USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN FOREIGN AND UKRAINIAN PRACTICES IN CONTINUING PEDAGOGICAL EDUCATION OF THE DIGITAL ERA

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Abstract: The digital age is presented in the context of significant civilizational and educational changes. The changes that have taken place in the understanding of the essence of man and in the definition of actions that affect the process of his existence are considered. Moreover, changes are related to the following: 1) education as a specially organized purposeful socialization and acculturation of man; 2) pedagogical activity and revealing a new approach to understanding the essence of the process of cognition, as well as determining the direction of the motives of pedagogical creativity; 3) pedagogical interaction as a two-way process; 4) global destabilization of the socio-economic reality caused by the COVID-19 pandemic; 5) globalization as a consequence of the information society development. Continuing pedagogical education in the digital age is characterized as lifelong learning and the process of prolonged assimilation of sociocultural experience, professional knowledge and skills. This process includes preparatory (vocational), basic (vocational), postgraduate (vocational) stages. The research is focused on the last two stages. Foreign and Ukrainian practices organized in higher pedagogical education institutions and in postgraduate pedagogical education institutions are described as responsive to the development and modernization of information and communication infrastructure, information and communication technologies, means of dissemination of information products and information flows. Various aspects of the use of information and communication technologies in the modern educational process aimed at the formation of information and communication competence of future teachers, and various foreign and domestic practices of teacher training to expand their skills are considered.

Keywords: Advanced training, Continuous pedagogical education, Digital era, Information and communication competencies, Information and communication technologies, Institutions of higher pedagogical education, Institutions of postgraduate pedagogical education.

1 Introduction

The digital age is characterized by essential civilizational and educational changes. Based on the generalization of scientific papers, we can distinguish the following groups of changes:

1. Changes in the understanding of the essence of human and in the definition of actions that affect the process of his existence. We are talking about:

- A change in the view of man, which is manifested in the transition from understanding man as a biosocial being to understanding him as a 'noosphere', 'cosmoplanetary', divine being [27];
- Change in the model of human existence is recorded as a transition from the model of adaptive actions to the model of non-adaptive actions. In turn, this transition led to the replacement of the actions of regulation of the external environment by actions of self-regulation, self-actualization, self-realization, self-reflection, self-development, self-improvement, self-belief [9].

2. Changes related to pedagogical activities and revealing a new approach to understanding the essence of the process of cognition and determining the direction of the motives of pedagogical creativity. It relates to the following aspects:

- A change in the paradigm of cognition, which consists in the transition from focusing on external sociopedagogical reality in the planetary model of education to focus on the depths of their own self-identifying through reflection, critical thinking, self-awareness in trans- and interdisciplinary model of education [11];
- Change in the motives of pedagogical creativity, which is manifested in the replacement of the current pragmatic attitude of pedagogical activity as a means of ensuring life for a potential spiritual attitude of its implementation as the meaning of life, directed to eternity [27].

3. Changes related to education as a specially organized purposeful socialization and acculturation of man. These processes ensure: succession of generations; preservation of cultural norms with a focus on the future state of culture; creating conditions for the full realization of the inner potential of each person and becoming a member of society. These changes apply to [2]:

- The purpose of education – changes are manifested in the transition from knowledge-centered purpose of education to humanistic-human-centered;
- The mission of education – changes are to replace the process of preparation for life by the process of creating (providing) conditions for the formation of personality, which is in the process of self-improvement and forms the social conditions of human lives;
- Motives of the educational process – changes are recorded as a transition from learning, motivated by external circumstances, to self-learning, which is realized through the internal motivation of participants in the educational process;
- Learning process – changes consist in the transition from the reproductive "school of memory" (knowledge focused on the past) to the creative and productive "school of thinking" (knowledge focused on the future);
- The duration of the educational process – changes are manifested in the transition from a discrete educational route, education "for life", to continuous – in other words, continuing education and lifelong creativity.

4. Changes related to pedagogical interaction as a two-way process in which the exchange of actions, operations, verbal and nonverbal signals between participants, and the exchange of attitudes, emotional states, values, all that affects the inner world of man take place. This group of changes includes [12]:

- Change of the paradigm of pedagogical influence – there is a transition from the formative paradigm of pedagogical influence to the developmental one;
- Change of the subject of influence is manifested in the transition from the perception of the learner, the object of pedagogical influence to the perception of his subject, which transforms external influence and self-influence;
- Change of interaction of participants of educational process is fixed as transition from subject-object interaction as the mechanism of knowledge transfer to subject-subject as the mechanism of joint mastering of knowledge (by means of creativity).

5. Changes related to the global destabilization of the socio-economic reality caused by the COVID-19 pandemic [17]:

- Change in worldview   the correct attitude for the perception of changes that occur;
- Change of attitude   the transition from destructive (anxiety) states (fear, unmotivated aggression, distrust, apathy, depression) to conscious stabilization (harmonization) of the psychological state.

6. Changes related to globalization as a consequence of the development of the information society, which is based on systems of creation, dissemination, storage, processing of information and knowledge. In the context of globalization, the following changes are taking place [21]:

- Change in the exchange of information and knowledge the transition to the coordination of actions of much greater complexity than the interaction between individual actors or groups of people;
- Change of information needs, information resources, information structure the transition to learning, which contributes to the active overcoming of communication barriers and obstacles of technical, linguistic, psychophysiological, symbolic, semantic, situational, social, etc. nature that arise in the global informatization of society in the digital age.

Research problem and focus. Analysis of the learning process in institutions of higher pedagogical education and institutions of postgraduate pedagogical education with an emphasis on foreign and domestic practices of information and communication technologies, formulation of generalized data and conclusions that have theoretical and practical significance for continuing pedagogical education in the digital age.

2 Materials and Methods

In the digital age, continuing pedagogical education is characterized as lifelong learning, the process of prolonged human assimilation of sociocultural experience, professional knowledge and skills.

1. Continuing pedagogical education includes three stages [10; 20]:

- Preparatory or vocational guidance a characteristic professional self-determination, choice of profession and decision-making based on anticipation of own life prospects, forecasting own professional development in accordance with the motives and needs experienced;
- Basic or professional-formative includes the formation of professional competencies in the institution of higher pedagogical education;
- Postgraduate or professional-accompanying it is aimed at the development of professional competencies in institutions of postgraduate pedagogical education.

The learning process at the professional-formative and professional-accompanying stages of continuing pedagogical education, which is organized in the digital age, is determined by other processes, namely:

- Rapid growth of modern knowledge;
- Rapid development of various technological processes;
- Rapid half-life of previously acquired professional competencies;
- Accelerated development of self-awareness and reflection of an adult as a result of global and local crisis phenomena, which destroy the usual role attitudes and create awareness of the need for rapid and effective response to the challenges of the digital age.

In the conditions of dynamic changes of digital age, the progressive a process of "formation – development" of professional competences of the future teacher and already working one is caused by intensive development and modernization of information and communication infrastructure, information and communication technologies, means of distribution of information products and information flows.

3 Results and Discussion

The use of information and communication technologies in foreign and domestic training practices for future teachers is implemented using various modern tools. These are presentations (Google Presentations, Prezi, Libre Office Impress, Power Point and others), video programs (Canva, Powtoon, Pixton, etc.), augmented reality (My Cardiac Coach, Star Walk 2, Google Translate, Wikitude), simulations (Go- Lab), online boards (Padlet; WikiWall, etc.), smart cards (MindMeister, MindMup, Mindomo, Coggle, Draw.io, bubbl.us), infographics

(easel.ly, Visual.ly, etc.), tools to create online tests (LearningApps, Kahoot, Quizlet, etc.), final assessment using Q-codes (Plickers).

Virtual and augmented reality technologies are intensively used in foreign and domestic training practices for future teachers. These are practical classes in classrooms equipped with virtual reality technologies; virtual field research for observation and study of organisms in the natural habitat; virtual studies of the human body; various virtual trips, virtual participation in historical events; virtual observation of physical phenomena; virtual research, etc. [26, 29, 30].

Examples of the use of information and communication technologies in the educational practice of higher education institutions are computer simulators, in particular:

1. Computer rhetorical simulator [1] for practicing oratory skills, including mastering the properties of voice, diction, facial expressions, gestures. The use of a computer rhetoric simulator is complemented by the use of a video camera, video clips of feature films with a high level of oratory of actors, video clips of speeches, exemplary speeches of teachers, information sites on public speaking, fragments of video tutorials, etc.

2. Computer simulator program for the formation of students' civic skills [28]. This simulator consists of an interactive scheme that includes theoretical information; a set of tasks aimed at developing skills, online services for creating interactive exercises and test tasks. In foreign and domestic practices of training future teachers, two types of virtual tours have become widespread [18]:

1. Multimedia virtual tours, which are implemented on the basis of a selection of information review materials, represented by images (photographs, videos), supplemented by animation, sounds and hyperlinks. Multimedia virtual tours are developed using PowerPoint and Windows Movie Maker.

2. Virtual tours based on 3D technology provide a photorealistic demonstration of three-dimensional space and give the image a visual volume.

Both foreign and domestic practices of future teachers training are characterized by the acquisition of mathematical knowledge using information and communication technologies. These are various educational multimedia resources, including reference books of formulas (Mathcad, Mathematica, Maple, HohliBuilder, Creative) [19].

The practice of training future teachers of literary education provided for the creation of the following [14]: book trailers and comics based on works of art; QR-quests based on the texts of works by modern writers; multimedia presentations on Google Drive; mental maps (Mindmeister resource) based on prose plots; literary web encyclopedia; video presentations about writers and their work (resources such as PoowToon, Prezi); visualized plan of works with the help of infographics; intellectual game tasks (LearningApps resource), etc.

The practice of training future foreign language teachers is accompanied by the use of materials that are posted on specially created websites. An example is the website "Do with us, do as we do, do better than us!" (https://bit.ly/38wXtFz) [15]. The website operates in the digital center mode and provides future primary school teachers with wide access to theoretical and practical content of media applications. The resources of the media center include theoretical content (fact-file about media, algorithm for selection and evaluation of media for foreign language lessons, media didactic support for mastering foreign languages in primary school, resources for professional growth of teachers, plans for future scientific-methodical circle "Media teacher"), video channel and blog in the form of guidelines for the use of media in foreign language lessons, training materials, workshops, etc.

Moreover, both foreign and domestic development practices of teachers of professional skills are characterized by the following processes:

- Further development of information and communication competence;

- Advanced training on the basis of various institutions (Table 1) [17, 27, 29];
- Introduction of various ways of organizing teacher training to develop the ability to use information and communication competencies in professional activities.

Table 1: Variability of institutions for professional development of European teachers

Advanced training institutions	Austria	Bulgaria	The United Kingdom	The Netherlands	Greece	Spain	Germany	Poland	Romania	Slovakia	Hungary	Finland	Czech Republic	Denmark	Italy	Norway
Centers for advanced training																
Institutions of higher education																
Teachers' Association																
Schools																
Adult education institutions																

Thus, in France, the school administration submits applications to institutions responsible for professional development, for the participation of teachers in various refresher courses [7, 25]. Centers for pedagogical documentation have been established to acquaint French teachers with advanced teaching methods and information and communication technologies. These are institutions with information, technological, and methodological resources that respond quickly to changes in society and the pedagogical sphere. The main tasks of such Centers are as follows: providing teachers with information and technological resources; dissemination of effective pedagogical technologies; publishing activity.

Teachers in Germany improve their professional competence on the basis of self-education and refresher courses [16]. To achieve this, a database of courses that are offered for advanced training in various specialties has been created in the Internet. Further, training is carried out in two main areas: improving the quality of lessons and strengthening the skills of school principals.

The administration of the German school together with the teacher, determine the topic and direction of advanced training. The district administration selects the best teachers who can conduct educational activities on the stated topic. Moderators conduct educational activities that have a practical focus and meet the requirements of the digital age. Moderators are selected annually based on the results of the competition. All moderators who have passed the competitive meeting meet twice a year. Together they develop new topics, test them, organize a thematic event, if necessary, make adjustments to its content and the process, then offer a developed and tested topic to improve the skills of teachers. In the headquarters of the moderators-organizers, according to the requests for each teacher, a program of one or two events is formed. During these school-based events, the use of information and communication technologies by moderators and the development of information and communication competence of teachers within the stated topic is a mandatory attribute.

The system of postgraduate education in England [30] has more than 100 courses, after which a certificate of postgraduate education is issued and the status of Qualified Teacher Status (QTS) is awarded. These courses include the teaching of so-called "integrated courses" to study the teaching of diverse subjects with information and communication technologies. Teachers of England need knowledge of information and communication technologies, the ability to apply them in practice to teach literacy to students, as well as when teaching students with special educational needs, students from non-English families, students with deviant behavior.

In England, there is a portfolio system of teacher training with certain credit units [3]. To achieve this, the teacher annually agrees with the school principal or group leader on goals and priorities. Objectives should relate to professional development, provide for the improvement of teaching skills and include indicators of student achievement, which will indicate the effectiveness in meeting the objectives. At the end of the year, the results are compared with the stated goals.

To improve the skills of English teachers, short trainings, one-day (two-day) seminars, national weekly seminars, conferences for participants from different provinces are offered. Vocational training, which does not involve obtaining certificates, aims to enabling to get acquainted with new methods, technologies and approaches to teaching subjects (education), various aspects of cooperative learning, educational management, information and communication technologies, monitoring the activities of educational institutions and their development, etc.

In Poland, refresher courses are supplemented [4] by methodological seminars, round tables on the following issues: introduction of network technologies into the educational process, observance of uniform standards of computer technologies; connection to the world wide web of the Internet as many professional institutions as possible.

Teachers in the People's Republic of China are offered a variety of training programs [8]. These are courses for young teachers; level courses in accordance with the professional experience of the teacher; courses on the use of information technology in the field of teaching; refresher courses in the form of "menu" training (the teacher chooses from a variety of proposed disciplines those that have aroused his interest); courses for teachers of rural schools; courses with and without separation from professional activity; short-term and long-term, etc.

In accordance with the program of information society development in the People's Republic of China, the National Internet Alliance for Teacher Education has been established. It is a coordinating body for teacher education, which provides a synthesis of distance, full-time and self-education, and promotes the best educational resources. The purpose of the Internet Alliance is to implement a large-scale, high-quality, cost-effective project of effective postgraduate pedagogical education using modern technologies and various training programs.

Teachers of Japan are focused on permanent educational activities, as the country has established a rule [23] that pedagogical work can be arranged not for the formed ability to perform quality work, but for the desire and willingness to constantly learn, improve professional competence.

For teachers of Ukraine, improving professional skills in the use of information and communication technologies in the educational process is mandatory. In Article 12 "Complete general secondary education" of the Law of Ukraine "On Education" [13], information and communication competence is included in the list of key competencies necessary for every modern person for successful life. Also, mastering information and communication technologies is mandatory for the organization of training in various forms of education.

4 Conclusion

Thus, based on the analysis of foreign and domestic practices that are organized in continuing education, we can formulate the following conclusions:

1. The use of information and communication technologies has become an indispensable attribute of the organization of the learning process in continuing education in the digital age.

2. In the institutions of higher education and institutions of postgraduate pedagogical education in the process of education, the following are provided:

a) Study of the discipline "Modern information and communication technologies" (for institutions of higher education) or deepening knowledge of information and communication technologies and their application in the organization of student learning (institutions of postgraduate pedagogical education);

b) Teaching of other subjects (institutions of higher education) and advanced training in other disciplines (institutions of postgraduate pedagogical education) is organized with the use of information and communication technologies.

3. The use of information and communication technologies in foreign and domestic practices of higher education institutions is simultaneously:

a) A typical process (because it is observed in the activities of each teacher without exception);

b) Individual (because each teacher, organizing educational practices, introduces innovation in the use of information and communication technologies).

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