indicate that digital education is becoming a traditional way of gaining knowledge among most countries in the world [11]. Both educational institutions and corporate organizations are increasingly turning to e-learning technologies and recognizing them as an effective means of building their own educational trajectory.

Pedagogical potential of information and communication technologies (ICT), the active implementation of e-learning and distance learning, the availability to use the Internet and mobile communication tools have contributed to the appearance of a new form of educational process organization - blended learning.

Blended learning can be defined as a purposeful process of transferring and assimilating knowledge, abilities, experience, skills and methods of cognitive activity based on the combination of traditional, computer-based, distance learning and mobile-oriented learning technologies. Blended learning involves the rational use of learning time, the adaptation of educational process to the students' individual needs, the diversification of knowledge sources, the usage of flexible means to diagnose and monitor academic achievement, the feedback organization and, as a result, it improves the productivity of students' learning activities. Therefore, blended learning is a qualitatively new approach that transforms the structure and content of learning, changes the traditional roles of a teacher and a student in order to achieve high educational results.

The widespread expansion of the concept of blended learning and its realization in practice have influenced the appearance of a large number of blended learning models that have found their implementation in foreign practice and are being implemented in domestic educational institutions [19]. Among a large number of blended learning models, the biggest development reached the following: rotational model, flexible model, self-blending model, virtual-enriched model. As a result of the analysis of different models of organization of blended learning and their peculiarities of implementation into the educational process, it is revealed that in the practice of training of future IT teachers it is appropriate to consider rotational models of organization of educational activity (model of change of stations, model of change of laboratories, model of inverted learning). The choice of rotational model of blended learning organization in the process of practical and technical training of future

IT teachers is due to the fact that the implementation of this model is not burdened by such long-term processes as revision of specialist training curriculum plans, change and correction of standards at the highest level, which require considerable effort not only from teachers but also from the authorities. In addition, this process can take a long time, and modern educational technologies are very quickly upgraded and improved. Instead, the introduction of rotational models requires changes to the training curricula, which is much faster, easier and more efficient.

According to the methodological concept of our research, the effectiveness of a future IT teacher is influenced by the implementation of competence approach in the educational process.

The competence approach is based on the change of the higher education paradigm, which has led to the transition from knowledge to competence model of specialists' training [16]. In the process of practical and technical training of future IT teachers, an important structural component of professional competencies is its information and technical competencies, which provide for the formation of relevant technical knowledge, abilities, skills and experience of performing professional tasks. Such competencies are revealed in the desire and willingness for effective usage of modern technical means and information and communication technologies to solve problems in professional activity, daily life, realizing the importance of the subject and the result of the activity at the same time.

The analysis of scientific literature on the implementation of competence approach in the process of practical and technical training of future IT teachers, curriculum plans and programs for specialists' training, the content of special technical and informational disciplines made it possible to determine the structure of information and technical competencies of an IT teacher (Fig. 1).

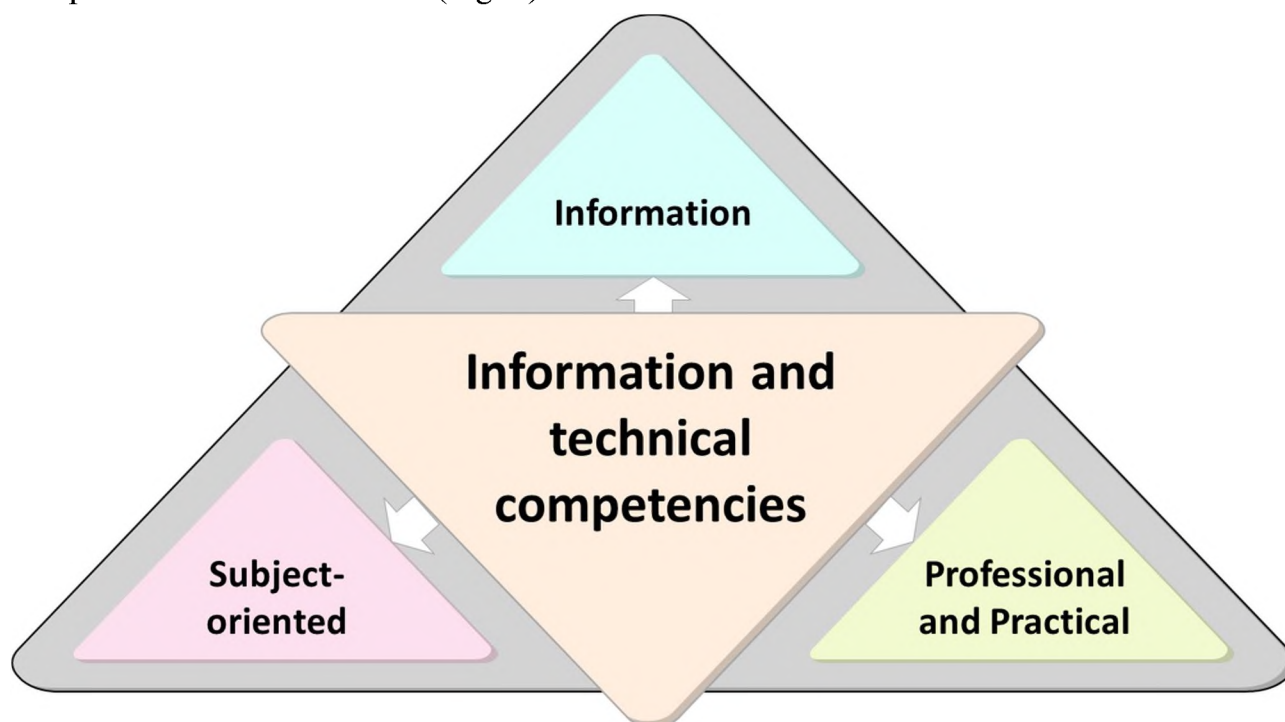


Fig. 1. The structure of information and technical competencies of a future IT teacher

Each group of competencies, in turn, is revealed at the level of such criteria as motivational-axiological, content and operational-activity. Information competencies include the teacher's knowledge, skills, abilities and experience to use a computer as a primary tool for the realization of information technologies, pedagogical software, different teaching methods that involve using information and communication technologies. We have outlined the following criteria for the formation of information competencies of an IT teacher:

- motivational-axiological criterion implies the availability of motives for the usage of ICT in professional activity, readiness and interest for work with ICT tools, setting and awareness of the purpose of information activities;

- content criterion implies knowledge in the sphere of information support for educational process, modern approaches to the usage of computer engineering during IT lessons; ability to analyze, classify and systematize hardware components of computer engineering;

- operational-activity criterion implies the availability of skills to use ICT in practice; demonstrates the effectiveness and efficiency of future IT teacher activities.

Professional and practical competencies characterize the ability of a specialist to solve a certain range of professional problems, which within the information and technical competency of an IT teacher are related to practical and technical issues.

The following criteria meet professional and practical competencies:

- motivational-axiological criterion implies availability of motives for improvement of information and technical component of educational institution, readiness to carry out transformational processes by implementation of the newest means of computer engineering, interest in working capacity of computer engineering tools, etc.;

- content criterion implies knowledge in the sphere of technical support of educational institution, which involves the deployment of computerization and informatization processes; knowledge of the functions, duties, rights, responsibilities of an IT teacher; it also involves defining relationships with the authorities of educational institution;

- operational-activity criterion implies the ability to carry out professional and practical activity within the limits of their competence. In particular, this activity concerns coordination of informatization and computerization processes in educational institution, consulting in the field of implementation of modern ICTs in the educational process, organization of the information educational environment (IEE) in the institution, ability to modernize and maintain computer engineering, etc.

Subject-oriented competencies reflect the fundamental knowledge and skills of the subject field and, accordingly, of the subject - IT. The theoretical knowledge and practical skills of an IT teacher should be at a much higher level than those required to master an IT school course. In addition, it is necessary to know methodological means how to acquire new knowledge and skills quickly due to the rapid technologization of society and computer engineering.

Subject-oriented competencies have the following criteria:

– motivational-axiological criterion implies the availability of motives for mastering technical knowledge, skills and abilities;

– content criterion implies the availability of technical knowledge: the structure and principles of operation of modern computer hardware; technical parameters of the functional units of computer hardware; basics of organization of hardware computing processes; operating system (OS) hardware support; modes of functioning and diagnosis of computer hardware; principles of construction and operation of computer networks of different range; organization of client-server work in a network.

– operational-activity involves the availability of technical skills: analysis of technical parameters of functional units of computer hardware; work in different modes of computer hardware operation; OS adjustment according to the hardware parameters; carrying out diagnostics and maintenance of computer hardware; implementation of the hardware configuration; installation, setup and maintenance of computer engineering; study of types and parameters of computer hardware.

Thus, information and technical competencies integrate knowledge (about the principles of construction and operation of specific technical devices), ability (to use existing knowledge to solve technical problems at the level of their professional qualifications), skills (usage, maintenance, repair, component sets of technical equipment), experience (to teach educational material in the technical field easily) and are revealed in the desire and willingness to use modern technical equipment and computer technologies effectively in order to solve problems in professional activity and daily life, thus realizing the importance of the subject and performance result.

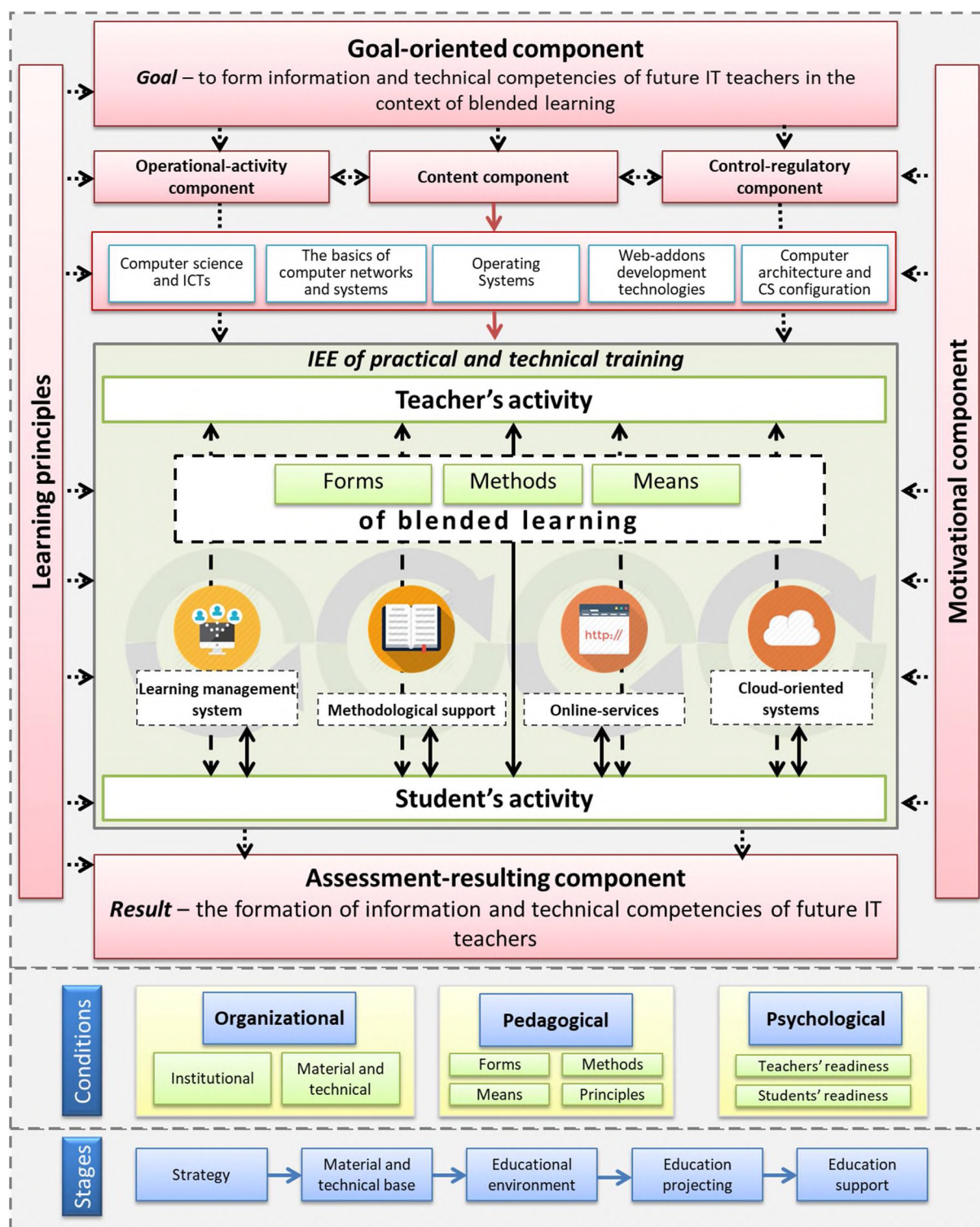
Determination of the basic theoretical statements of our research allowed us to design a model of methodical system of practical and technical training of future IT teachers in the context of blended learning (Fig. 2).

The model is based on the following components: *goal-oriented, motivational, content, operational-activity, control-regulatory and assessment-resulting*.

The goal-oriented component provides the realization of the main goal of methodological system - improvement of practical and technical training and formation of information and technical competencies of future IT teachers in blended learning.

The motivational component ensures support of constant interest in practical and technical training, the study of disciplines of information and special-technical direction, necessity for the formation of information and technical competencies.

Learning principles are the basic requirements for blended learning organization. Apart from generally accepted principles of traditional education, we have highlighted methodological principles that are inherent in blended learning and are oriented on the practical and technical training of an IT teacher: the priority of self-study, cooperation between a teacher and students, individualization, flexibility, interactivity, relevance, actualization of learning outcomes, consciousness, professional orientation.



- > intermediated communication using ICT;
- > immediate communication at the traditional intramural (classroom) education;
-> interconnection of model components.

Fig. 2. Model of methodical system of practical and technical training of future IT teachers in the context of blended learning

The content component contains a curriculum plan, curriculum programs for the subjects of practical and technical training of a future IT teacher, educational-

methodological complexes, which can be reflected in electronic training courses of blended learning and integrated with online services Internet networks, etc. The content component of practical and technical training involves learning the disciplines of general professional training of future IT teacher "Informatics and Information and Communication Technologies", "Database Organization", "Web-addons Development Technologies", "Operating Systems", as well as special and technical disciplines – "Computer Architecture and Computer System Configuration", "The Basics of Computer Networks and Systems", etc.

The operational-activity component involves the formation of skills and abilities of practical and technical activity of a future specialist and reflects the procedural essence of the academic disciplines learning.

The control-regulatory component is aimed at the constant control over the students' educational and cognitive activities in the process of academic disciplines learning. For this purpose, specially designed questionnaires, quizzes, tests are used.

The assessment-resulting component provides for determining the level of information and technical competencies of the future IT teacher. This component also contains indicators of the formation of information and technical competencies and methods of their assessment.

A key component of the model is the information and educational environment (IEE) as a set of information resources – means, tools, technologies, forms, methods, services that contribute to the achievement of educational goals - the formation of information and technical competencies and improving the quality of practical and technical training of future IT teachers.

The structure and model of the methodical system of practical and technical training of future IT teachers also defines the conditions and stages of implementation of blended learning in higher education institutions.

Organizational and pedagogical conditions combine such groups of conditions as organizational, pedagogical and psychological.

To follow the organization conditions, a systematic approach is important, which ensures the solution of problems with technical, curricular, methodological, staff, legislative and regulatory framework support, as well as with the management of educational process and improvement of electronic, distance, mobile means of learning (Fig. 3).

Pedagogical conditions determine the content of education in blended learning, forms of organization, methods, principles and means of blended learning. At the same time, an important role belongs to psychological and pedagogical factors of learning, which imply the willingness of both pedagogical staff and students to blended learning.

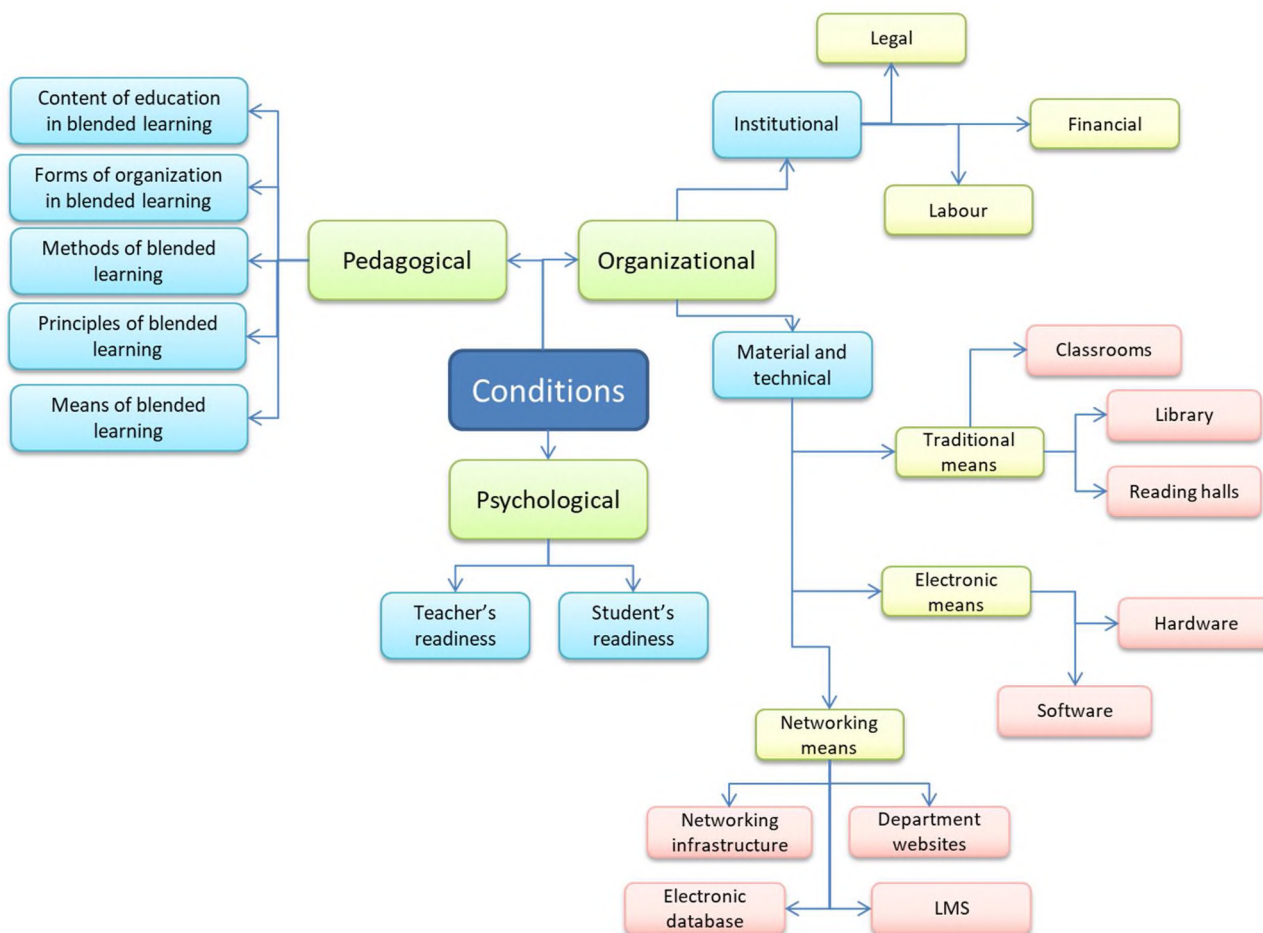


Fig. 3. Organizational and pedagogical conditions for the implementation of blended learning in higher education institution

Implementation of new technology or education methodology has stages – process stages, that indicate its dynamism and development. We have identified and substantiated the following stages of implementation of blended learning in the HEI: defining strategy for the implementation of blended learning; improvement of the material and technical bases of HEI; creation of information and educational environment; project of education; support of educational process (Fig. 4).

Defined organizational and pedagogical conditions and stages of implementation of blended learning make it possible to organize educational activities in the HEI effectively and achieve high quality training of specialists. Important stages are the following: appointment of the managerial body for implementation of blended learning and outlining the overall strategy for the organization of educational process, improving the material and technical bases, construction of information and educational environment, project of the content of education oriented on the competency model of specialist and means of blended learning, and constant monitoring and control of educational activities.

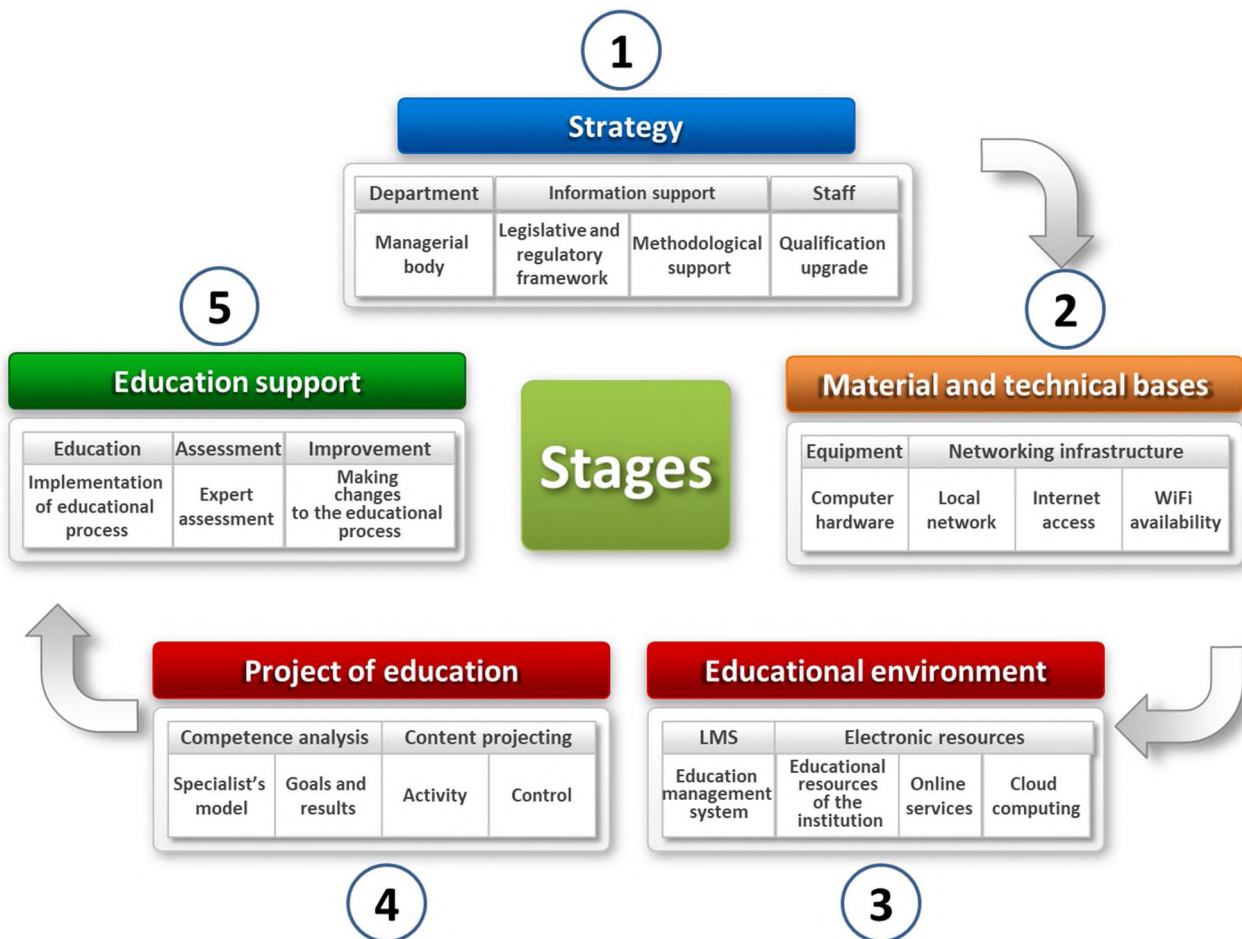


Fig. 4. Stages of implementation of blended learning in higher education institution

The designed model is the basis for the development of methodical system of practical and technical training of future IT teachers in the context of blended learning.

2. Information and educational environment for practical and technical training of future IT teachers

An important component in the model of methodical system of practical and technical training of future IT teachers in the context of blended learning is information and educational environment (IEE), which meets the requirements of information society, the state of development of modern ICTs, world educational standards and contributes to the improvement of professional training of future teachers. The development of networking technologies and the appearance of new educational means for the development of educational resources make it possible to solve the problem of organization of higher education institutions effectively.

The basis for the formation of IEE of practical and technical training of future IT teachers in the context of blended learning, is the system of learning management, which integrates educational and methodological support of disciplines, electronic educational courses, external online services and resources, cloud-oriented environment and other means of educational process support (Fig. 5).

The IEE may also include: HEI website, departments websites, library, electronic library, electronic repository, file database (with electronic manuals, compendiums of lectures, instructor's manuals, curricular programs, tests), other educational resources (teachers' personal sites, blogs). Analyzing the process of designing IEE, world famous speaker in the field of e-learning and educational technologies B. Khan mentions [7] that creation of educational resources involves activities in which the main components are people, process, product. People are the administration, teachers, support staff; process - creation of educational resource; final product - ready-to-use, certified educational resource. In this case, teachers play a key role because they provide educational process and create learning resources.

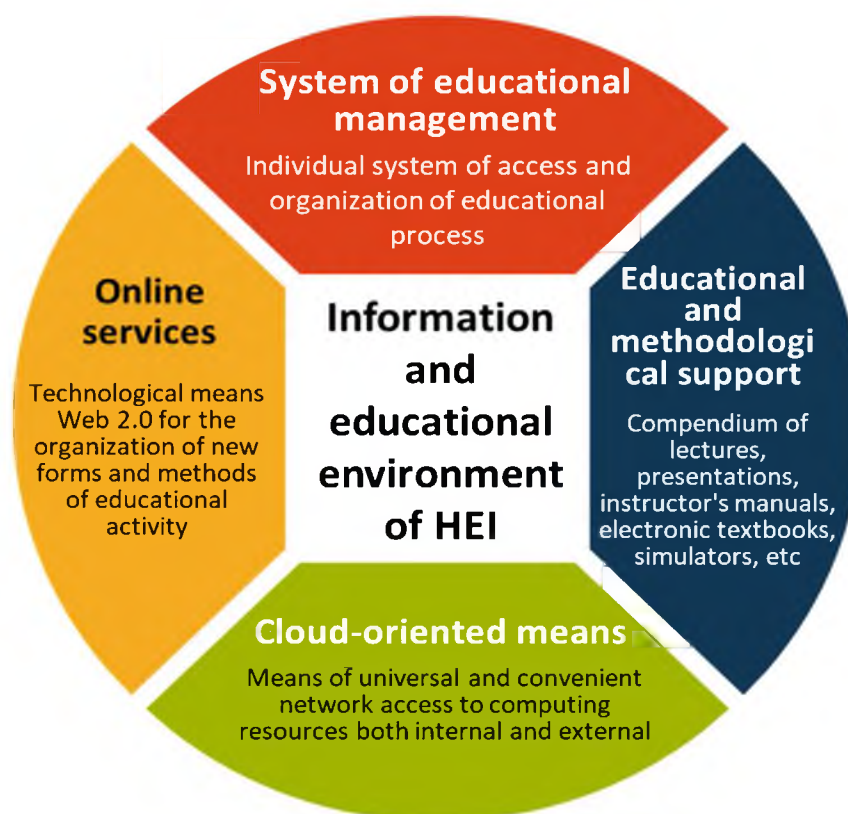


Fig. 5. Possible structure of information and educational environment of HEI

To support the educational process, pedagogical staff create educational resources that are publicly available in the IEE. Such resources include electronic educational courses (EECs), educational materials from individual modules or disciplines, tutorials, programs, simulators, video resources, etc. Creation of a network of educational resources on the basis of IEE allows to reduce the cost of access to educational materials, increases the activity of participants of educational process, develops competencies not only of students, but also of teachers in the process of development of educational resources and organization of educational process with their usage [8, p. 22]. The main educational resource in the process of practical and technical training of future IT teachers in the context of blended learning is e-learning course, which allows to organize the process of individual and group online learning and to combine different types of resources on one platform.

According to the Distance Learning Regulations, e-learning course can be understood as “the systematic collection of information and educational and methodological material necessary to acquire academic disciplines (curriculum programs) accessible via the Internet (local network) through a web browser and / or other software tools accessible for the users” [12].

E-learning course in blended learning provides not only a structured representation of educational resources, the creation and organization of laboratory work, self-work, controlling activities, but also the integration of distance, cloud-oriented and mobile-oriented technologies. The usage of e-learning courses together with online services helps to consolidate and complement the IT teacher training program, diversify the educational process, and enhance the level of IT competencies.

The implementation of e-learning course implies the following requirements:

1. Basic requirements for the e-learning course:

- the possibility of effective management of students’ educational activity in the study of discipline;
- availability of motivation for educational and cognitive activity;
- rational combination of technologies to present educational material;
- organization of different forms of educational activity on the basis of communication technologies.

2. The content of the e-learning course:

- compliance with educational standards, adequacy of volume, relevance and novelty of educational material;
- systematicity, integrity of educational material presentation, clarity and logic of task setting;
- the usage of different methods and means of activization of cognitive activity.

3. Structure of the e-learning course:

- *information and content group*: information component may contain information about the course (topic), terms, lessons schedule, reporting, consultations; content - curriculum, program, educational textbooks, plans for seminars, topics of creative work, instructor's manuals;
- *controlling and communicative group*: may contain feedback tests, questions for control and self-control, preparation for tests and exams, information about assessment criteria;
- *correction and summary group*: contains the results of students’ educational work.

4. Technical systematization of the e-learning course. It involves considering the parameters of working ability (sufficient memory to store the resources of students’ answers, the correct display of pages and settings of automatic installation), ergonomic (clarity, convenience, structure) and artistic (adequacy of usage and combination of multimedia tools) features.

An essential characteristic of modern electronic educational resources in IEE is their multimedia, which allows to combine visual (images, figures, diagrams, slides of presentation, etc.) and audio educational material (educational radio programs, podcasts). Multimedia tools can be used at all educational stages, in particular, in the course of: self-preparation for classes; explanation of new material, consolidation, revision, diagnosis and control of educational achievements. It should be noted, that multimedia tools should not replace the teacher completely, but can only supplement, make the learning process more productive. Among a wide variety of pedagogical means that allow to combine multimedia resources effectively, multimedia presentations and videos should be distinguished.

Analysis of multimedia development software shows that there is now a wide selection of tools for creating presentation material, but in the widespread usage of the Internet and cloud services, it is advisable to take into account software that deviate from traditional slideshow technology and use integrated, cloud-oriented, mobile and nonlinear methods of material visualization. One of such software is Prezi cloud service [1], which is designed to create presentations of a nonlinear structure with effects of scaling and moving in space. One of the main and important differences from PowerPoint is the ability to work not with individual slides, but on a single workspace, where the necessary elements are placed with the effects of moving, zooming in or out of the imaginary camera. Thanks to this, the viewer intuitively understands what level of generalization and detail he is at a particular moment. Such forms of submission are very well suited for demonstrating technical processes and relationships that are important in the process of practical and technical training of future IT teachers.

Therefore, the dynamics and visual way of presentation of educational material are important in the study of computer science disciplines. However, the usage of presentation material in which the text is combined with the graphics is not sufficient. Completely different emotional, psychological and pedagogical load is the educational resources in the form of video materials. Precisely because of the material presentation in the form of video, such video service as Youtube has gained its popularity, which has millions of video lessons, reviews, video tutorials in different languages. However, it is not always appropriate to use this service when studying a particular discipline. Firstly, along with a lot of quality material, there are some poor quality videos; secondly, the material is downloaded by any user of the network and does not always contain the subjects or sections of the discipline required for the study; thirdly, the teaching style of the material almost always goes against the teaching style in the classroom; fourthly, there is a small amount of material, including Ukrainian language and technical content [5, p. 195]. That is why, it is necessary to explore the issue of creating effective video materials and uploading them for free access in IEE.

The issue of usage of multimedia tools in the form of video materials to learn special and technical and computer science disciplines requires a thorough and deep study, since the practice of preparing such resources is practically absent.

The process of creation of video materials can be divided into three main stages: planning (scenario stage); collection of materials (shooting stage); editing (assembling and editing of filmed fragments). Creating and using video materials in the educational process involves not only the use of technical and software tools to create video resources, but also adhering to the didactic features of their design and ability to use these tools depending on the purpose of education. In general, the use of video materials in the organization of distance learning (video lectures, video workshops, video seminars, virtual excursions, video explanations and other video materials) makes it possible to improve the practical and technical training of future IT teachers and increase their level of information and technical competencies.

With the development of mobile technologies, mobile-oriented tools are becoming increasingly important among educational resources. Modern mobile devices make it possible to create such types of resources as mobile application, mobile site, adapted electronic educational tools, social networks and user resources, unique mobile resource (augmented reality), individual types of resources prepared by the teacher. Augmented reality technology has a great potential in the process of preparation and formation of information and technical competencies, because virtual visualization enables the transfer of external parameters of a technical object without the use of real devices. This is especially important to understand the principle of operation of the device, its components and interconnection features, the algorithm of connection of technical tools, the collection of individual components, etc. Augmented reality technologies allow you to display, in real time, tips for installing, configuring, connecting or positioning your device, and performing other activities. This is achieved by imposing software and hardware on a real virtual data object.

The usage of multimedia materials and mobile-oriented resources in the process of practical and technical training of future IT teachers requires the continuous development of IEEs and existing hardware and software that would comply with the current level of information technology. This involves spending additional money and attracting human resources, including technical specialists to upgrade the material and technical bases. In this case, the effective solution to this problem is implementation of cloud technologies in educational process and transfer of computing and data processing from personal computers and HEI servers to the Internet servers. This significantly reduces the load on internal resources and expenditures for purchasing the new ones, and thus saves the costs and resources of HEI. An important aspect of IEE functioning is the organization of pedagogical interaction of participants in educational process. Education is a communication between teacher and students, in the process of which new knowledge is being reproduced and assimilated, there is a reflection and understanding of scientific theories, concepts, judgments. The organization of education can take different forms: paired (communication between two participants of educational process, where one speaks, the other listens); group (each participant may share certain information with other members of the group); collective (communication in dynamic pairs (with variable participants) of different participants in turn with each other, mainly in pairs); individual (mediated communication caused by the ability to communicate without direct contact).

Communication of educational activity entities could be held by means of different software and hardware tools. In the conditions of conducting online classes a webinar can become such a type of communication, a mobile messenger can be used for organization of consultations, a forum can be used for discussion, etc. Each tool has its own advantages, disadvantages and shortages, but its effectiveness depends on the purpose of its usage.

Webinar technology provides powerful functionality for organizing online tutorials and has significant didactic capabilities. Almost all types of classroom lessons in traditional education can be implemented through webinars. It has been found that this form of education organization cannot replace traditional education completely, but its usage improves and advances the educational process greatly. With the help of mobile messengers, it is possible to organize various types of educational activities, which allow to form not only the communicative but also the information and technical competencies of future specialist. An important aspect of using mobile messengers in educational activities is their availability, free access, convenience, fast messaging at any time, at any place. The model of interaction between the teacher and the student becomes a prototype of the relationship that will occur in the course of future professional activity.

Conclusions.

Summarizing the results of our research of practical and technical training of future IT teachers in the context of blended learning we can draw the following conclusions:

- Blended learning remains the leading trend in the sphere of education, which transforms the structure and content of education, changes the traditional roles of teacher and student, enables to obtain high educational outcomes due to combination of different educational technologies.
- Organization of practical and technical training of a future IT teacher in the context of blended learning should be carried out on the basis of implementation of the competence approach as the dominant paradigm of education and activity approach to the formation of information and technical competencies of future IT teachers.
- A model of methodic system of practical and technical training of future IT teachers in the context of blended learning implies the presence of such compulsory components as: goal-oriented, motivational, content, operational-activity, control-regulatory and assessment-resulting.
- In order to ensure the effective implementation of methodical system of practical and technical training of future IT teachers in the context of blended learning, it is advisable to keep to the relevant organizational and pedagogical conditions and stages.
- An important component of practical and technical training of a future IT teacher is information and educational environment containing information resources (means, tools, technologies, methods, services) that are used by educational entities (students) with the purpose of gaining knowledge, development of personal abilities, finding and processing educational material, communication and collaboration.

– The basic principles of development of information and educational environment of practical and technical training of future IT teachers in the context of blended learning are the development of electronic learning courses, integration of online services in the system of educational management of higher education institutions, development of multimedia materials, implementation of cloud-oriented environment, the usage of mobile-oriented resources, organization of pedagogical interaction between teacher and students.

References

1. Bondarenko T. V. (2018) Peculiarities of software Prezi usage for designing educational presentations. *Information Technologies and Learning Tools*. Retrieved from: <https://journal.iitta.gov.ua/index.php/itlt/article/view/1907/1302> [in Ukrainian].
2. Bonk C. J., & Graham C. R. (2006) *The handbook of blended learning environments: Global perspectives, local designs*. San Francisco: Jossey-Bass/Pfeiffer.
3. Bykov V. Y., & Zhuk Yu. O. (2003) Theoretical and methodological principles of modeling of educational environment of modern pedagogical systems. *Problemy ta perspektyvy formuvannia natsionalnoi humanitarno-tekhnichnoi elity*. 1 (5). 64–76 [in Ukrainian].
4. Christensen M., Horn M., & Staker H. (2013) Is K-12 Blended Learning Disruptive? An introduction to the theory of hybrids. *Clayton Christensen Institute*. Retrieved from: <http://www.christenseninstitute.org/wp-content/uploads/2014/06/Is-K-12-blendedlearning-disruptive.pdf>.
5. Hlynskyi Ya. M., & Riazhska V. A. (2016, November 22-24) Development of electronic educational video resources for full-time and distance training courses. *Innovatsiini kompiuterni tekhnolohii u vyshchii shkoli : materialy 8-yi naukovo-praktychnoi konferentsii*. Lviv (pp.194-200) [in Ukrainian].
6. Khan B. H. (2014) Continuum in E-Learning: People, Process and Product (P3). Retrieved from: <https://elearningindustry.com/continuum-in-e-learning-people-process-andproduct-p3>.
7. Khan B.H., Corbeil J.R., & Corbeil M.E. Responsible Analytics and Data Mining in education. *Global Perspectives on Quality, Support, and Decision-Making* Retrieved from: <https://big-data-in-education.blogspot.com>.
8. Kukharenko V. M. (Ed). (2016) *Blended Learning Theory and Practice*. Kharkiv: Miskdruk [in Ukrainian].
9. Malezhyk P. M., Malezhyk M. P., & Tkachuk H. V. (2018) Formation of subject competence in the study of operating systems in future bachelors in software engineering. *Science and Education a New Dimension. Pedagogy and Psychology*. VI (71). Issue: 173. 25-28 [in Ukrainian].
10. Norberg A. (2012) Blended Learning and New Education Logistics in Northern Sweden. *Game Changers: Education and information technologies*. Vol. 1. 327-330.

11. Online Learning Statistics And Trends. (2017) *Elearning Industry*. August 13. Retrieved from: <https://elearningindustry.com/online-learning-statistics-and-trends>.
12. Order of the Ministry of Education and Science on approval of the Regulations on distance learning № 466 (2013, April 25). *Ofitsiinyi visnyk Ukrainy*. 36, 202-206 [in Ukrainian].
13. Porter W. W., Graham C. R., Spring K. A., & Welch K. R. (2014) Blended learning in higher education: Institutional adoption and implementation. *Computers & Education*. Vol. 75. 185-195.
14. Semerikov S. O., Moiseienko N. V., & Moiseienko M. V. (2016) Mobile information and educational environment of a higher education institution. *Visnyk Cherkaskoho universytetu. Seriya «Pedahohichni nauky»*. 11. 20-27 [in Ukrainian].
15. Spirin O., Oleksiuk V., Oleksiuk O., & Sydorenko S. (2018) The Group Methodology of Using Cloud Technologies in the Training of Future Computer Science Teachers. *ICTERI*, 294-304. Retrieved from: http://ceur-ws.org/Vol-2104/paper_154.pdf.
16. Spirin O.M. (2009) Information and communication and informatic competences as komponents of the system of professional-specialized competences of informatics teacher. *Information Technologies and Learning Tools*. Retrieved from: <https://journal.iitta.gov.ua/index.php/itlt/article/view/183/169> [in Ukrainian].
17. Staker H., & Horn M. (2012) Classifying K-12 Blended Learning. Retrieved from: <http://files.eric.ed.gov/fulltext/ED535180.pdf>.
18. Striuk A. M. (2015) *Theoretical and methodological foundations of blended learning of system programming of future specialists in software engineering*. Kryvyi Rih: DVNZ "Kryvorizkyi natsionalnyi universytet" [in Ukrainian].
19. Tkachuk H. V. (2018) Analysis and peculiarities of introduction of different models of blended learning in the educational process of higher education institution. *Naukovi zapysky Ternopilskoho natsionalnoho pedahohichnoho universytetu imeni Volodymyra Hnatiuka. Seriya: Pedahohika*. 3. 28-36 [in Ukrainian].
20. Tryus Yu. V., Franchuk V. M., & Franchuk N. P. (2012) Organizational and technical aspects of the use of mobile education systems. *Naukovyi chasopys NPU imeni MP Drahomanova*. 12, 53-62 [in Ukrainian]
21. Voitovych I. S., Serhienko V. P., & Voitovych O.P. (2011) Psychological and pedagogical features of the implementation of the competency approach in computer support of the study of professional disciplines in universities. *Psykhohohiia: realnist i perspektyvy*, 1. 24-26 [in Ukrainian].
22. Yashanov S. M. (2015) Conceptual principles of designing the system of informative training of future teachers in terms of competency approach. *Mizhnarodnyi naukovyi forum: sotsiologhiia, psykhohohiia, pedahohika, menedzhment*. Vol. 17. 181-190 [in Ukrainian].

We guess that native lawmaker should elaborate the respective amendments already made in Criminal Code of Ukraine: at the bare minimum to change “genitals mutilation” into “females genitals mutilation” in the disposition of Art. 121 and consequently to exclude male circumcision from the its legal environment; as maximum – to hand out a body of crime “Female genitals mutilation” into the new article of Criminal Code of Ukraine allowing to correct technical and legal lawmaking mistakes.

References

1. Female genital mutilation: UNICEF. Retrieved from: <https://www.unicef.org/protection/female-genital-mutilation>.
2. Martianova T. (2018). Legal mistakes in criminal legislation: problems of criminalization and decriminalization. *Visnyk Natsionalnogo universytetu “Lvivska politekhnika”*. Seriya: “Yurydychni nauky”, 5, 894 (18), 142-147. [in Ukrainian].
3. Academic Interpretative Dictionary of the Ukrainian Language. Retrieved from: <http://sum.in.ua/s/kalictvo>. [in Ukrainian].
4. Ukrainian language dictionary. Retrieved from: <https://eslovnyk.com>. [in Ukrainian].
5. Female genital mutilation: World Health Organization. Retrieved from: <https://www.who.int/news-room/fact-sheets/detail/female-genital-mutilation>.
6. Council of Europe Convention on preventing and combating violence against women and domestic violence (Istanbul Convention) the 11 May 2011 year. Retrieved from: <http://www.coe.int/t/dghl/standardsetting/convention-violence/convention/Convention%20210%20Ukrainian.pdf>. [in Ukrainian].
7. Dudorov O.O., Khavroniuk M.I. (2019). *Responsibility for domestic violence and gender-based violence (a scientific and practical commentary on short stories Of the Criminal Code of Ukraine)*; za red. M. Khavroniuka. Kyiv : Vaite. [in Ukrainian].
8. Shkodiak Alona. (2019). Genital mutilation (Art.121 of Criminal Code of Ukraine) vs. female genital mutilation (§226a of Criminal Code of the Federal Republic of Germany). *Visegrad Journal on Human Rights*, 2 (2), 187-192. [in Ukrainian].
9. Kharytonova O.V. (2018) *Key principles of gender policy in the criminal law of Ukraine and main directions of reforms on combating violence against women and domestic violence: naukovo-praktychnykh posibnyk*. Kharkiv: Prava liudyny. [in Ukrainian].
10. Huntley J., Bourne M., Munro F., Wilson-Storey D. (2003). Troubles with the foreskin: one hundred consecutive referrals to pediatric surgeons. *Journal of the Royal Society of Medicine*. 96, 9.
11. Strict prison sentences will not put an end to female circumcision in Dagestan. Retrieved from: <http://inosmi.ru/social/20160825/237635535.html>. [in Russian].
12. Baida A.O. (2016). To the issue of criminalization of female genital mutilation. *Visnyk Asotsiatsii kryminalnoho prava Ukrainy: elektron. nauk. vyd.* Kharkiv. 2, 202-210. [in Ukrainian].

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Collective monograph

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Veliko Tarnovo, Bulgaria

Editors: Prof. Lyubomira Popova, Prof. Mariana Petrova

Publishing House “ACCESS PRESS”, Bulgaria, 2020

32 Alexander Burmov Str., 5000 Veliko Tarnovo, Bulgaria

Email: office@access-bg.org

<http://www.access-bg.org>

ISBN 978-619-91511-0-5