MODERN PEDAGOGICAL MODELS OF THE FORMATION AND DEVELOPMENT OF SPECIFICALLY SCIENTIFIC PEDAGOGICAL PHENOMENA

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The monograph is devoted to the problem of improving the system of higher education in Ukraine in the context of digitalization of education and society, integration into the European educational space, and increasing requirements for professional training. The monograph highlights the results of the dissertation works of scientists of the Municipal Establishment «Kharkiv Humanitarian and Pedagogical Academy» of the Kharkiv Regional Council, which have been tested and demonstrated the high efficiency of the developed technologies, systems, models and submodels for the management of higher education institutions, the process of professional training, education, development and education of future specialists. The modern ways of improving the quality of competence training of future pedagogical specialists are characterized. The materials of the monograph can be useful for teachers, research and teaching specialists and students of higher education in the fields of pedagogy, social work, management.

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8. Pro zatverdzhennia Bazovoho komponenta doshkilnoii osvity (Derzhavnoho standartu doshkilnoii osvity) nova redaktsiia : nakaz Ministerstva osvity i nauky Ukraiiny vid 12 sich. 2021 r. № 33. URL: https://mon.gov.ua/storage/app/media/rizne/2021/12.01/Pro_novu_redaktsiyu%20Bazovoho%20komponenta%20doshkilnoyi%20osvity.pdf (data zvernennшa: 01.02.2023). [ukr]

9. Sotsialni tsinnosti maloi hrupy shkoliariv : monohrafiia / za zah. red. T. F. Alieksieienko. Kyiv : Pedahohichna dumka, 2012. 180 s. [ukr]

10. Tanko T. P., Tararak N. H. Sotsialno-pedahohichni aspekty formuvannia zahalnoliudskykh tsinnostei u maibutnikh vykhovateliv zakladiv doshkilnoi osvity. *Zasoby navchalnoi ta naukovo-doslidnoi roboty*. 2018. Vyp. 50. S. 100–114. URL: https://dspace.hnpu.edu.ua/handle/123456789/7906 (data zvernennia: 10.02.2023). [ukr]

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TECHNOLOGY OF FORMATION OF SELF-EDUCATIION COMPETENCE IN FUTURE TEACHERS IN MODERN CONDITIONS

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The article highlights the relevance of one of the urgent problems of modern pedagogical education. The formation of a new generation of teachers capable of lifelong self-education takes on special importance in modern conditions associated with the dynamic development of the information society, as well as in

the situation of the spread of the coronavirus pandemic and the long-term state of war in Ukraine. The author defined the essence of the concept of «self-education of the future teacher», and identified the stages of self-education. The essence of self-education competence of the future teacher in the conditions of an open informational and educational environment and its structural components are presented: motivational-value, organizational, procedural-informational, and control-reflective. From the point of view of the system approach, constituent components of the competence of self-education are characterized. The essence and didactic functions of the information-educational environment are revealed, and their influence on the self-education process of students is described. Attention is focused on its development as a key factor in the formation of the competence of self-education of the future teacher. Aspects of the transformation of the self-education activity of the future teacher in today's conditions are singled out. Internet services for the development of self-educational competence are offered, and the advantages of existing educational platforms for the self-education of future teachers are clarified. The author justified the technology of formation of the specified competence in future teachers in the process of their professional training under modern conditions, characterized the approaches, directions, and guiding principles, the observance of which actualizes the achievement of a positive result of its implementation. The results of the experimental approbation of the developed technology in the institution of higher education are presented, which prove its effectiveness and feasibility of introducing it into the professional training of future teachers.

Keywords: self-education, competence of self-education, information and educational environment, technology, future teacher.

Олеся Кисельова «Технологія формування компетентності самоосвіти в майбутніх педагогів у сучасних умовах».

У статті висвітлено актуальність однієї з нагальних проблем сучасної педагогічної освіти. Формування нового покоління вчителів, здатних до самоосвіти впродовж життя, набуває особливого значення в сучасних умовах, пов'язаних із динамічним розвитком інформаційного суспільства, а також у ситуації поширення пандемії короновірусу та тривалого воєнного стану в Україні. Автором визначено суть поняття «самоосвіта майбутнього педагога», виокремлено етапи здійснення самоосвіти. Презентовано суть компетентності самоосвіти майбутнього педагога в умовах відкритого інформаційно-навчального середовища та її структурні компоненти: мотиваційно-ціннісний, організаційний, процесуально-інформаційний та контрольно-рефлексивний. Із погляду системного підходу схарактеризовано складові компоненти компетентності самоосвіти. Описано суть та дидактичні функції інформаційно-навчального середовища, продемонстровано їх вплив на самоосвітній процес здобувачів. Акцентовано увагу на його розвитку як стрижневого чинника формування компетентності самоосвіти майбутнього педагога. Виокремлено аспекти трансформації самоосвітньої діяльності майбутнього педагога в умовах сьогодення. Запропоновано інтернет-сервіси

для розвитку самоосвітньої компетентності, а також з'ясовано переваги наявних освітніх платформ для самоосвіти майбутніх педагогів. Автором обґрунтовано технологію формування зазначеної компетентності в майбутніх педагогів у процесі їх професійної підготовки за сучасних умов, схарактеризовано підходи, напрями та керівні принципи, дотримання яких актуалізує досягнення позитивного результату її впровадження. Представлено результати експериментальної апробації розробленої технології в закладі вищої освіти, які засвідчують її ефективність та доцільність запровадження в професійну підготовку майбутніх педагогів.

Ключові слова: самоосвіта, компетентність самоосвіти, інформаційно-навчальне середовище, технологія, майбутній педагог.

Relevance of research. The epigraph to this study can be the words of Stanislas Dean, a French writer and cognitive neuroscientist, a researcher of numerical cognition, the neural basis of reading, and the neural correlates of consciousness: «We are not just Homo sapiens, we are Homo docens, a species that teaches itself» [19].

The modern world is characterized as the VUCA world – an abbreviation for Volatility, Uncertainty, Complexity, Ambiguity. The speed and unpredictability of changes, the rapid development of science and technology, the shortening of the validity period of knowledge, the loss of demand for many traditional professions and the emergence of new ones force a person to constantly acquire new knowledge, from time to time to reorient himself to a new profile of activity. The ability to self-educate becomes a decisive factor for the successful self-realization of a person. E. Moren, researching modern man and society from the perspective of the paradigm of complexity, claims that education is «a force for the future», one of the most powerful tools that enables us to respond to the challenges of an increasingly complex, changing, unpredictable world, and this leads to the need for changes in education [19, p. 1].

Characterizing these changes, we note that, firstly, the understanding of education has acquired a new meaning: today education appears as a continuous process that continues throughout life. Secondly, information globalization, the possibility of instant access of a person to a variety of educational sources, the

appearance of open mass online courses, thematic webinars, master classes, etc. – all this collectively actualized various ways of acquiring education. The Law of Ukraine on Education states: «A person exercises his right to education throughout his life through formal, informal and informal education. The state recognizes all these types of education, supports subjects of educational activity that provide relevant educational services, and also encourages the acquisition of all types of education». A person takes over the educational initiative, becomes an active subject of education, most interested in the high quality of educational results and at the same time most responsible for these results.

Currently, the concepts are widely used in pedagogical literature «competence», «competency», but their distinguishing features are not clearly marked, which sometimes leads to considering them as synonymous. However, these concepts are complementary and exist independently, which is important to take into account organization of competence-oriented training. The analysis of the literature allows us to conclude that today the phenomenon of professional competence is not stably defined. Competence is considered as professional literacy, the degree of qualification of a specialist, as the level of development of a person's personality and culture. M. Shalashova by competence he understands the integral quality of the personality, which characterizes the readiness to decide problems that arise in the course of life and professional activity, using knowledge, experience, individual abilities [14].

Researching the urgent problems facing higher pedagogical education, G. Ponomaryova emphasizes the need to find the most effective ways, methods and technologies of preparing students for the realization of the new mission of a teacher in modern conditions [13, p. 5]. After all, the professional capacity, authority and effectiveness of a teacher's activity depend on his ability to independently and systematically expand his horizons in the chosen subject area, to master innovative methods and technologies of teaching, to master the latest professional tools.

The integration of Ukraine into the single European space, the dynamic development of an information society open to all and focused on people's interests, the convergence of national education with the world one, the constant growth of the volume of information require the improvement of the process of professional training of a new generation of personnel. There is an urgent need for highly mobile, proactive, competent teachers who are capable of continuous self-improvement, broadening their horizons, and mastering new high-tech professional tools through continuous self-education activities throughout life using the latest forms and relying on electronic information resources and educational resources of the network. Internet regarding the implementation of social, personal and professional functions. This ability is of particular importance for all specialties without exception, since the success of any professional activity directly depends on the ability to independently acquire knowledge and skills, improving one's competence in the chosen field. In addition, the trends in the development of higher education are characterized by the transfer of emphasis from educational activities to self-education, lead to the growth of the role of independent work of students in their professional development, informatization of the educational process stimulates both the improvement of teaching technologies and the renewal of forms, methods, techniques and means of self-education.

So, one of the urgent tasks of the modern system of pedagogical education is the formation of future teachers' readiness and ability to effectively carry out self-education using latest forms relying on electronic educational and informational resources and educational resources of the Internet for the purpose of continuous self-improvement regarding the realization of social, personal and professional and pedagogical functions.

Analysis of recent research and publications. In the works of many modern researchers (I. Zimnia, O. Ovcharuk, O. Pometun, J. Raven, S. Rakov, S. Shishov, A. Khutorskyi and others) the competence approach is actively discussed as one of the leading directions for improving the national education system. In the works of M. Bondarenko, G. Kojaspirova, O. Malikhin,

I. Naumchenko, M. Rogozina, N. Sydorchuk, N. Tereshchenko, V. Shpak and others, current problems of self-education are highlighted. The growing role of self-education in the information society was highlighted by A. Andreev, V. Korvyakov, V. Nadein, E. Polat, G. Serikov, M. Soldatenko, O. Shuklina and others, the use of information technologies as a means of self-education was considered by E. Ganin, Yu. Kalugin, S. Yashanov and others.

Self-educational competence is one of the most relevant competences that must be formed in future specialist in the educational process of institutions of higher education. Modern research in recent years is dedicated to the formation of self-educational competence in students (V. Haida, I. Maistryuk, S. Osipenko, and others), specialists of various specialties (N. Dovmantovych, N. Horuk, S. Kasiyants, Yu. Sabadosh, V. Ternopolska, N. Oliynyk, T. Voloshina, and others). Particular attention is paid to self-education as a means of developing the professional competence of a teacher (N. Borisenko, O. Vnukova, V. Denysenko, A. Pomazan, I. Sabatovska-Frolkina, V. Fesenko, T. Khlebnikova, I. Hrytsenko, and others).

In studies devoted to the problem of formation of self-educational competence of specialists of various fields training (N. Voropai, T. Voloshyna, O. Nozhovnik, M. Soldatenko, E. Spivakovska-Vandenberg, V. Ternopilska, etc.) consider psychological, organizational-methodical, content-targeted, resource conditions for optimizing the educational process, as well as questions motivational, procedural and technological support of subjects of the educational process. Analysis of scientists' works shows that the formation of self-educational competence of future specialists is based on a motivated attitude students to cognitive and research activities, reflexive readiness of teachers and students, designing an educational and scientific environment that simulates future professional activity.

The COVID-19 pandemic on the educational process also added its corrections when there was an urgent need to make flexible decisions to enable students to implement their educational needs. Thousands of students during

suspension of the educational process in the offline mode, one has to transform one's own homes for classrooms, but, unfortunately, not always education seekers have free access to the Internet as needed, therefore self-educational student activity is an important factor in training a modern specialist for changes in teaching higher education during the pandemic [7].

According to the indicators of the freely available full-text scientific publications search engine Google Academy, the number of works on the subject, devoted to various aspects of the concept of «self-education competence», has been steadily growing over the past 10 years (Fig. 1). However, in 2021-2022, there is a certain crisis regarding the study of this pedagogical phenomenon. The spread of the coronavirus pandemic, the cynical military invasion of the aggressor country on the territory of Ukraine, and the martial law have made adjustments in all areas of people's lives, including teachers and scientists.
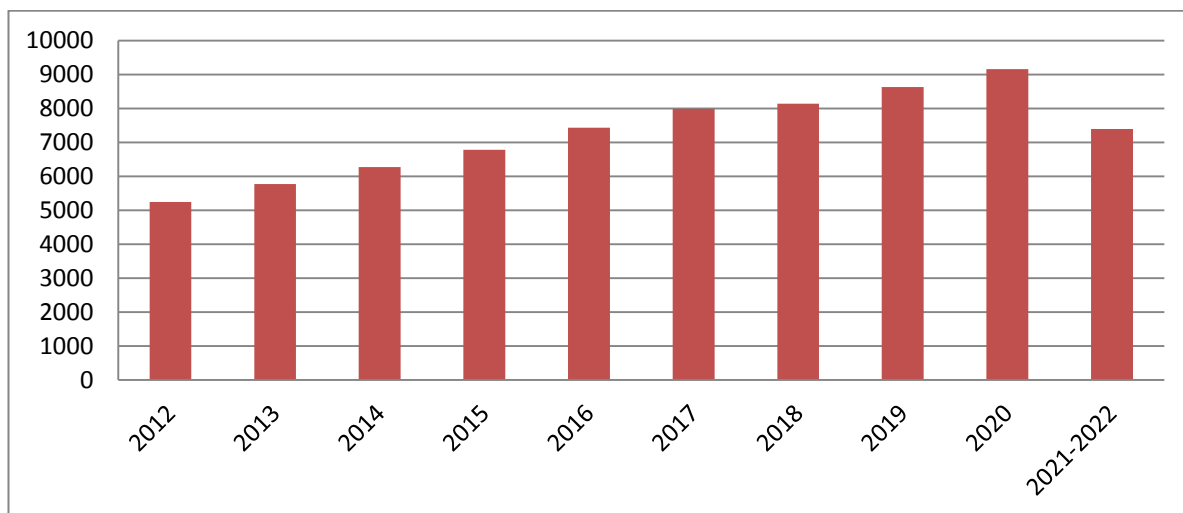
Fig. 1. Dynamics of publications in Google Academy

on the subject of «self-education competence»

However, the existing pedagogical practice shows that students' self-educational skills are insufficiently formed, their unwillingness to fully use the educational potential of the modern informational and educational environment. One of the important reasons for this state of affairs is the lack of special attention to the specifics of students' self-educational activities in the conditions of open access to non-traditional sources of information, the implementation of support

for professional training using the capabilities of Internet services that expand the information support of the educational process, sources of consulting assistance, etc.

The following aspects of the outlined problem require attention: analysis and introduction into the system of domestic higher pedagogical education of innovative experience in preparing future teachers for self-education; the search for ways of forming the skills and abilities of such activities that are adequate to the requirements of the time on the basis of the competence approach; scientific substantiation, development and creation of didactic and methodological support for the technology of self-education competence formation among students of pedagogical specialties in the process of their professional training.

The purpose of the article. The purpose of this article is to clarify, based on the analysis of the works of scientists and my own experience, the technology of forming the competence of self-education in the future teacher in modern conditions.

Presenting main material. Lifelong learning, formal education, informal, informal (self-education) education play an increasingly important role in the acquisition of skills and the skills needed to provide social and economic activity. Informal education (self-education) it is an education that assumes self-organized acquisition by a person certain competencies, in particular during daily activities, related to professional, public or other activities, family or leisure. State policy in the field of higher education is based on the principles of promoting the sustainable development of society by preparation competitive human capital and creation of conditions for education throughout life, expanding opportunities for acquisition higher education and lifelong learning.

Transferring the problem of forming the competence of self-education of the future teacher into the field of practice of professional training necessarily requires a preliminary solution of a number of theoretical questions, such as clarifying the essence of self-education, determining the characteristics of self-education at the current stage of informatization of society, identifying the

totality of those knowledge and skills, the acquisition of which ensures success self-education, justification of methods of their formation.

The application of the competence approach in the training of specialists requires from teachers sconstant self-improvement, creative work, skills and the desire to analyze your teaching experience, to make the educational process the subject of one's research, to constantly update the arsenal of methods and techniques of pedagogical activity [17].

In order to identify significant differences that distinguish self-education from other, related concepts, for example, independent work, we have systematized its characteristic features: independence, voluntariness, self-directedness, focus on satisfying cognitive needs and interests, continuity. The theoretical search for the above-mentioned features is based on the analysis and comparison of the main parameters of self-education and independent educational activities of students (Table 1.1), which allows us to better understand the interdependence and mutual influence of both processes, to approach the choice of means and methods of effective formation of self-education competence in students more objectively [14].

Table 1.1

Comparison of independent and self-educational activities of students

Comparison parameters	Activities of students	
	Independent	**Self-education**
Goal	determined by the teacher	determined by the student himself
Place	leading	additional
Motives	socially significant,	socially significant
Nature	educational	subjectively significant
Content	mandatory	voluntary
The nature of management	the teacher determines the sources, methods of work, its scope; the teacher manages the work, monitors, adjusts, corrects	personality determines the sources, methods of work, its scope
The results	the results of the work are evaluated by parents, the public, and the student himself	the results are evaluated by the student himself, the team
Organization	is organized by the teacher as a collective, individual	organized by individuals, groups, associations of students as individual, group, collective

Self-education of the future teacher is a voluntary, independent individual cognitive activity, guided by the individual himself and aimed at continuous self-improvement in the implementation of social, personal and professional-pedagogical functions. Analysis of the results of research by scientists (M. Bondarenko, I. Grabovets, A. Gromtseva, I. Kaloshina, O. Malikhin, G. Syerikov, N. Tereshchenko, V. Shpak, etc.) made it possible to structure the content of self-education and determine the stages with corresponding steps its implementation: *goal setting, planning, organization, implementation, reflection* (Fig. 2).
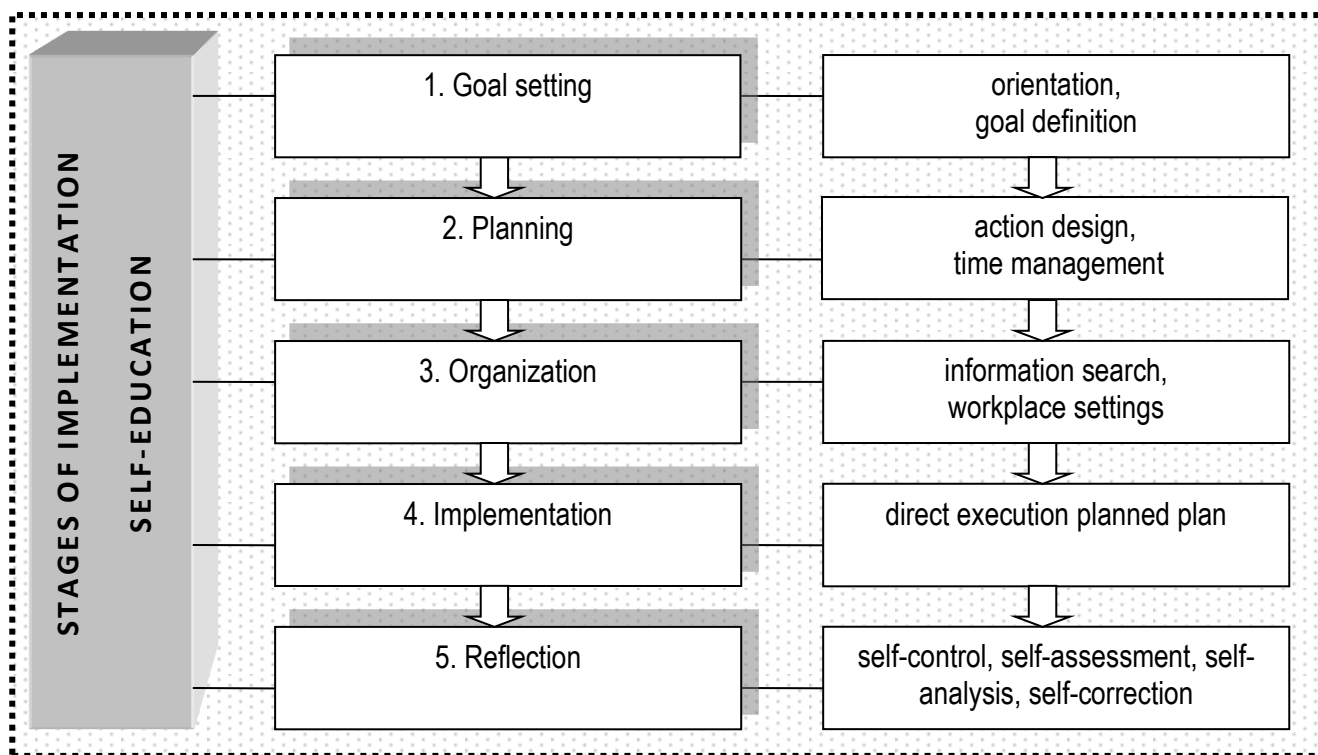
Fig. 2. Stages of self-education

The goal-setting stage involves the following basic steps: orientation and goal definition. On the basis of orientation (self-knowledge, self-accounting, self-determination, self-motivation), the goal of self-improvement of knowledge, methods of activity, certain qualities is determined, while the final result and the means by which it can be achieved are necessarily foreseen. In addition, the goal is considered accepted if the student clearly understands where the results of efforts

will be practically used, in which aspects of his activity he can apply what he has learned in the process of self-education. In our opinion, goal setting, the ability to develop and to carry out self-education programs taking into account personal and social needs is one of the most important for the effective implementation of self-education by a future teacher.

The planning stage is a personal design of specific actions aimed at improving knowledge, skills, certain qualities through self-education, as well as time management. Design involves the development and specification of certain steps of activity, first of all, the selection of sources of necessary information and means of achieving the final goal. Equally important is the ability to rationally allocate time, which contributes to the economical use of resources and, at the same time, the effective resolution of assigned tasks.

The organization stage consists of searching for the necessary information and workplace settings. Search is an important element of self-education and direct work with sources of information based on the ability to work independently in the library, on the Internet, to use new information and communication technologies to meet self-educational needs, to be critical of any information received. The organization of the workplace should be rational, since failure to meet elementary requirements leads to a decrease in the stability of attention, rapid fatigue, dissatisfaction with the process of self-education, and to the deterioration of the quality of work.

The stage of implementation means the direct implementation of the planned plan for self-improvement of knowledge, methods of activity, and certain qualities by means of self-education. At this and the previous stages, quite important skills are information-search (search, selection of information, its use to obtain new knowledge), information-analytic and technological based on the rational use of information and communication technologies.

At the stage of reflection, the individual becomes aware of the result he achieved in the process of self-education. Its implementation involves self-control, self-assessment, self-analysis, and self-correction. During the cycle of self-

education, the student monitors its course, evaluates its quality, determines the strengths and weaknesses of the work based on a comparison of the acquired with the planned. The ability to be critical of one's work is necessary for an adequate evaluation of the obtained results. If, after assessment and analysis, the individual concludes that the planned tasks are performed poorly, it is necessary to set a mini-goal for the correction of self-education actions. Reflective skills consist of self-reporting on the effectiveness of work, development of new tasks for the next cycle of self-education, determination of directions for its improvement. The result obtained under such a scheme of work indicates that the individual coped with the tasks set, achieved his goal, thus contributing to his own self-improvement.

It should be noted that at all the specified stages, the emotional and volitional mechanism for overcoming insecurity, laziness, difficulties during self-education, the presence of value orientations and motives for its implementation is of great importance [3]. It is natural that in order to successfully and effectively pass each stage of self-education, a person must possess certain abilities, skills, qualities, etc.

Innovations in the educational environment, the penetration of information and communication technologies into education contributed to the emergence of a qualitatively new information and educational environment, in which these technologies are used to support independent cognitive activity, the implementation of connections between participants in the educational process and access to global educational information resources (A. Veryaev, S. Leshchuk, V. Lyskova, O. Mukoviz, O. Rakitina, Yu. Ramskyi, M. Umryk, I. Shalaev, and others). It is a multifaceted holistic, socio-psychological reality, which provides a set of necessary psychological and pedagogical conditions, modern learning technologies and programmatic and methodical learning tools, developed on the basis of modern information and communication technologies, which provide support for cognitive activities and access to information resources (V. Krasilnikov); a set of conditions that contribute to the emergence and development of the processes of information and educational interaction between

those who study, the teacher and the means of new information technologies, as well as the formation of cognitive activity, provided that the components of the environment are filled (various types of educational and demonstration equipment, software tools and systems, educational-visual aids, etc.) with the subject content of a specific educational course (S. Honcharenko); a set of conditions that ensure the learning process due to the presence of a system of means of «communication» with universal human culture, which serves both for storing, structuring and presenting accumulated knowledge, as well as for their transfer, processing and enrichment; a system of independent work on information processing, intensive communication ties between the participants of the educational process – both vertical and horizontal.

The modern informational and educational environment contains informational, organizational, program-methodical, communicative, control and evaluation components and performs the following didactic functions: instructional-organizational, informational-cognitive, communicative and control-coordinating (L. Bilousova, A. Veryaev, O. Pozdnova, E. Polat and others). In our work, we understand the *information and educational environment* as a qualitatively new systemically organized educational space, focused on the use of information and communication technologies to support independent cognitive activity, free access to global information resources for educational purposes, and the implementation of active connections between participants in the educational process [1].

Taking into account the ways of using the potential of the modern information and educational environment, we will single out the *transformation of the self-education activity of the future specialist* in today's conditions:

• openness and dynamism of the information space of self-education (the availability of the global fund of educational information, which is not permanent, is constantly updated);

• expansion of forms of self-education activity (independent learning of electronic courses, thematic Internet resources, participation in virtual

professional communities, mass open distance courses (MOOC), web projects, webinars, Internet communications of a professional direction, etc.);

• absence of time and territorial restrictions on its implementation (use of a global computer network);

• variability of self-educational electronic educational and information resources (diversity by professional purpose, orientation to a certain category of users, method of presentation, etc.);

• indirectness of access to Internet sources (the specifics of finding them using information and search systems);

• availability of additional opportunities for self-monitoring (use of automated, in particular online, control and diagnostic tools to assess one's own level of assimilation of educational information) [8].

The above-mentioned features significantly affect the set of those skills, which ensure the effectiveness of the future teacher's self-education.

In order to determine the role of IEE in the self-education of an individual, we will consider its didactic functions. IEE, on the one hand, is a part of traditional education, and on the other – an independent system aimed at developing active creative self-activity of students using information technologies. The educational and informational environment implements adaptive, developmental, educational and activating functions]. Based on the above research, we specified the following didactic functions of IEE: instructional-organizational, informational-cognitive, communicative, and control-coordinating (Fig. 3). Let's consider each of them in more detail in the context of self-education of a student of institution of higher education.

One of the means of supporting the self-educational activities of future teachers is the use of modern Internet resources, which are defined as a set of integrated software, hardware and technical means, as well as information intended for publication on the Internet and information in certain textual, graphic or sound forms [1]. The use of Internet services at its various stages deserves special attention. So, when defining goals and planning self-educational activities, students

have the opportunity to use: mindmap creation services (Bubbl.us (https://bubbl.us), MindMeister (https://www.mindmeister.com/ru), Cacoo (https://nulab.com/cacoo/), Lucidchart (https://www.lucidchart.com/pages/), Mindomo (https://www.mindomo.com/ru/), Google calendar (https://calendar.google.com/calendar/u/0/r)), etc.

Didactic functions of the IEE

instructional and organizational	informational and cognitive	communicative	controlling and coordinating
● provision of complete information about the order and conditions of organization of the educational process; Forms and schedule of control, reporting terms, subjects of Individual scientific and research task; ● · access to discipline	● multi-level presentation of educational material (courses of lectures, electronic textbooks, handbooks, manuals, links to Internet resources); ● scientific and clear presentation of information, interactivity of e-learning tools.	● implementation of the possibility of receiving operational consulting assistance; ● exchange of information; ● cooperation with the teacher and other participants of the educational process.	● availability of a system of control tasks for self-certification; ● built-in means of automated testing; ● open access to the electronic journal (rating).

SELF-EDUCATION

electronic reference books, encyclopedias, dictionaries, textbooks, educational courses, educational catalogs of literature and educational

programs of educational disciplines, sets of individual tasks, topics of scientific research, term papers, etc., schedules of the

training systems, means of knowledge control and rating assessment of current results of educational activities, etc.

means of computer communications, etc.

electronic workshops, instructional materials and recommendations; subject-oriented and professionally oriented software environments, tools of universal information technologies, etc.

informative	organizational	control and evaluation	communicative	program and methodical

Components of IEE

Fig. 3. The influence of constituents and didactic functions of IEE on self-education

It should be especially noted as a tool for the management of any activity, task, in particular of a self-educational nature, the Gantt chart, where the graphic

presentation of the project plan and work schedule is a display of tasks in the form of segments on a time scale, which allows you to assess the sequence of tasks, their relative terms and duration as a whole, and compare the planned and actual progress of tasks. The following services will be appropriate for this:

•SmartSheet «smart table» (https://www.smartsheet.com);

•Realtimeboard (www.realtimeboard.com);

•Gantter for Google Drive (https://www.gantter.com).

In order to strategically plan their own self-education, students can use the SWOT analysis method popular in management, which consists in identifying the factors of the internal and external environment and dividing them into four categories: Strengths (strengths), Weaknesses (weaknesses), Opportunities (possibilities) and Threats (threats), and the following services will help in this: Gliffy (http://www.gliffy.com/), Realtimeboard (www.realtimeboard.com), etc.

The effectiveness of the organization and implementation of self-education activities of future specialists on the Internet is achieved by the correct implementation of certain steps: searching for sources of information, respectively to the assigned educational tasks; selection and primary processing of information; processing of various formats of information and decision-making on its basis; creation and presentation of information products. So, in order to find and save the necessary information, it is advisable to use:

•search engines (Google, etc.);

•services for storing the necessary pages (Symbaloo (http://www.symbaloo.com), Diigo (https://www.diigo.com/), Evernote (http://evernote.com), So.cl (http://www.so.cl), etc.);

•electronic libraries (http://kultura.ho.ua/biblioteka.htm), (https://sites.google.com/site/osvitnires/elektr-biblioteki), etc.).

In addition, future teachers have the opportunity to independently master electronic courses, in particular distance, MOOCs [13], participate in virtual communities (http://klasnaocinka.com.ua, http://disted.edu.vn.ua), web-projects, webinars, Internet communications of a professional direction, etc.

The last stage, reflection, is supported by online control and diagnostic tools for assessing one's own level of assimilation of educational information (HotPotatoes (http://hotpot.uvic.ca), MyTestXPro (http://mytest.klyaksa.net/), ClassMarker (http://www.classmarker.com), Webanketa (http://webanketa.com), etc.).

Quite important Internet services for the formation of both motivation and self-assessment skills of students are problem boards: Realtimeboard (www.realtimeboard.com), Trello (https://trello.com), Symphonical (: https://www.crunchbase.com/organization/symphonical).

It is quite traditional to use online services for organizing self-education of general purpose. So popular Google services can be used for communication (G-mail), saving and file sharing (Google Drive), activity planning (Google Calendar), creating your own questionnaires (Google Forms), creating and working with documents (Google Docs), etc. [1010].

As the scientists note, the development, improvement and spread of information and communication technologies had a significant impact on all components of the educational process and, in particular, on changes in teaching tools: the use of electronic resources forms the image of modern education [15].

Teachers and students at lessons electronic textbooks and manuals are increasingly used, simulators, encyclopedias, handbooks, computer games educational destination, etc. The specified resources in general and, particularly, Internet resources can be effectively used for the organization of self-education of teachers.

During the formation of self-education competence of the future teacher, it is necessary to take into account the modern conditions of the educational space: combination traditional methods of promotion qualifications (formal education), courses, seminars and other measures, which allows you to quickly get required knowledge and skills (non-formal education) and informal (self-education), which helps to increase your professional level; using computer and the Internet; online courses that allow you to watch videos lectures by well-known specialists

from various fields of knowledge, check your knowledge with the help of testing, communicate with each other.

In order to form the competence of self-education, it is worth paying attention to the possibilities of *educational platforms* on the Internet. First of all, there are many Internet resources for remote training (online courses, schools, clubs, etc.). So, for example, on the *Prometheus platform* (https://prometheus.org.ua/) hosts online courses from leading teachers of institutions of higher education of Ukraine from the cycle free preparation for external examinations, studying programming, speaking English, etc. After studying the material, it is possible to take an online test and receive a certificate approved by the course instructor [1010].

Future teachers have the opportunity to constantly improve their qualifications, grow professionally by studying at distance courses, webinars and master classes, etc. In addition to the platforms mentioned above, there are various sites on the Internet for self-education and exchange of experience between educational workers:

•Education.UA: Education in Ukraine and abroad (http://osvita.ua/);

•Distance Academy «ОСНОВА» (https://osnova.d-academy.com.ua/);

•Integrated educational platform (https://sites.google.com/view/osvitaplatforma/);

•Online platform of non-formal education in Ukraine (https://learnlifelong.net/course/platforma-google-resurs-dlya-osvityan/);

•Teacher's journal online (http://teacherjournal.in.ua/);

•School life (https://www.schoollife.org.ua/);

•«Academy of Innovative Development of Education» («AIPo») (https://www.airo.com.ua/);

•Distance Academy TeachHub (https://teach-hub.com/);

•EdPro (https://edpro.ua/);

•Continuous learning portal CyXaPi (https://sukhari.com.ua/);

- Pedrada – a portal for educators of Ukraine (https://oplatforma.com.ua/);

- Digital publishing house Expertus (https://seminar.expertus.com.ua/);

- Educational portal Super Urok-UA (https://super.urok-ua.com/);

- Udacity (https://www.udacity.com/);

- iTunes U (https://www.apple.com/education/k12/);

- Udemy (https://www.udemy.com/);

- ВУМ (https://vumonline.ua/);

- Online platform «Дія. Цифрова освіта» (https://osvita.diia.gov.ua/);

- Training center СУТО ПРО (https://pro.suto-tc.com/) etc.

The Internet is full of reference resources for school subjects. For example, video lessons on all school subjects (All-Ukrainian online school of the Ministry of Education and Culture (https://lms.e-school.net.ua/); the UMITY educational platform (https://umity.in.ua/?ref=25) contains a selection educational and demonstration videos on various topics (physics, chemistry, mathematics, biology, etc.), online museums, art, cultural, scientific centers. For example, on the website Virtual tour of museums of the world (https://lib.if.ua/publish2009/1249300238.html) presented museums of the world, which are spiritual treasuries that store priceless monuments history, culture and arts. Visitors are offered a webliographic list – a list of addresses of electronic resources of well-known museums the world and Ukraine. There are many subject online environments, simulators, virtual laboratories. It is especially useful and accessible to use Physics Simulations (https://www.myphysicslab.com/) – interactive simulations, physics simulations, animated in real time, with which you can interact. In the self-education of students, we can use online simulators, interactive exercises, didactic games, etc. So, for example, the online simulator «Mathematical box» (https://matematuchnas.blogspot.com/p/blog-page_20.html) contains a set of didactic interactive exercises, a training ground for strengthening and improving your knowledge. Project «Puzzles in Ukrainian»

(http://rebus1.com/ua/index.php?item=logichni_igry) offers rebuses and various logic games for schoolchildren of different age categories [10].

According to a survey of practicing teachers, the most popular platforms are: educational project «НаУрок» (https://naurok.com.ua/journal), portal «Всеосвіта» (https://vseosvita.ua/news), Academy of Digital Development (https://www.digitalacademy.in.ua/), «Освіторія» (https://osvitoria.media/), EdEra *platform* (https://www.ed-era.com/) and Edway (https://edway.in.ua/uk/mpk/list/). Example, *Edway* (https://edway.in.ua/uk/mpk/list/) is an educational companion, a «compass on the educational paths of growth», always ready to provide digital and information technology support in the process of improving the qualifications of pedagogical workers. And it is also an environment in which everyone who strives for the development of Ukrainian education will be able to gather: those who provide educational services in the field of professional development, and those who need these services [5]. *The EdEra platform* (https://www.ed-era.com/) contains qualitatively new online courses in the Ukrainian language. There are lectures on various topics: the Ukrainian language and literature, 3D modeling, studying the basics of human rights, etc. Courses are free, created by young specialists in various fields [10].

Future teachers should also pay attention to foreign online platforms for self-education. Example, *Coursera* (https://www.coursera.org/) is the project, which, without exaggeration, changed the perception of online learning. Coursera was founded by two computer science professors from Stanford University, Andrew Ng and DaphneKoller, in 2012. In 2016, Coursera began to introduce monetization on its platform - it made paid certificates, and then also introduced a fee for completing tasks in some courses. There are still completely free courses left on Coursera, so if you are not ready to pay, then there is also an opportunity to choose something useful for yourself (https://www.classcentral.com/report/coursera-free-online-courses/).

EdX (https://www.edx.org/) – is a platform for open interactive courses founded by the Massachusetts Institute of Technology and Harvard University.

There are free and paid courses on EdX. It all depends on the program and which university prepared it: the course may include paid certificates or paid educational materials.

Khan Academy (https://uk.khanacademy.org/) is a non-profit educational organization founded in 2006 by educator Salman Khan to provide «high-quality education for anyone, anywhere». The organization creates lectures in the form of YouTube videos. In addition to micro-lectures, the organization's website has practical classes and methodological materials for teachers. All resources are available for free to everyone. The idea to found the «Khan Academy» came to the American Salman Khan (SalmanKhan), when he was helping his cousin with mathematics. The platform is very open - it does not even require registration. You just choose the course you like, read its description and you can start studying right away. Since Salman Khan himself is well-versed in mathematics, computer science and engineering, KhanAcademy has many training programs on these subjects [5].

Self-educational competence is an integrative personal property, which is provided by emotional and valuable attitude to self-development and self-educational activity, a system of knowledge about planning and implementation of self-education activities, about methods of self-education, subject-personal experience of productive solutions to development problems, development and implementation of models of student preparation for self-education, readiness for continuous self-development of professional qualities, self-improvement, self-education in the field of the future profession. Of this kind competence is based on the experience of self education as a mechanism of personality development [14].

From the perspective of deepening the understanding of the essence of the concept of «self-education competence», the definition of self-education competence as «the readiness of an individual for independent, systematic, purposeful knowledge of reality, mastering the social experience of humanity, aimed at self-realization, self-development» deserves attention; «readiness and ability of the individual for self-educational development, independent self-

creation» (N. Kubrakova, N. Kovalenko). Based on the analysis of scientific literature (N. Bukhlova, N. Kovalenko, I. Orlova, I. Preobrazhenska, A. Radchenko, and others) we substantiated the essence *competence of self-education of the future teacher in the conditions information and educational environment* as a whole multicomponent professional and meaningful personal formation that reflects unity readiness and ability to effectively carry out self-education with using its newest forms and relying on electronic educational information resources and educational resources of the Internet with the purpose continuous self-improvement regarding the realization of social, personal and professional and pedagogical functions [1, p. 60].

Considering self-educational competence from the standpoint of a systemic approach, it is possible to highlight the following properties:

•integrity (self-educational competence is a holistic entity that reflects personal qualities, while its components are functionally interconnected and cannot develop independently);

•non-additivity (properties of self-educational competence as a system are not equal to the simple sum of the properties of its subsystems, and its functioning cannot be reduced to the functioning of individual component subsystems);

•systemic embeddedness (self-educational competence is a complex system that is a subsystem of a more complex biological system – a person);

•goal orientation (the system-forming factors of the formation and development of self-educational competence are the goals of professional self-determination of the individual);

•controllability (the degree of formation of self-educational competence as a system is determined by the regularities of purposeful and optimal self-management arising from the needs of the individual, including in professional self-determination);

•the stability of self-educational competence is determined by the stability of its components, the regularities of its development in the context of the formation and development of the personality [16].

Let's consider the *structure of the concept of «competence of self-education»*.

The motivational-value component reflects the future teacher's awareness of the personal and social value of professional self-improvement, the real possibility of achieving results based on the use of information and communication technologies, the internal need for self-education and positive motivation, a developed emotional and volitional mechanism for overcoming difficulties, etc.

The organizational component provides the ability to determine the goal of self-education (near and long-term), rationally plan it (independently determine the content, sources of knowledge, deadlines for the planned implementation, predict the course and results) and organize (build your own self-educational trajectory, taking into account individual needs and abilities, select adequate forms and methods, to regulate and control time, etc.).

The process-informational component combines the following skills: information-search (the ability to rationally choose information-search systems, effectively use their tools, etc.), information-analytical (the ability to analyze, systematize information, assess its reliability, relevance, etc.), technological (the ability to effectively use means of information and communication technologies for processing, integration of various formats of information, creation of information products, etc.).

The control-reflective component involves the ability of the future teacher to carry out self-control and reflection (analyze, evaluate one's own self-education, adjust and develop new further tasks), including using automated control and diagnostic tools [1].

Summarizing the results of the analysis of psychological and pedagogical research on students' self-education (V. Buryak, M. Rogozina, G. Syerikov, M. Smetanskyi, V. Shpak), we consider it expedient to use a technological

approach as a methodological basis for the formation of self-education competence in future teachers, by means of which it is possible to set the goal of constructing the educational process, starting from the given initial attitudes, and to provide a certain sequence of operations with the use of optimal means, methods of organizing activities and conditions for its implementation.

In the context of our research, the *process of forming the self-education competence of the future teacher* is an interconnected set of measures that ensure the effective implementation of the full cycle of self-education. In order to achieve a positive result, the process of forming the competence of self-education should ensure the following tasks: the organization of educational activities of students aimed at acquiring the competence of self-education; creating conditions for future teachers to have value orientations and positive motives for self-education, needs in the systematic updating and enrichment of professional knowledge; formation of experience of self-education in the conditions of IEE; formation of skills to exercise self-control and reflection of self-educational actions [11].

The specified methodology for the formation of self-educational competence of future specialists in the process of their professional development training in institutions of higher education is implemented in compliance with certain principles:

•the principle of continuity follows from the fact that self-education and self-upbringing are multifaceted and multifactorial processes that cannot be limited by time or age, self-improvement a person is carried out from the moment of birth and continues throughout his life;

•the principle of combining pedagogical guidance with the initiative and self-activity of students. This principle normalizes the position according to which the participants of the pedagogical process are equal partners, take into account the opinion partner, recognize the right to its difference from their own. However, this does not mean that the processes of self-education and self-education students should be out of the attention of teaching staff. On the contrary, the effectiveness of self-education of the future specialists largely depends

on the pedagogical guidance of this process;

• the principle of personification, which involves the creation of an individual style of self-education of a future specialist, when students independently build their own educational route, and the optimal combination regulated and unregulated independent actions of the student is one of the ways of forming his individual style;

• the principle of humanization involves the implementation of the concept, the basic ideas of which are the construction of a pedagogical one systems based on the principles of humanism, ensuring the most favorable conditions for the comprehensive development of the future personality specialists in the process of their professional training at institutions of higher education [14].

We relied on the following guiding *principles*: the motivation of students' self-education should be conscious in nature; the competence of self-education is represented by a certain system of specific abilities and skills, the formation of which requires the use of adequate means that correspond to innovative educational trends, the level of development of modern society, equipment and technologies, including information ones; its formation should be carried out in a system in which assimilation of subject knowledge and mastering of self-educational skills would proceed as a single process; practical actions for mastering self-educational skills should be considered as operations that help the student to rationally carry out all types of cognitive activities.

The technology of self-education competence formation of the future teacher, in our opinion, should be characterized by the following features:

• focus on the formation of this type of competence;

• compliance with the main provisions of the theory of continuous professional education (continuity, transferability, integrability, systematic self-education);

• phasing of implementation;

• organic interrelationship of the content of didactic, psychological-pedagogical, methodological and technological training of the future teacher;

•complex use of forms and methods, application of differentiated, personally oriented, problem-based approaches to formation in the future teacher competence of self-education.

The technology of forming students' self-educational competence should be oriented towards intensive development instrumental skills of self-education and psychological readiness of students not only to acquire new knowledge and to improve what has already been acquired, but also to apply the knowledge, skills and abilities acquired in the process of self-development in practical activity [14]. In the development of the specified technology, we took into account the following factors: *personal* (orientation on the existing level of readiness of students to self-education); *activity* (acquiring one's own experience of self-education in the relevant activity); *holistic* (covering all academic disciplines in their interconnection and interdependence).

During a scientific research, we developed a *technology for the formation of self-education competence of the future teacher*, which is an ordered set of actions, operations and procedures that instrumentally ensure the achievement of the predicted result within the framework of the competence approach, direct to effective future pedagogical self-education in accordance with its features in the conditions of IEE (Fig. 4). The specified technology is included in the system of its professional training in the dialectical relationship of the whole and the part, optimizes the student's self-education experience and provides for the sequential implementation of stages: *propaedeutic, basic and productive*, for each of which a goal and a task are defined. The peculiarity of the developed technology is the continuity of the formation of self-education competence throughout the entire period of training of the future teacher (educational level «bachelor»); sequence and continuity of the process of formation of the studied competence; relying on an activity approach; consistency with training programs. In addition, it can be adapted and applied in general for the training of specialists of various profiles. The goal and tasks of its stages remain, but the professional orientation in the content, the nature of the tasks, etc. is taken into account.

Peculiarities of self-education (SE) in the conditions of IEE

openness and dynamism of the information space of SE,
the expansion of its forms, the absence of time and territorial restrictions on its implementation,
the variability of self-educational electronic educational and informational resources, indirectness
of access to Internet sources, availability of additional opportunities for self-control

The technology of forming the competence of self-education of the

STAGES

PROPAEDEUTIC → **BASIC** → **PRODUCTIVE**

PURPOSE AND TASK

PROPAEDEUTIC	BASIC	PRODUCTIVE
adaptation of students to IEE implemented in higher education institutions, formation of individual skills that are significant for SE:	*initiation of SE, comprehensive formation of SE skills based on the use of ICT:*	*the future teachers' accumulation of subjective experience of SE:*
• arousal of positive motivation of students' SE; • guidance on the use of IEE in self-study; • systematization and deepening of information search and processing skills acquired in the process of general education using ICT; • encouraging self-assessment of one's own knowledge and development of self-control skills.	• promoting students' awareness of the personal and professional significance of SE; • involving them in the preparation of individual programs of SE; • development of a set of information-search, information-analytical, technological skills and the ability to control and analyze the process and results of SE.	• integration of the need for SE with future pedagogical activities; • improvement of SE skills developed at previous stages; • involvement of students in the presentation of the results of the SE; • stimulation to determine directions and ways of further SE.

informative

organizational

control and assessment

communicative

program and methodical

Constituents of

INFORMATIONAL AND EDUCATIONAL ENVIRONMENT

Didactic functions of

instructional and organizational ↔ informational and cognitive ↔ communicative ↔ controlling and coordinating

motivational-valuable / *organizational* / *procedural-informational* / *control-reflexive*

COMPONENTS OF COMPETENCE OF SELF-EDUCATION OF THE

Increasing the level of self-education competence formation of the future teacher
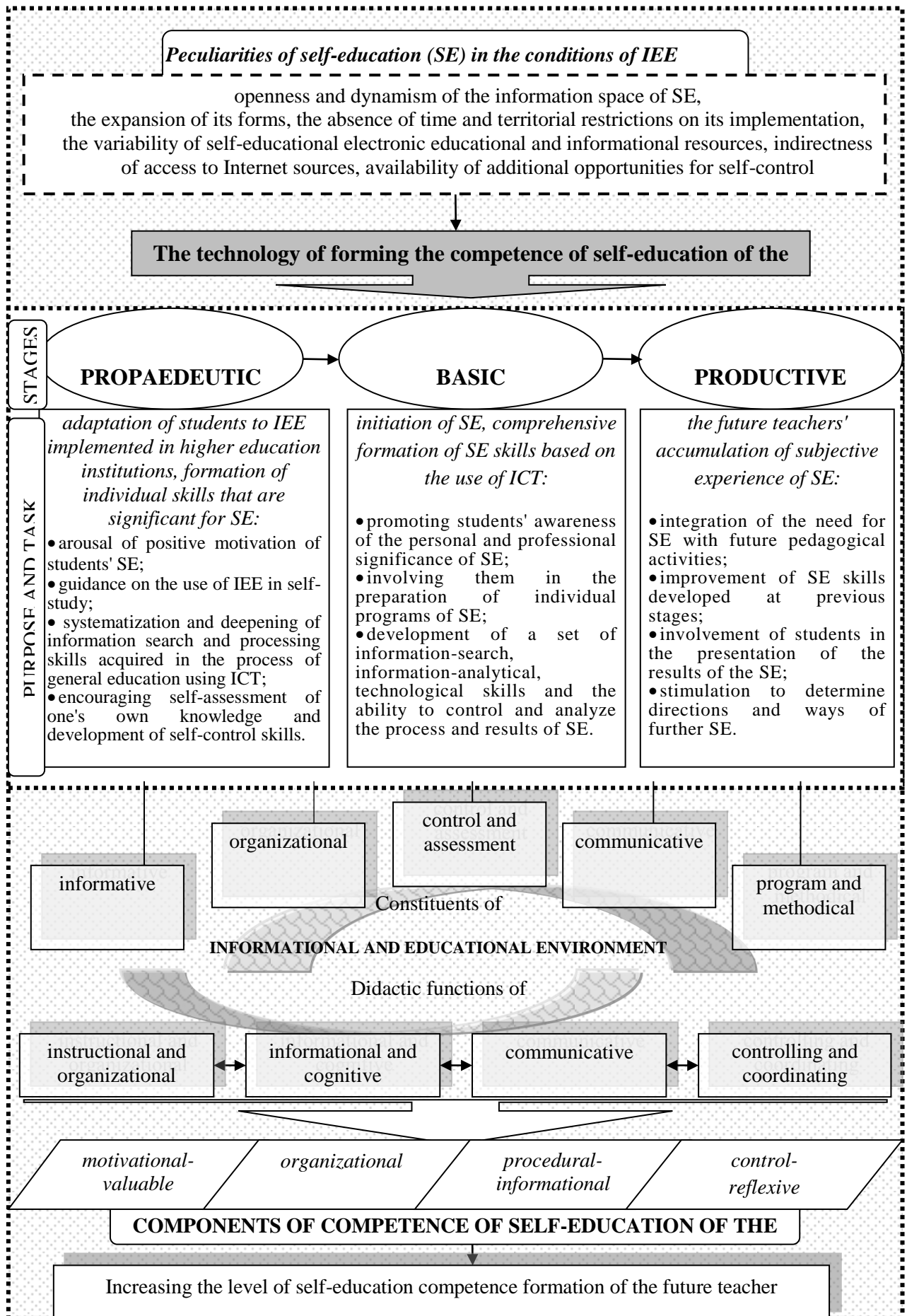
Fig. 4. Technology of formation of self-education competence future teacher

The purpose of the *first, propaedeutic, stage of the technology (I-II course)* is to adapt students to the IEE implemented in an institution of higher education, to form in them certain skills that are significant for self-education. The main tasks at this stage are the stimulation of positive motivation for self-education of students; guidance on the use of IEE in independent learning; systematization and deepening of information search and processing skills acquired in the process of general education using information and communication technologies; encouraging self-assessment of one's own knowledge and development of self-control skills.

The purpose of *the basic stage of the technology (III course)* is to initiate self-education, comprehensive formation of self-education skills based on the use of information and communication technologies. The main tasks are to promote students' awareness of the personal and professional significance of self-education; involving them in drawing up individual self-education programs; development of a set of information-searching, information-analytical, technological skills and the ability to control and analyze the process and results of self-education.

At the productive stage of technology (IV course), the goal is to accumulate subjective experience of self-education by future teachers. The main tasks are the integration of the need for self-education with future pedagogical activities; improvement of self-education skills developed at previous stages; involvement of students in the presentation of the results of self-education; stimulation to determine directions and ways of further self-education [1, p. 71].

Each stage of the developed technology corresponds to a certain content of training, which is provided by educational disciplines in informatics (*«Fundamentals of informatics»*, *«New information technologies»*, *«Modern information technologies»*, *«ICT in professional activity»*), methodological training (*«Methodology of training (professional subject disciplines)»*), as well as the introduction of the special course *«Self-education in the conditions of IEE»*,

trainings (*«Internet in self-education»*, *«Time-management of self-education»*), the scientific circle *«Information space of self-education»*.

Since the investigated competence is the individual's own property, its formation is influenced by the entire educational process, in particular professionally oriented disciplines. The content of the training of future teachers should be built as a comprehensive target program focused on final results, and not as a simple sum of autonomous disciplines independent of each other. Each separate discipline should be considered as an organic part of the integral content of the specialist's comprehensive training.

The technology of forming the competence of self-education of the future teacher provides consistency and continuity in the expansion of the spectrum of IEE tools that the student masters in the process of educational activity:

–at the propaedeutic stage – technological (tools of universal information technologies), control and assessment (automated means of knowledge control and rating assessment of current educational activity results), informational (electronic textbooks, computer training courses);

– at the basic stage – (in addition to those mentioned above) information (handbooks, electronic encyclopedias and dictionaries, electronic catalogs of educational literature, etc.), technological (programs for statistical data processing);

– at the productive stage – (in addition to those mentioned above) organizational and methodical (instrumental pedagogical software tools for evaluating educational achievements, telecommunication technology tools), informational (electronic catalogs of didactic resources on the Internet for educational purposes, etc.).

According to the proposed technology, the competence of self-education of future teachers is formed on the basis of gaining experience of independent attempts and achievements in self-education, the transition from the performance of tasks of a self-educational nature to the emergence of a sustainable need for self-education, the development of an individual self-education trajectory, and its

inclusion in a lifestyle. So, at the propaedeutic stage, the main attention is paid to the formation of the motivational-value, procedural-informational components of the competence of self-education; on the base – the entire component composition; on productive – improvement of the organizational component. At each stage, the activation of students' personal resources, motives and needs is foreseen; the formation of the motivational-value and control-reflexive components of the studied competence takes place. Note that although each stage has a certain focus on the formation of certain components of the studied competence, all its components are interconnected and interdependent, and the development of each of them requires and stimulates the development of others to one degree or another. So, the developed technology is focused on the step-by-step formation of the components of the studied competence with the use of appropriate methods at each of its stages.

Formation of self-education competence of future teachers took place in the following directions:

1. *Projective and prognostic*: self-diagnosis was carried out and diagnostics regarding the existing level of formation of self-education competence among students, their results were discussed with teachers and students, which influenced the further course of the research;

2. *Organizational*: a training program, a special course *«Self-education in the conditions of IEE»,* aimed at stimulating students to acquire self-education competence, was developed; the topics and problems of creative pedagogical projects were drawn up and teachers were introduced to them, their goal determination was carried out in relation to the implementation of the program of experimental work;

3. *Target-based*: students were presented with goals, tasks, and requirements for the formation of the components of self-education competence, the appropriate direction of their activity and activity, stimulation of the setting of personal goals and tasks of professional self-training in the conditions of IEE;

4. *Epistemological*: formation of effective knowledge, abilities and skills of future teachers regarding the content and methods of acquiring self-education competence was carried out by optimizing the content of teaching disciplines in informatics («Modern information technologies», «ICT in professional activity»), methodical training («Methodology of training (professional subject disciplines)»);

5. *Innovative and technological*, in which the main attention was paid to the practical aspects of the formation of the competence of self-education of future teachers in the following areas: the organization of trainings aimed at the development of self-educational abilities and skills, reflection; performance of special tasks; actualization and optimization of self-education of future teachers and its reflection, implementation of projects;

6. *Constructive and creative*: independent practical activities of future teachers are based on practice relevant abilities and skills and examples of self-education in the process of individual educational and research work. The result of independent search activity at this stage was the protection of individual creative projects, public discussion of their results;

7. *Corrective-optimizing* consisted in summarizing the intermediate results of self-education and final diagnosis of the level of self-education competence formation of future teachers, as well as providing individual assistance in designing a strategy for students for their further professional and personal self-development and self-improvement.

Each of the three stages of the refined technology, the formation of self-educational skills was carried out with the help of a specially developed set of tasks, which made it possible to implement an activity-based approach to learning, in which the mastery of certain skills by students occurs in the process of performing actions that require the manifestation of these skills.

At the propaedeutic stage (I-II course), measures were introduced to acquaint students with the information and learning environment implemented in the institution of higher education (in particular, with the existing fund of printed and electronic educational literature, the electronic library catalog, points of access

to the Internet, etc.). During the study of the disciplines *«Modern information technologies»* and *«ICT in professional activity»*), students were offered tasks that are significant for the implementation of individual stages of self-education (draw up a prospectus plan for work on an individual task, roughly allocate time for the implementation of certain fragments of it, etc.), and also aimed at working with Internet sources (create a list of thematic sources or check the relevance of the provided and remove outdated and duplicate links, compare the results of searching for sources using different information and search systems and different forms of requests, find out the peculiarities of using search tools, etc.), on mastering the techniques of integrated processing of multi-format information and others. In addition, attention was paid to the involvement of students in self-testing of educational achievements using automated computer diagnostic systems, in particular online, students' initiative and activity in performing the proposed tasks were encouraged, in manifestations of attempts at self-education.

At the basic stage (III course), a special course *«Self-education in the conditions of IEE»* was introduced, which gave an impetus to the self-education of students: its personal and professional values were revealed, the latest forms available in the conditions of an information society, samples of individual self-education programs from specification of the goal, definition of forms and methods, etc. Within the specified special course, the training *«Internet in self-education»* was held, which included the task of searching for information and analyzing its results with an assessment of the reliability and relevance of the information found, compiling an annotated catalog of thematic Internet sources, working with foreign language electronic resources using systems of automated translation, abstracting of text documents, etc.

At the productive stage (IV course) during the mastery of (*«Methodology of training (professional subject disciplines)»*), students independently set close and perspective goals, defined a problem, searched for and selected the necessary information, evaluated and corrected their actions. Individual educational and research tasks were offered for orientation in the modern professional sphere

(analysis of changes and trends in the programs of educational disciplines, familiarization with new electronic editions of educational and methodical literature, analytical study of the practical experience of innovative teachers based on the materials of their personal web pages, sites of pedagogical forums and open virtual methodological communities, as well as by participating in thematic webinars, Internet conferences, etc.). Future teachers were involved in the independent creation and presentation of individual programs of self-education, sharing the experience of their implementation. The introduced circle *«Information space of self-education»* and training *«Time-management of self-education»* were aimed at improving the ability to rationally plan and organize self-education by performing special exercises on allocating time according to priority tasks, its control, etc.

In order to evaluate the effectiveness of the technology, a pedagogical experiment aimed at its implementation and testing was conducted.

When defining the criteria, the following features were taken into account: objectivity, adequacy, validity, complexity, integrability. Objectivity consists in the fact that the criteria must unambiguously assess the real situation of the object or process at this moment. Adequacy, validity means that the criteria should evaluate exactly what the researcher needs. In our case, it is necessary to study the state of formation of competence of self-education of future teachers. Complexity and integrability are related to the fact that a set of criteria with sufficient completeness should cover all the investigated characteristics of phenomena and processes.

The evaluation of the effectiveness of the formation of self-education competence of future teachers in the process of implementing the developed technology was carried out using a set of criteria (motivational, organizational, information-activity, control-evaluation) that relate to each separate component of the investigated competence (Fig. 5).
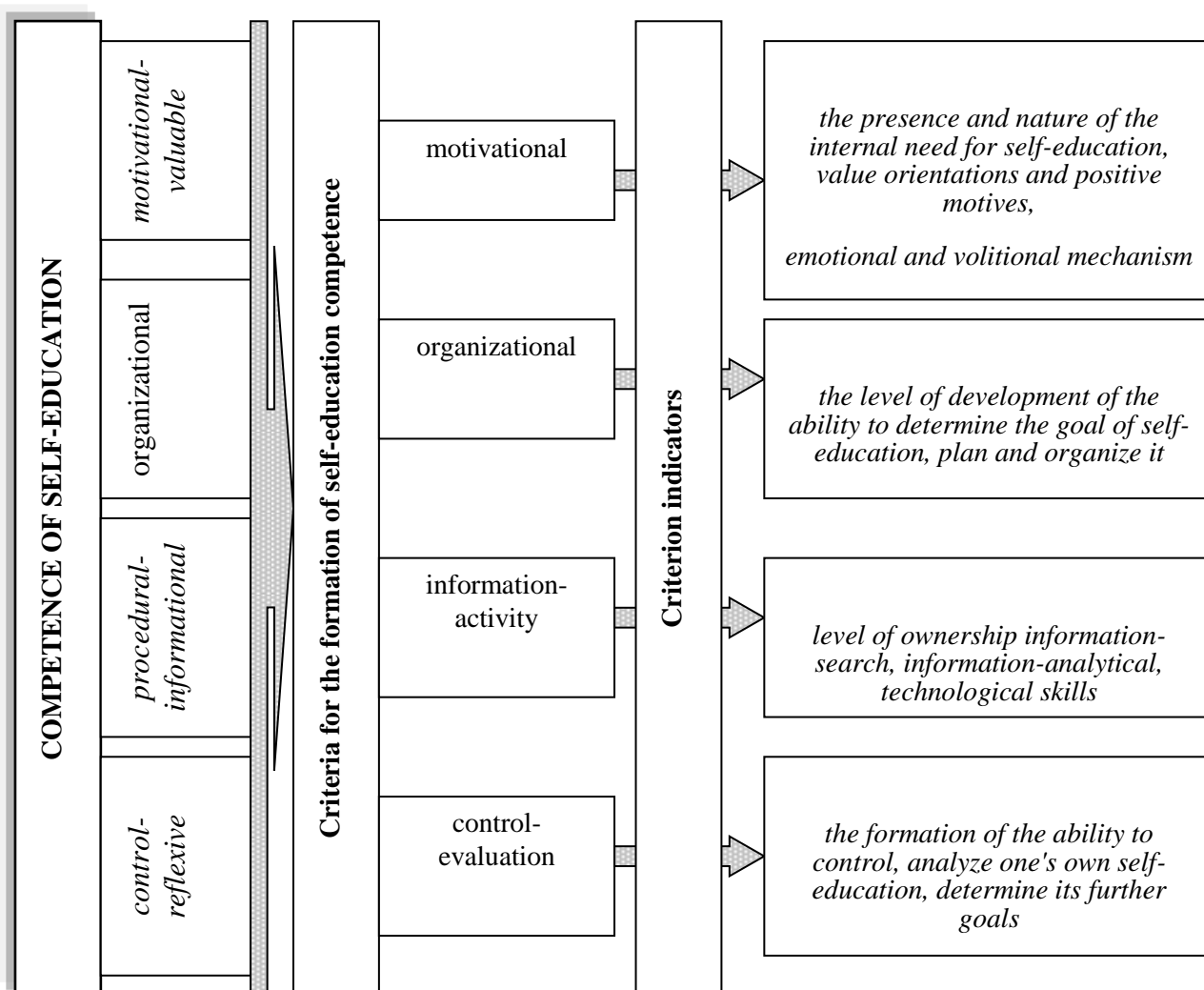
COMPETENCE OF SELF-EDUCATION

| motivational-valuable | organizational | procedural-informational | control-reflexive |

Criteria for the formation of self-education competence

| motivational | organizational | information-activity | control-evaluation |

Criterion indicators

the presence and nature of the internal need for self-education, value orientations and positive motives,

emotional and volitional mechanism

the level of development of the ability to determine the goal of self-education, plan and organize it

level of ownership information-search, information-analytical, technological skills

the formation of the ability to control, analyze one's own self-education, determine its further goals

Fig. 5. Criterion system for assessing the level of formation competence of self-education of the future teacher

The competence of self-education has a tendency to develop. Since the competence of self-education is dynamic, it is manifested and can be evaluated during practical activities, and its level can be continuously increased during the entire professional activity. Next to the classification, there are levels of competence: from «complete incompetence», that is, the inability to cope with the problems and requirements that arise, to «high competence» – competitiveness and talent. Determining the level of formation of self-education competence allows establishing the correspondence between the formed self-education skills of students and the pedagogical means of its organization.

Characterization of the formation of the specified components was carried out by determining its level (high, medium, low) in accordance with the developed criterion indicators [1].

To diagnose and monitor the competence of students' self-education, a set of methods was used, which included questionnaires, testing, observations, conversations with teachers, studying the products of independent activities, etc. Since the competence of self-education of a future teacher implies the presence of a significant amount of self-educational skills, control papers, specially designed self-educational tasks were used to obtain diagnostic data, which were used to determine the level of development of students' abilities to determine a goal and plan of work, implement an individual self-education program, expert evaluation projects during the final certification, etc.

The data obtained as a result of the approbation of the developed technology testify to significant positive changes in the levels of self-education competence formation of the future teachers of the experimental group according to all criterion indicators (Fig. 6), which gives grounds for a conclusion about the effectiveness of the proposed technology and the feasibility of its introduction into the educational process of pedagogical institutions of higher education.

	п	I	II	III
low	71	50	25	03
medium	28	40	55	67
high	01	09	19	30

Experimental group

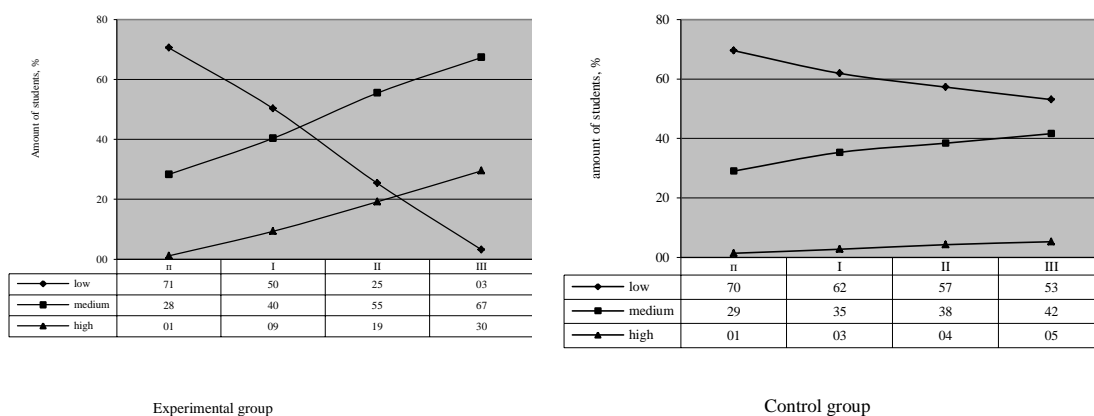|	п	I	II	III
low	70	62	57	53
medium	29	35	38	42
high	01	03	04	05

Control group

Fig. 6. Integrated characteristics of the step-by-step formation of self-education competence of the future teachers in the experimental and control groups.

Marking: п – the starting cut, I – propaedeutic stage,

II – basic stage, III – productive stage.

Conclusion. Therefore, the relevance of the study of the issues regarding the essence of the competence of self-education of the future teacher in the conditions of the information and educational environment and the search for adequate ways of its formation in the educational process has become acute due to the need to overcome the contradictions between the urgent need to implement the concept of lifelong education and the insufficiency of theoretical research devoted to the problems of self-education in conditions of the information society; between the powerful self-educational potential of the modern informational and educational environment in the institutions of higher education and the unsatisfactory degree of its use by students; between the need to pay special attention to the formation of self-education competence among future teachers and the lack of thorough technological developments in this direction.

Thus, the demonstrated relevance of one of the main problems of modern pedagogical education is undeniable. In the modern conditions associated with the spread of the coronavirus pandemic and the existing state of war in Ukraine, the formation of a new generation of teachers capable of lifelong self-education is of particular importance. Based on the definition of the essence of the concept of «self-education of the future teacher», individual stages of self-education the content of the self-education competence of the future teacher in the conditions of an open informational and educational environment and its structural components are presented: motivational-value, organizational, procedural-informational and control-reflective. In our opinion, the development of the information and educational environment is one of the key factors in the formation of the competence of self-education of the future teacher, since its didactic functions are directly correlated with the process of self-education of students. The revealed transformation of the self-education activity of the future teacher in today's conditions led to the search for Internet services, educational platforms to support each of its stages. A well-founded technology for the formation of self-education competence in future teachers in modern conditions in the process of their professional training should be guided by certain principles and implemented

taking into account certain factors and approaches, the observance of which actualizes the achievement of a positive result of its implementation. Experimental verification of the developed technology proved its positive impact on the formation of both individual self-educational skills and the self-educational competence of the future teacher as a whole, which was confirmed by mathematical methods of processing the received data.

We see *the prospects of the research* in the further improvement of educational and methodological support of the developed technology in the direction of its adaptation for students of various specialties, in studying the relationships between self-education of teachers, their personal and professional growth and improving the quality of education and personal development of students.

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ТЕХНОЛОГІЯ ФОРМУВАННЯ ІНФОРМАЦІЙНО-КОМУНІКАТИВНОЇ КУЛЬТУРИ МАЙБУТНІХ ВИХОВАТЕЛІВ ЗАКЛАДІВ ДОШКІЛЬНОЇ ОСВІТИ

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У статті розглядається технологія формування інформаційно-комунікативної культури майбутніх вихователів закладів дошкільної освіти. Розроблено теоретичну модель, виокремлено чотири блоки цієї технології: цільовий, що представлено метою та завданнями; теоретико-методологічний, що містить наукові підходи та принципи функціонування цілісної системи формування інформаційно-комунікативної культури майбутніх вихователів закладів дошкільної освіти; організаційно-змістовий, складниками якого є зміст, форми, методи, засоби, педагогічні умови та етапи дослідження; критеріально-результативний, що має компоненти, критерії, показники, рівні сформованості інформаційно-комунікативної культури майбутніх вихователів та передбачуваний результат – підвищення рівня сформованості інформаційно-комунікативної культури майбутніх вихователів закладів дошкільної освіти. З'ясовано мету педагогічної технології та визначено підходи до формування інформаційно-комунікативної культури майбутніх вихователів закладів дошкільної освіти: системний, компетентнісний, контекстний, діяльнісний, особистісно орієнтований, герменевтичний, культурологічний та інтегрований; описано й проаналізовано принципи системності та послідовності, проблемності, самостійності й активності,