

Model Of Formation Of Digital Competence On The Basis Of Pedagogical Proceedings At The Present Stage Of Development Of Digitalization Of Society

Valentyna Lytvyn [†], Olena Khlystun ^{††}, Nataliia Prykhodkina ^{†††}, Iryna Poluboiaryna ^{††††},
Maryna Bezv ^{†††††}, Oleh Kopeliuk ^{†††††}

[†] Department of Pedagogy, Psychology, Primary Education and Educational Management, Ukraine

^{††} Department of Show Business Management, Kyiv National University of Culture and Arts, Ukraine

^{†††} Department of Pedagogy, Administration and Special Education, University of Education Management, Ukraine

^{††††} Department of Theory and methods of artistic education of Kharkiv National I. P. Kotlyarevsky University of Arts, Ukraine

^{†††††} Department at the general and specialized piano, Kharkiv National I. P. Kotlyarevsky University of Arts, Ukraine

Summary

The article discusses the pedagogical support for the formation of ICT competence assumes the individualization of students' training, due to their personal and professional needs and interests, and the provision of the necessary conditions and means to implement this process. A theoretical analysis is carried out and an analysis of experimental work on the implementation of the developed model for the formation of ICT competence is generalized specialists on the basis of pedagogical support.

Key words:

information technology, communication technologies, education system, educational process, ICT competence.

1. Introduction

The study of theoretical sources showed that the features of the formation of ICT competence of universities in the aspect of developing the content and organization of pedagogical support of this process have not been sufficiently studied.

Based on the analysis of scientific and pedagogical literature and pedagogical practice revealed the following contradictions:

- between the demand of the modern information society in specialists with the ability to use modern information technologies, and the need to develop scientific approaches to the process of forming the ICT competence of future university specialists;
- between the required level of formation of ICT competence of students and the insufficient potential of their preparedness in the real conditions of the university;

- between the need to ensure the effectiveness of the formation of the ICT competence of university students and the insufficient development of pedagogical support for the individualization of the learning process.

The above contradictions indicate the relevance of the research presented and determine the research problem, which consists in identifying and substantiating the features of pedagogical support for the formation of ICT competence university students.

Hypothesis: pedagogical support for the formation of students' ICT competence will be successful if:

- the educational process of the university will be aimed at the formation of students' ICT competence - as a basis for the development of their professional competencies;
- theoretically substantiated, developed and practically implemented a model of the formation of students' ICT competence on the basis of pedagogical support;
- the pedagogical conditions have been identified that contribute to the actualization of the motivational and value basis for the formation of students' ICT competence, the use of innovative ICT in teaching professional disciplines, personality-oriented orientation of pedagogical interaction.

2. Theoretical Consideration

A model of the formation of students' ICT competence based on pedagogical support in a university environment
The target block determines the goal and purpose of the model - increasing the efficiency of the formation of ICT competence of future specialists on the basis of

pedagogical support in the educational environment of the university.

Methodological block.

The process of the formation of students' ICT competence is based on the following approaches: systemic activity, competence-based, personality-oriented.

The organizational and content block characterizes the structural components of ICT: motivational-value, technological, cognitive, which determine the unity of information-theoretical and technological knowledge on the use of ICT in solving professional problems;

All components of ICT competence of future specialists interconnected with each other[1-3].

In theoretical terms, significant for us was the provision that ICT competence, being an integrative property, represents the unity of the statistical and dynamic aspects. Each component of ICT competence accordingly provides, on the one hand, stabilizing effect, and on the other - the dynamic capabilities of the individual in the development of new information technologies.

The dynamic side characterizes readiness as a state that is formed by the mechanism of an attitude at different levels of awareness, is emotionally experienced, consolidated and, taking the form of a semantic or social attitude, ensures the dominance of a certain system of personal value orientations.

The introduction of ICT into the educational process changes the goals and content, new methods and organizational forms of education appear.

Improving the content of education is associated with the formation of students' consistent, stable idea of their future professional activity.

The use of modern technologies in the educational process will be effective only if the correct idea of the place and role of these technologies in the educational process is formulated, which requires the solution of a whole range of educational, methodological, psychological, pedagogical and other tasks.

Pedagogical support for the formation of ICT competence of future specialists is carried out on the basis of the following principles:

consistency, priority of individuality and self-worth of the student, subject-subject relations of the teacher and the student, which contributes to the achievement of the planned results of mastering the educational program of higher education and creates the basis for independent successful assimilation of new competencies by students.

At the first, educational and cognitive stage, the goals and objectives of the educational activities of students are set, the existing changes, new formations in the intellectual, personal development of first-year students are analyzed, the results are analyzed and corrections are made to the learning process.

The second stage of pedagogical support for the formation of ICT competence is a practice-oriented stage, at which,

in our opinion, the acquired ICT competencies and personality traits find practical application in future professional activities.

The third stage of pedagogical support for the formation of ICT competence, we consider the scientific and professional, which is characterized by the fact that during the entire training period, future specialists activate the motivation for acquiring ICT competencies.

by involving them in the following forms of student scientific and professional activities:

educational and research work (reviews of scientific and technical literature, analysis, theoretically grounded decision);

research work (theoretical solution, computer modeling, planning and setting up an experiment, design, processing of results);

planned research work (problem statement, theoretical solution, modeling, performing standard experimental studies, processing results, solving problems).

In the process of pedagogical support, such technologies are used as the use of interactive methods in classrooms (information resource method, didactic games, project method, etc.), the author's special course "Information and communication technologies", scientific and practical web conferences, defense of engineering projects.

So, the combination of educational and cognitive with practice-oriented and scientific-professional work of students is the basis for the formation of ICT competence of students who have not only the necessary amount of knowledge, but also the skills of independent solution of new scientific and technical problems, prepared for work on a project in a team capable of adapting to future professional activities in a short time.

All these three stages are interrelated and complementary, since the formation of ICT competence is a continuous process, the effectiveness of pedagogical support of which is determined by the following pedagogical conditions:

actualization of the motivational and value basis for the formation of ICT - competence;

use of innovative ICT in teaching professional disciplines;

personality-oriented orientation of the educational process.

Updating the professional interest of students provides for the provision of a close connection of the educational process of the university with enterprises of this direction in order to implement practice-oriented learning; understanding by future engineers of the meaning and significance of information technology activities, awareness of the potential of ICT for future successful professional work [1-3].

The formation of reflexive skills in the learning process can be considered as the goal and strategy of learning, since the result of reflexive search is "actively constructed knowledge". It is related to the students' own interests and previously mastered experience, which lead to self-change, introspection and self-knowledge of their capabilities. At

the same time, reflexive management of educational activity is a combination of certain means and methods of achieving the goals set by the teacher and students in the course of their active construction of educational activities, based on the understanding of information and communication technologies that are significant for them.

The personality-oriented orientation of the educational process, in our opinion, provides for:

- taking into account the ethnocultural characteristics of students in the system education related to the economy and life support system, material and spiritual culture, mentality, stereotype;

- taking into account constraining factors in the process of forming ICT competence of future specialists – insufficient vocabulary, differences in culture, thinking, communication norms, reactions to the received information by graduates of rural schools;

- taking into account the ethnopsychological characteristics of students: calmness, silence, solitude, isolation, self-doubt;

- taking into account the ethnosocial and cultural characteristics of students: compact living, the desire not to stand out, dependence on the opinions of others.

These conditions, in our opinion, provide a stable and the purposeful nature of the process of forming students' ICT competence.

The reflexive block characterizes the criteria and indicators of the level of assessment of the formation of ICT competence.

To the criteria and indicators for assessing the level of formation professional ICT competence, we include:

professional orientation of the individual, reflecting motivation to successfully master the chosen profession, striving for self-organization and self-education, self-reflection;

readiness for professional ICT activities,

including the relevant skills and abilities, first of all, for the creation of an engineering product (resource) in the professional field using ICT;

readiness to implement professional knowledge and skills in ICT activities.

Considering the professional orientation of the student's personality as a priority component of professional competence in general and ICT competence in particular, we confirm the well-known thesis that modern education should be focused, first of all, on the personality of the future specialist.

It is generally accepted that each profession has a set of psychological to physical qualities of an individual, and the success of mastering a profession is in direct proportion to the degree of correspondence between individual qualities and requirements for the profession [4,6,8].

Accordingly, there is a problem of the subjective difficulty of the individual in resolving the issue of combining his

personal psychological characteristics of orientation with the social significance of the profession.

Therefore, the content of professional education should satisfy the interest of the individual in the chosen profession and the formation on this basis of more and more conscious motives for future professional activity.

Let us give a general description of the indicated levels of formation of ICT competence in professional activity in the context of multimedia and network learning[10,12].

The first level is introductory and reproductive. This level is characterized by students' possession of only certain knowledge and skills that make up their initial computer literacy. These include communication with peers from other universities through a local and telecommunication network, work on educational sites, search for special information, etc.

The second level is search and cognitive. This level of training of students is characterized by their sufficient degree of computer literacy, which allows them to successfully master the information technologies of future professional activities. This is the possession the necessary skills to work with computer engineering programs, information infrastructures and Internet resources, the development of existing ones and the acquisition of specific personal qualities and information culture communication in the context of digitalization of space.

The third level is professional and creative, characterized by the ability of students to effectively use information technologies in future professional activities: creating a product (resource) in a specific professional area using computer tools an individual route through educational web servers, the ability of students to generate a new, original idea, to correlate it with the existing analogues presented in infocommunication technologies as well as reflection by students about the achieved educational results.

All three levels of formation of students' ICT competence are interconnected with each other, each previous one determines the next one, being included in its composition. Thus, the student moves from familiarization-reproductive through search-cognitive to professional and creative level of ICT competence formation in professional activity.

It should be noted that the model we have developed for the formation of students' ICT competence on the basis of pedagogical support is based on the electronic information and educational environment of the university, in which the entire educational process is carried out.

It should be noted that, like any competence, ICT competence is dynamic, i.e. constantly developing and changing personality traits through:

self-renewal, the emergence of new forms and ways satisfying the information needs of subjects adapting ICT competence to changing conditions generated by the creative initiative of the individual, the logic of ICT development in a particular field of activity;

self-development, complication of ICT competence itself; deepening the specialization of individual elements and their level interconnection and interaction with each other[9,13].

Conclusions

Thus, the development of the information society, which qualitatively changes the conditions of life and professional activity of a person, has actualized the problem of preparing future specialists for new conditions on the basis of the formation of their information and communication competence;

ICT competence is considered as the most important characteristic of professional competence,

including a set of the following components: motivational-value (orientation of the student's personality to the development of his ICT competence in future professional activities);

technological (complex of skills and abilities of ICT activities);

cognitive (the system of knowledge of modern technologies); features of the process of forming ICT competence future engineers: actualization of the potential opportunities of the educational process through the introduction of interactive teaching methods, conditioned by the requirements of professional activity;

activation of practice-oriented project-based learning, in particular project-research activities related to the functioning objects of professional activity; an individual approach due to the specifics of a regional university (low level of computer literacy among freshmen);

pedagogical support for the formation of ICT competence of future specialists acts as a purposeful pedagogical activity, including the appropriate content, a set of methods and forms of training and education, the result of the implementation which is the achievement of a certain level of professional competence and personal self-development;

model of formation of ICT competence based on pedagogical support, which is complex a pedagogical system, designed on the basis of a competence-based approach, taking into account the regional characteristics of students, includes a target block (the goal and purpose of the model is to increase the effectiveness the formation of students' ICT competence in the educational environment of the university);

methodological block (system-activity, competence-based, personality-oriented);

reflexive block (criteria for assessing the level of formation of professional ICT competence: professional orientation of the individual, striving for successful mastering of the chosen profession, self-organization and self-education, self-reflection; readiness to implement professional knowledge and skills in ICT activity; readiness for professional ICT activity (corresponding skills and abilities, first of all, for creating an engineering product (resource) in a

professional field using ICT), and levels the formation of ICT competence (introductory and reproductive, search and cognitive, professional and creative).

Thus, pedagogical support for the formation of ICT competence presupposes the individualization of students' learning, due to their personal and professional needs and interests, and the provision of the necessary conditions and means to implement this process.

References

- [1] Corral, S. (1998). Key skills for students in higher education. *SCONUL Newsletter*, 15, 25-29.
- [2] Frolov, D., Radziewicz, W., Saienko, V., Kuchuk, N., Mozhaiev, M., Gnusov, Y., & Onishchenko, Y. (2021). Theoretical And Technological Aspects Of Intelligent Systems: Problems Of Artificial Intelligence. *International Journal of Computer Science and Network Security*, 21(5), 35-38. DOI10.22937/IJCSNS.2021.21.5.6.
- [3] Meera N. S. Quality education for all? A case study of a New Delhi government school, *Policy futures in education*, 2015, № 13 (3), pp. 360–374.
- [4] Lazorko, O., Virna, Z., Brytova, H., Tolchieva, H., Shastko, I., & Saienko, V. (2021). Professional Safety of Personality: System Regularities of Functioning and Synergetic Effects of Self-Organization. *Postmodern Openings*, 12(2), 170-190. <https://doi.org/10.18662/po/12.2/302>.
- [5] Alfred P. Rovai, Linda D. Grooms The relationship of personalitybased learning style preferences and learning among online graduate students. *Journal of Computing in Higher Education*. - 2004. - №16, Issue 1. - pp 30- 47.
- [6] Andrea Santo-Sabato, Marta Vernaleone From the First Generation of Distance Learning to Personal Learning Environments: An Overall Look. *E-Learning, E-Education, and Online Training*. - 2014. - №138. - C. 155-158.
- [7] Shapiro, J., & Hughes, S. K. (1996). Information literacy as a liberal art: Enlightenment proposals for a new curriculum. *EDUCOM Review*, 31(2), 31-35.
- [8] McMillan R. Man Builds Twitter Bot That Humans Actually Like. *Wired*. URL: wired.com/2012/06/twitter_arm/
- [9] Mason, R. *Globalising Education: Trends and Applications*. London: Routledge, 1998. P. 37.
- [10] Biddiscombe, R. (1999). Developing the learning support role: Some of the challenges ahead. *SCONUL Newsletter*, 16, 30-34.

- [11] Iasechko, M., Shelukhin, O., Maranov, A. Evaluation of The Use of Inertial Navigation Systems to Improve The Accuracy of Object Navigation. *International Journal Of Computer Science And Network Security*, 21:3, 2021, p. 71-75.
- [12] Dordick H.S., Wang G. *The Information Society: A Retrospective View*. Newbury Park — L., — 1993.
- [13] Iasechko, M., Iasechko, S., Smyrnova, I. Aspectos pedagógicos do autodesenvolvimento de alunos de educação a distância na Ucrânia. *Laplage Em Revista*, 7(Extra-B), 2021, p.316-323.