ICT AS A MEANS OF IMPLEMENTING THEMATIC FIN-MODELING IN THE ORGANIZATION OF TRAINING IN INSTITUTIONS OF HIGHER PEDAGOGICAL AND ADULT EDUCATION

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Abstract: Intensive innovative development of ICT actualizes the problem of formation of basic and subject-oriented levels of IC competence in combination with continuous personal and personal-professional self-development of the modern person. In the study, a solution to this problem was reached with respect to future teachers and those already working on the use of ICTs through thematic FIN modeling, which is a combination of formal (F), informal (I), and non-formal (N) education in line with the formulated theme. Models of sequential, parallel and parallel sequential ordering of these types of education have been applied to construct an individual educational trajectory of personal self-development (in relation to future teachers) and personal-professional self-development (in relation to already employed teachers). The implementation of thematic FIN modeling using ICT tools, firstly, facilitated the formation and development of the IC competences of future teachers and those already working during their active involvement in the process of using the information and learning environment to create their own information and educational space of self-development. Secondly, it enabled identifying of examples of variant realization of personal self-development by future teachers and personal-professional self-development of already employed teachers; third, the ordering of information of theoretical and practical direction became possible.

Keywords: FIN-modeling, Formal education, IC-competence, Information education, Information and communication technologies, Non-formal education, Personal self-development of teachers, Personal-professional self-development of teachers.

1 Introduction

Modern society is characterized as an information society and a knowledge society. The achieved level of social development has affected the educational sector, causing its development as a system that encompasses a person from birth to the end of life, and affirming the priority of continuous personal development of the future teacher and the personal and professional development of an already working teacher. In these circumstances, the educational industry is extremely open to the innovation of scientists and practitioners, who are concerned with the use of information and communication technologies (hereinafter – ICT) as an indispensable attribute of the functioning of the information and knowledge society, daily life of modern human, organization of the modern educational process.

ICT is an especially important tool for organizing the educational process, given:

- Taking into account the dynamics and scale of modernization and transformation of social processes and changes in education;
- Attaching particular importance to the desire and ability of the modern man to explore the novelty and complexity of the changing world for a productive and purposeful life-long life;
- Orientation to the constant processing of information resources during the acquisition of pedagogical education in higher education, professional formation during pedagogical activity and professional development in adult education.

Informatization of the educational process and professional activity involves the intensive introduction of ICT. ICT is a set of technologies that provide information capture, processing and exchange (transmission, dissemination, disclosure) [14]. With the help of ICT, one can present any type of information (numbers, texts, sounds, images) in digital format, in a format suitable for storage and processing on a computer, transfer information from computer to computer, provide access to any point which user can reach in the world of information space, etc.

Scientific and educational sources refer to such technologies as information, communication, computer, network, digital and mass media digital technologies. It is noted that information technology is a means of information processing: receiving, converting, transmitting, storing, using, etc. Information technology includes various systems. These are text processing systems, tabular data processing systems, multimedia systems, network planning systems, expert systems, decision support systems and satellite monitoring technologies, geographic information systems, etc.

The use of information technology in professional and educational activities involves working with information that includes the following [6, 7, 12, 13, 15]:

- Analysis of information to establish the degree of its reliability, completeness and objectivity in terms of free and unrestricted access to sources of information, uncontrolled distribution;
- Anticipation of the consequences for the use of information and willingness to take responsibility for it;
- Attitude to information and its search as an opportunity to achieve a certain level of professional and personal development. Communication technologies provide activity in the local computer network and the global Internet.

Computer technology enables the collection, processing, storage and transmission of information by computers. The basis of modern computer technology is three technological advances: 1) the ability to store information on electronic media; 2) development of a means of communication; 3) improving the process of automation of information processing using a computer [1, p. 5]. The basis of computer technology is software and hardware. These are personal computers (workstations) with the necessary set of peripherals that are connected to local and global computer networks with certain software.

The use of computer technology in professional and (or) educational activities increases the level of its effectiveness, as it contributes to the following [1]:

- Simplification and acceleration of the processes of processing, transmission, presentation and storage of information;
- Increasing the amount of useful information with the accumulation of standard solutions and generalization of the experience of scientific developments;
- Ensuring the depth, accuracy and quality of tasks;
- Analysis of a significant number of options for the synthesis of objects and decision-making;
- Reduction of terms of development of work, its complexity and cost, and also improvement of conditions of its performance;
- Reduction of time for processing of results and analysis of certain data.

Network technologies apply to the design, management, operation of network and server infrastructure in various institutions and corporations, as well as the management of operating systems, including servers and services.

2 Materials and Methods

Digital technologies ensure the functioning of digital resources, digital tools and services (Table 1), digital educational resources (digital libraries, digital textbooks, e-learning platforms) [5], as well as the digitalization of the educational audience [4].

Table 1: Data on digital tools: purpose, examples [8]

Digital Tools	
Purpose	Example
Webinars	Zoom, Google Meet, Skype, Cisco Webex Meetings
Messenger communication	Viber, WhatsApp, Telegram, Slack
Management of educational group work	Microsoft Teams, Granatum, TrainingSpace
Conducting surveys	Kahoot!, Socrative, Plickers, Quizizz, Quizalize, Mentimeter
Collaboration, work on documents	Notion, G Suite, Google Docs
Visualization tools	Visme, Easel.ly, Google Charts, Piktochart, Venngage, Canva
Survey tools	Classtime, Mentimeter, Kahoot!, Poll Everywhere, Google Forms, EDpuzzle, ClassMaker
Tools for creating presentations	Prezi, Moovly, Emaze, Beautiful.ai
Tools for creating mental maps	XMind, Mindmeister, Mindjet Coggle, WiseMapping, Mind42, FreeMind, Spider Scribe, Mindomo
Chronology of events	Timeline JS, TimeToast, Histropedia, Sutori
Tag clouds	Tagul, Tagxedo, Wordle i Wordclouds
Virtual digital boards	WikiWall, Tutorsbox, Glogster, Dabbleboard, Twiddla, Scribblar, Padlet, Educreations, Popplet, Realtimeboard (Miro), Twiddla
Webinars	Zoom, Google Meet, Skype, Cisco Webex Meetings

Digital tools and services are used for [8]:

- Organization of webinars (services for video conferencing);
- Communication through messengers (messengers, groups in social networks);
- Management of educational group work (services for the organization of group work, interaction);
- Attracting and conducting surveys (tools for conducting online surveys, tests);
- Organization of joint work with documents (joint documents, presentations and cloud storage). Mass media digital technologies include innovative tools that contain information on software and hardware, as well as devices (servers) and operate on the basis of computer technology.

According to Petryk [20], digital media technologies relate to new developments, namely: mp3 players, Internet tablets, 3D technologies. Media digital technologies facilitate the work with information, as they may contain line-by-line translation, morphological analysis, etc.; provide adjustment of information under educational process or professional activity on the basis of hypertext technologies; promote communication via e-mail, chats, audio or video conferencing, etc.; used as a means of communication in the system "human-artificial intelligence". It is worth emphasizing that UNESCO's media education has been declared one of the priority areas in the pedagogy of the 21st century [2, 3]. The Council of Europe document (2007) [5] states that media education technologies provide an opportunity to understand how mass communication is used in societies, to master the ability to use media and communication with other people, in particular with the following aims:

- Analyze, critically comprehend and create media texts;
- Identify the sources of media texts, their political, social, commercial and/or cultural interests, their context;
- Interpret media texts and values disseminated by the media;
- Select appropriate media to create and distribute own media texts and find an audience interested in them.

According to the ACTIONS model (Tony Bates), the effectiveness and quality of the use of digital media technologies in the educational process and professional activities is determined by the following indicators: accessibility (A), cost structure (C), teaching and learning (T), interaction (I – interactivity), organizational impact (O), novelty (N) and speed (S). In our opinion, the technologies discussed above can be arranged as follows: ICT includes information and communication technologies. Instead, computer, network, digital and mass media digital technologies are technologies that provide expansion of technological characteristics of information, communication and information-communication technologies in case of their use, or are used for a specific purpose as self-sufficient means (Figure 1).
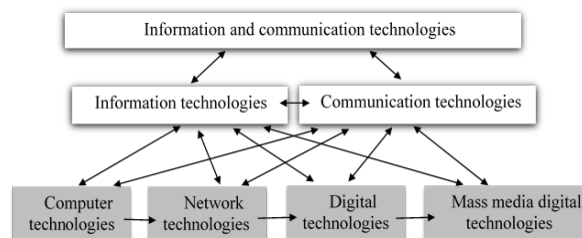

Figure 1 – An essence of information and communication technologies

In the context of the need to master ICT, O. Stolbnikova's [23] reasoning is significant: the more educated a person is in the information society, the more fully, and purposefully he provides himself with information, the more adequately he will form the image of the real world, the world around us. This will allow a person to fully reveal own material and spiritual potential, which, in turn, will provide the most favorable way to realize the unique natural endowments.

Research activities were implemented using the following methods: theoretical (analysis, comparison, generalization); empirical (interviews, surveys, questionnaires of future teachers and those already working to establish the effectiveness of using ICT in the implementation of FIN modeling, i.e., thematic combination of formal, informal and non-formal education); statistical (processing and comparison of the results of quantitative and qualitative analysis of the data obtained).

3 Results

3.1 Model of Formation of Basic and Subject-Oriented Levels of ICT Competence of Future Teacher and the One Already Working

The era of high technology is characterized by extremely active processes of aging and updating knowledge. The course of these processes leads to the awareness of every member of the modern society of the need for continuing education throughout life as a whole professional activity in particular. At the same time, models, forms, and technologies of organization of educational process in institutions of both higher education and postgraduate are of particular importance [19].

The modern pedagogical process should be aimed at establishing productive interaction between the teachers and learners, ensuring the adaptation of the latter to the current conditions of the organization of the educational process using ICT through self-realization and opening of their creative potential [18]. This, in turn, requires, on the one hand, the creation, operation, and continuous development of the higher education and postgraduate information and learning space, and on the other, draws the attention of future teachers and those already working to the constant development of their intelligence, creative potential, and also the formation and development of professional competences, including information and communication competences (IC competences).

Under the IC competency of a future teacher and already employed, we understand [11] his/her willingness to solve professional-pedagogical problems with the involvement of ICT. The readiness components determine the internal motives for using ICT to organize the educational process and self-

development, and the ability to implement the knowledge, skills, and competencies indicated based on this.

The process of forming the ICT competence of a future teacher and an already working teacher takes place at two levels [10]:

1) Basic – the level of formation of basic IC competence, which provides the knowledge, skills, experience necessary for the future teacher and the one already working to solve educational and professional tasks, means of general-purpose ICT;

2) Subject-oriented – this is the level of formation of subject-oriented IR competence, which is manifested in the development of specialized technologies and resources, developed under the requirements of the content of the subject and their implementation in educational and professional activities (Figure 2).
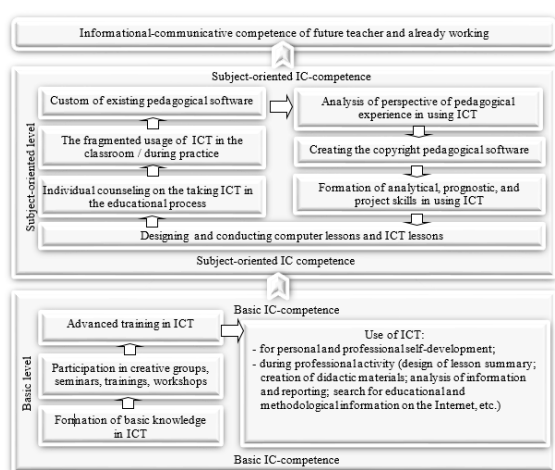

Figure 2 – Model of formation of basic and subject-oriented levels of ICT competence of future teacher and the one already working

The effective realization of the model of formation of basic and subject-oriented levels of ICT competence of the future teacher and already employed one is ensured, first, by their understanding of personal needs, requests, interests; second, the realization of the ability to relate them to the vital, productive and public interests and demands of society; third, the ability to act independently and interact with other members of the teaching staff or (and) teaching community to achieve a professionally meaningful goal and to address practical problems that arise in the course of professional activity.

During the formation and development of the IC competence of future teachers and already employed, it is necessary to create conditions for continuity of this process. Most effectively, this can be implemented with the help of information and educational environment as an artificially constructed system, the structure, and components of which create the necessary conditions to achieve the goal of the educational process, formed by the current level of development of pedagogical science and technical support capabilities. The information-learning environment, with the active use of future teachers and already employed, becomes an information-educational space, the means of which influence the personal and personal-professional development, the component of which is represented by IC competence.

3.2 Methodical Aspects of Formation and Development of IR-Competence Future Teachers and Already Working Ones Using Tools of Information-Educational Environment for the Creation of Own Information-Educational Space

The methodological aspects of the formation and development of ICT competence of future teachers and already employed includes four components:

- Technological – it aims at the practical improvement of the user's skills; building a willingness to use ICT in professional and personal development;
- Programmatic and methodological – skills development: to use ICT and modern technical means of training to achieve the stated purpose; to organize the Internet resources according to their own educational needs and professional situations; to be constantly acquainted with innovative software of teaching of subjects; to use ICT and modern learning tools in professional activity;
- Informative – improvement of the IC-competence of future teachers and already employed, in particular understanding of the essence of information processing, presented in various sources, use of automated systems of search and processing of information, interpretation of information, conversion of visual information into a verbal sign system, modeling of the process of studying different information. effects and phenomena, analysis of information models, etc.;
- Presentation – active participation in various professional competitions, scientific meetings on the implementation of ICT; organizing seminars to promote the experience of integrating ICT into the educational process; participation in cross-curricular ICT projects, and more.

Future teachers and already working people have a strong focus on self-education, which is driven by personal choices and decisions. Self-education activities, first of all, are caused by the awareness of the importance of new information for personal and personal-professional development. External motives play only a minor role in this process or are not taken into account at all.

In the case of future teachers and already working teaching staff using tools of information and learning environment for creating their own information and educational space, it is necessary to adhere to the five component structure and to take into account the cyclical nature of the process (Figure 3).
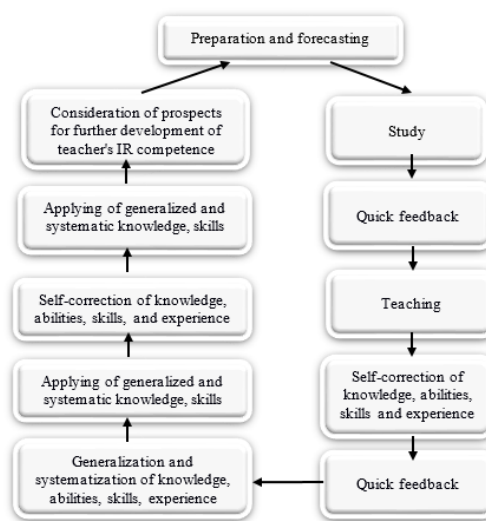

Figure 3 – Structure of the educational process in terms future teachers and those already working use tools of information and educational environment to create their own information and educational space

The first component is preparation and forecasting. It is realized by the formation of the purpose of training, involves the diagnosis of existing knowledge, skills on the topic, the creation of own plan of educational activities and preparation for self-realization during training. The second component is training. It provides active participation in modules of training and achievement of self-formulated goal. The third component is online feedback. It includes selection of the optimum form of participation in training of a special course, during a meeting of a creative group, distance course training, etc. The fourth component is the self-correction of knowledge, skills, and

experience. The self-education activities of future teachers and those already working imply the use of ICT tools in the educational process. The fifth component includes generalization and systematization of knowledge, skills, and experience. It implies participation in various professional events.

The process of training of future teachers and already employed is confirmed at the stages of "Training", which provides for the corresponding certificate, which, in turn, captures the positive dynamics in personal and professional development and influences the motives, giving rise to the desire to proceed with continuous self-education activities in the field of ICT. Also, for the effective formation and development of IR-competence in future teachers and those already working, active and effective use of information and communication technologies in the educational process, the development and implementation of a professional standard of teacher in the education system of Ukraine is of importance.

3.3 The Essence of FIN-Modeling as a Process of Thematic Combination of Legislatively-Regulated Types of Education

According to Article 8 "Types of Education", the Law of Ukraine "On Education" (2017) [16], formal, non-formal, and informal education have become normatively legal. Formal education is seen as a legislatively normalized translational model of social experience, the submodels of which are implemented at different levels of education. Formal education is enabled by formal training, which is a process of providing learners with a social experience that is structured and harmonized with relevant state standards and curricula, through direct and indirect engagement with learners, and is completed in the education with the results of training to achieve the appropriate level of education and the qualification recognized by the state, determined by the standards of education.

Non-formal education is an education that is additional, alternative and/or complementary to formal education. Its acquisition is provided by non-formal learning. This type of learning is a process of giving learners an individually significant part of the social experience. As a rule, non-formal education is acquired through educational programs and does not involve the awarding of state-recognized educational qualifications by educational levels, but can be completed by the award of professional and/or partial educational qualifications. Informal education is regarded as self-education. Accordingly, informal learning aims at acquiring certain knowledge and skills in a self-educational activity, organized on own initiative, and envisages self-organized acquisition of certain competencies by a person, in particular, during daily activities related to professional, public, or other community.

Upgrading courses are conducted to enhance/acquire competencies within the professional activity or area of expertise [16]. Non-formal education in postgraduate teacher education can be carried out in two directions: the first direction implies increasing the level of readiness of teachers to fulfill their professional tasks and responsibilities; the second direction is the acquisition of the ability to perform additional tasks and responsibilities by teachers, in acquiring new knowledge and skills within their professional activity or field of expertise.

According to the first-line teacher training, non-formal education is built based on the curriculum of advanced training, is implemented in accordance with a certain number of classroom and non-classroom hours, contains philosophical, methodological, psychological, and didactic components that reflect the current state of the art development of science in general and education in particular. According to Article 60 "Postgraduate education, professional development and training of pedagogical and scientific-pedagogical workers" of the Law of Ukraine "On Higher Education" [17] the results of professional development and training are taken into account during 1) conducting certification of pedagogical workers; 2) election to a position by competition or the conclusion of an employment contract with scientific and pedagogical staff.

The second component directly serves to provide teachers with the ability to perform additional tasks and responsibilities, the emergence of which is caused, on the one hand, by constant social development and, on the other, by teaching students in new conditions of social development. This is realized in the process of acquiring new knowledge and skills within a professional activity or field of knowledge.

Informal education (self-education) of future teachers and those already employed is a self-organized process of knowledge acquisition, as well as acquisition of skills or a process of competence formation as a certain combination of knowledge, skills, ways of thinking, views, values, other personal qualities that have acquired personal values as they affect the successful pursuit of professional and/or further training activities.

The essence of FIN-modeling [21; 22] is to carry out a process of thematic combination of legislatively-regulated types of education, i.e., formal (F), informal (I) and non-formal (N) education in order to enable future teachers or those already working study to more thoroughly on a certain topic.

3.4 Examples of Using ICT as a Means of Implementing Thematic FIN Modeling

According to the results of the study, acquaintance of future teachers and those already working with students is most appropriate to carry out during the study of the topic "Own personal and personal-professional development". This topic is elaborated using the materials of the site "Potential of Scientific Research" – "Potential OSR" [24] in the following sequence:

1. Completing the questionnaire to establish an understanding of the concepts of "personality", "pedagogical skill", "pedagogical professionalism" and "personal and professional development" (Figure 4).

Figure 4 – Screenshot of the "Potential OSR" [24] website with a survey of future teachers and those already employed

2. Filling in the columns of Table 2 according to the results of the questionnaire. Respondents put the + mark on those types of education that have been identified by their source (s) of obtaining information on the concepts of "personality", "pedagogical skill", "pedagogical professionalism", and "personal and professional development" before questioning.

3. Analysis of table's data, identification of sources of information on the above concepts after the questioning, determination of the content orientation of further self-educational activities (Table 2).

Table 2: Analysis of types of education as sources of obtaining information about the concepts of "personality", "pedagogical skill", "pedagogical professionalism", "personal and professional development"

Definitions	Types of education as a source of information about the concept		
	Formal	Informal	Non-formal
Personality			
Pedagogical skills			
Pedagogical professionalism			
Personal-professional development			

In discussing the data in Table 2, it was found that the essence of the concept of "personality" was partially revealed in the process of obtaining a formal education at the master's level. In non-formal education, the issue of professionalism was considered in the context of the correspondence between teacher's professional training and quality provision of educational services in modern conditions of pedagogical activity.

In order to direct self-educational activities, prospective teachers and already-educated students were given access to the Potential OSR materials (https://sites.google.com/view/project-science-education), which contained relevant material for self-study, that is, for the implementation of informal education, the results of which formed the basis for conducting classes in formal education (for future teachers) and non-formal (for teachers who are already working) (Figure 5).
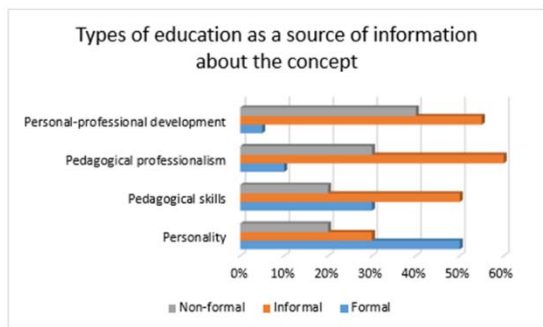

Figure 5 – Screenshot of the page "Potential OSR" [24] with the dominance of information education as a tool for self-educational activities of future teachers and those already employed

The implementation of prior information education facilitated the conscious operation of scientific data during practical classes, the manifestation of cognitive independence and activity during interaction with others in a pair (group). As a result of previous content-oriented self-educational activities, both future teachers and already working teachers have been able to accomplish a number of tasks, including the following:

1. Finding the basics phrases for interpretation the concept of "personality" (Figure 6).
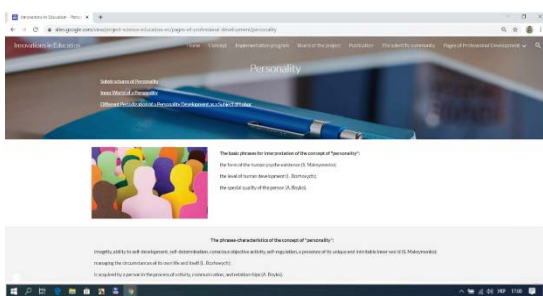

Figure 6 – Finding the basics phrases for interpretation the concept of "personality" [24].

2. Identification of the factors that have a decisive influence on the development of the individual, formulating a conclusion about the decisive influence of both social and natural factors, while the external, through the internal, is processed, mastered and used in practice. Therefore, the individual is the subject of knowledge and the active transformation of the world.

3. Differentiation of the concepts of "holistic personality" and "mature personality" based on the conscious use of scientific works of S. Maksimenko. Future teachers and already working teachers have noted that a holistic personality arises not from an external, but internal expediency, by transforming a cultivated culture into a living, individual creative activity. The holistic personality is the subject of own life, which includes the entirety of the content of the individual life in a real cultural and historical context. Instead, a mature personality is functionally autonomous, with conscious motivated behavior, has broad "Self" boundaries, a healthy sense of reality, and a need for self-improvement.

4. Explanation of the structure of personality based on the scientific achievements of psychologists, in particular S. Maksimenko and K. Platonov, about the content that future teachers and already working teachers learned in information education (Figure 7).
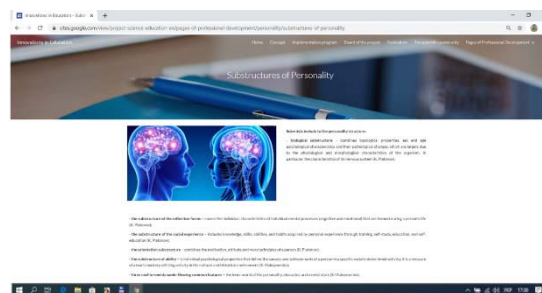

Figure 7 – Screenshot of the site "Potential OSR" [24] with the structure of the information block "Personality" – "Substructures of Personality"

Since information for information education contained data about the inner world of personality, character and mental states, future teachers and already working teachers were offered tasks that envisaged the following: 1) isolation of the characteristics of the inner world of human, in particular, controllability not only of himself, i.e., the inner world, his dynamics - self-control, but also human as a universal system, a component of which is the inner world; 2) formulating the conclusion that a personality acts as a subject of the inner world, and through it implements one or another behavior; 3) disclosure of the dual nature of the inner world of human based on comparing the content of the statements of psychologists (Figure 8).
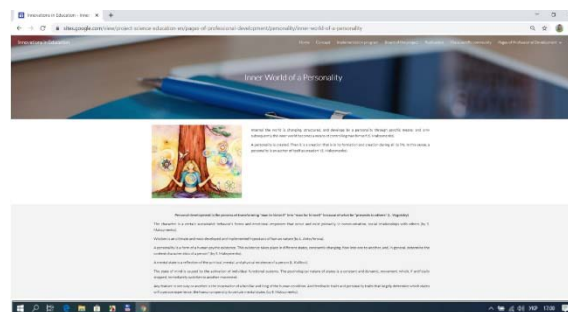

Figure 8 – Screenshot of the site "Potential OSR" [24] with the structure of the information block "Personality" – "Inner World of a Personality"

5. Consideration of personality development as a complex process in which levels of development are constantly changing. Higher levels emerge in the earlier stages of development and features of previous age stages are revealed in subsequent stages. Hence the analysis of personality development at the level of development of cognitive mental processes, emotions, feelings, needs, interests, ideals, beliefs, consciousness, self-consciousness, abilities, temperament, character, skills, and habits in complex interaction.

Also, informal education envisaged the formation of future teachers and already existing teachers of the idea of 1) the profession as a "sphere of manifestation of personality" (according to Klimov), because "a person finds in the profession something that corresponds to the meaning of hus/her soul and the image of thoughts"; 2) different periods of personality development as a subject of labor (according to Klimov, Sigaeva, and Savosh) (Figure 9).
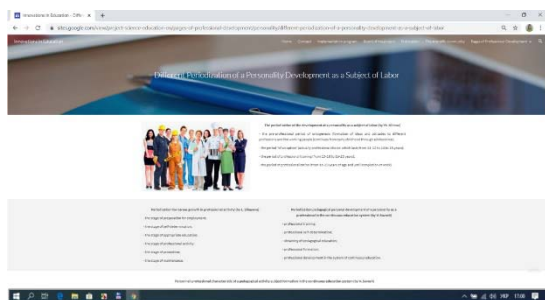
Figure 9 – Screenshot of the page "Potential OSR" [24] with the structure of the information block "Personality" – "Different Periodization of a Personality Development as a Subject of Labor"

6. Distinguishing concepts of "pedagogical skill", "pedagogical professionalism" based on a comparison of scientific views on the disclosure of their essence.

7. Comparison of the concepts of "pedagogical competence of the teacher", "pedagogical culture of the teacher", "personal and professional development of the teacher" served to isolate several elements important for teachers to understand their essence of phrases, such as dynamic combination (indicates a constant formality, continuous development in informal and non-formal education); socio-professional quality (implies acquaintance with the relevant part of the human culture, in which the spiritual values of education are embodied to determine the way of expressing one's self in pedagogical activity); the process of continuous improvement of personal and professional qualities (involves the process of realization of personal and professional development in formal, informal, and non-formal education, which acquires coherence through preliminary modeling of the process).

8. Distinguishing of personally meaningful professional qualities based on working out the views of scientists on the nature and classification of professional qualities. It implies drawing attention to the following qualities: professional (necessary for pedagogical activity); operating (necessary for the realization of professional motives and serving the comprehension (improvement) of qualification categories, obtaining pedagogical titles (Figure 10).

Figure 10 – Screenshot of the site "Potential OSR" [24] with the information block "Pedagogical Professionalism"

9. Comparison of the purpose and process of certification. Justification of attribution of attestation to external motives, and certification to internal ones. Formulation of a conclusion on the impact of certification on the quality of teaching activities.

Further actions were aimed at modeling of personal development in future teachers and working teachers, as well as professional development based on predicting the directions of education, self-education, utilizing formal, informal, and non-formal education. Modeling was preceded by familiarization with variants of educational models of formal, informal, and non-formal education in the process of thematic FIN-modeling), in particular, educational models of sequential, sequential-parallel, and parallel organization of these types of education (Figure 11).
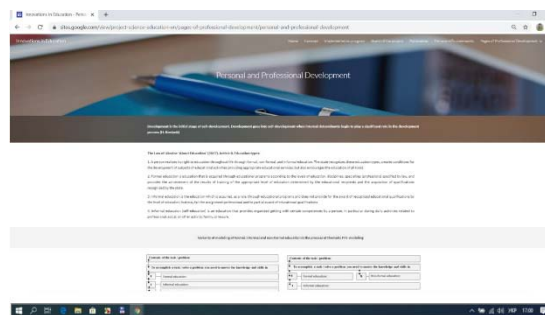

Figure 11 – Screenshot of the site "Potential OSR" [24] of the models of sequential ordering of formal, informal, and non-formal education in the process of thematic FIN- modeling

The work of future teachers and those already working thematic FIN-modeling worked for their personal and professional development, as it aimed at knowing themselves as individuals, mastering professional knowledge and skills.

4 Discussion

4.1 Suggestions on Implementation of Thematic FIN Modeling by Means of ICT

The Law of Ukraine "On Education" refers to the individual educational trajectory as a personal way of realizing the personal potential of an education seeker, which is formed taking into account his/her abilities, interests, needs, motivation, opportunities and experience, based on the choice of the type finder, education, the subjects of educational activity and the educational programs offered by them, educational disciplines and the level of their complexity, methods and means of training. Legislative normalization of the essence of the individual educational trajectory requires the acquirers of education to achieve formation of various skills, including the ability to choose the types, forms, and pace of education. As skills are formed on the basis of exercises, the process of implementation of thematic FIN modeling by means of ICT acquires great importance. Future teachers and practitioners are learning to combine formal, non-formal, and informal education through thematic FIN modeling through ICT.

According to the formulated theme, they learn to apply models of consistent, parallel, parallel-sequential ordering of formal, informal, and non-formal education. In this way, future teachers build an individual educational trajectory of personal self-development, and already working teaching staff - an individual educational trajectory of personal and professional self-development.

5 Conclusion

Introducing future teachers and those already working on the process of implementing thematic FIN modeling by ICTs should become an integral part of the educational process organized in higher education and postgraduate education.

A number of factors that influence the organization of the educational process are including the following:

- Motivational factor – to familiarize future teachers and those already working with the process of implementing thematic FIN modeling with ICT tools on the basis of a topic defined by them as requiring thorough consideration in view of its relevance;
- Knowledge factor – the formation and development of the IR-competence of future teachers and already employed ones should be ensured by their active involvement in the process of using the information-learning environment to create their own information-educational space of self-development;
- Procedural factor – ICT tools should serve the understanding of the processes of personal and personal

and professional self-development by future teachers and already working ones entities, to identify the variant implementation of these processes by other educators and acquirers of education, to organize provision of theoretical and practical information;

▪ Reflective factor – the analysis of the educational process should be directed to the awareness of future teachers and already working ones in thematic FIN-modeling by means of ICT as a continuous process as it serves the course of life-long learning process and professional development in the system of continuous education in particular.

Literature:

1. Arefiev, V.N. (2001). *Computer technologies in science and education: methodical instructions to practical occupations.* Ulyanovsk, Ul-GTU.

2. Boone, E., Jones, J., & Safrit, R. (2002). *Developing Programs in Adult Education: A Conceptual Programming Model.* Waveland Press.

3. Chasko, T. (2018). Emerging pedagogies for effective adult learning: From andragogy to heutagogy. *Archives of Medicine and Health Sciences*, 6(2), 278-283.

4. Chongsok, A. (2020). Unequal loneliness in the digital classroom: two effects of school computer loneliness and sustainable education lessons in the e-learning era. *Sustainable development*, 12(19), 7889. DOI: https://doi.org/10.3390/su1 2197889.

5. Council of Europe Recommendations on Media Education Policy (2007). *Les recommandations du Conseil de l'Europe en matière de politiques éducatives relatives aux médias.* Available at: http://www.mediagram.ru/netcat_files/106/104/h_edbe6103 64875340b61ba6868fedf9ba.

6. Dintoe, S. (2018). Information and communication technology use in higher education: Perspectives from faculty. *International Journal of Education and Development using Information and Communication Technology (IJEDICT),* 14(2), 121-166.

7. European Commission. (2020). *Improving Policy and Provision for Adult Learning in Europe.* Improving Policy and Provision for Adult Learning in Europe.

8. Grynevych, L., Ilyich, L., Morse, N., Proshkin, V., Shemelynets, I., Linyov, K., Riy, G. (2020). *Information materials.* Kyiv: Borys Grinchenko Kyiv University, 76 47.

9. Homavazir, M.F. & Gopal, R.A. (2018). Study on the digitalization of higher education and its impact on student learning and assessment in commercial, management, and research colleges in Mumbai. *AADYA-Journal of Management and Technology (JMT)*, 8(1), 93-100.

10. Holodyuk, L.S. (2009). Teacher training for the use of information and communication technologies in the educational process in the system of postgraduate pedagogical education: substantive-procedural aspect. *Informatics and Information Technologies in Educational Institutions*, 6, 82–86.

11. Holodyuk, L.S. (2011). Designing information and communication support for the lesson. *Computer at school and family*, 4, 18–20.

12. Kambouri, M., Mellar, H., & Logan, K. (2006). *Adult learners and ICT: An intervention study in the UK.* Lecture Notes in Computer Science, 4227, 213-226.

13. Karunaratne, T., Peiris, C., & Hansson, H. (2018). Implementing small scale ICT projects in developing countries – how challenging is it? *International Journal of Education and Development Using Information and Communication Technology (IJEDICT)*, 14(1), 118-140.

14. Methodical materials on informatics. (2021). *Information and communication technologies.* Available at: https: //www.ua5.org/svit/281-nformacjjn-jj-komunkacjjn-tekhnolo g.html.

15. Muianga, X. (2019). *The role of ICT in the shift towards student-centered learning in higher education.* Stockholm University, DSV Report Series No. 19-006.

16. On education. (2017). *Law of Ukraine from 05.09.2017 № 2145-VIII*. Information of the Verkhovna Rada of Ukraine, № 38-39.

17. On Higher Education. (2014). *Law of Ukraine of 01.07.2014 No. 1556-VII*. Information of the Verkhovna Rada of Ukraine, № 37-38.

18. On the National Strategy for the Development of Education in Ukraine for the Period until 2021. (2013). *Decree of the President of Ukraine of 25.06.2013 No. 344/2013*. Government courier, № 117.

19. On the Professional Development of Employees. (2012). *Law of Ukraine of January 12*, *No. 4312-17*. Available at: http://zakon2.rada.gov.ua/laws/show/4312-17.

20. Petryk, L.V. (2017). *Media literacy as a skill of the XXI century.* Collection of scientific works "Pedagogical education: theory and practice. Psychology. Pedagogy. Kyiv: Borys Grinchenko Kyiv University, 27, 100–103.

21. Savosh, V.A. (2020). *Professional development of physics teachers in the system of continuous education: theory and practice.* Monograph. Lutsk.

22. Savosh, V.A. (2017). *The dyadic basis of consideration of the phenomenon "system of continuous education".* Lutsk.

23. Stolbnikova, E.A. (2006). *Development of critical thinking of students of a pedagogical university in the process of media education (based on advertising material).* Taganrog, Kuchma Publishing House,

24. The site "Potential OSR". (2018). *Innovations in the world.* Available at: https://sites.google.com/view/project-science-edu cation.

25. UNESCO Youth Media Education Survey. (2001). *Where Are We Going and How Can We Get There?* Available at: http://www.mediagram.ru/netcat_files/106/104/h_46bbc3c92e11 d55f55f90fff201c6596.

Primary Paper Section: A

Secondary Paper Section: AM