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PEDAGOGICAL PRINCIPLES FOR EFFECTIVELY USING INFORMATION AND COMMUNICATION TECHNOLOGIES TO PREPARE HIGHER EDUCATION STUDENTS PROFESSIONALLY

PRINCIPIOS PEDAGÓGICOS PARA EL USO EFICAZ DE LAS TECNOLOGÍAS DE INFORMACIÓN Y COMUNICACIÓN EN EDUCACIÓN SUPERIOR PROFESIONAL

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ABSTRACT

This article clarifies theoretical and methodological approaches to the organization and structure of the educational process in higher education using ICT. Existing models for the implementation and application of ICT training for developing students' professional competencies, used in Ukrainian universities, are analyzed. A model for the effective application and content of ICT training at a university, ensuring the effective development of students' professional competencies, is developed. Recommendations are provided for the further implementation of ICT training tools in the development of students' professional competencies at Ukrainian universities. This paper contributes to the theory and practice of using ICT in higher education. It has been established that systemic, activity-based, and competency-based approaches to ICT use at universities ensure the effective development of students' professional competencies. The importance of ICT competence among educational participants (faculty and students) in the effective use of electronic educational resources and the university's information and educational environment has been clarified. Scientific and methodological understanding of the process of using ICT in higher education, based on the principles of continuity and uninterrupted information training for students, has been expanded, enabling optimal solutions to a range of scientific and practical problems related to ICT use in education.

Keywords:

Information and Communication Technologies, Higher Education, Professional Skills, Competency-Based Approach, Activity-Based Approach.

RESUMEN

Este artículo clarifica los enfoques teóricos y metodológicos para la organización y estructura del proceso educativo en la educación superior mediante las TIC. Se analizan los modelos existentes para la implementación y aplicación de la formación en TIC para el desarrollo de competencias profesionales de los estudiantes, utilizados en universidades ucranianas. Se desarrolla un modelo para la aplicación efectiva y el contenido de la formación en TIC en una universidad, asegurando el desarrollo eficaz de las competencias profesionales de los estudiantes. Se proporcionan recomendaciones para la implementación futura de herramientas de formación en

TIC en el desarrollo de las competencias profesionales de los estudiantes en universidades ucranianas. Este trabajo contribuye a la teoría y la práctica del uso de las TIC en la educación superior. Se ha establecido que los enfoques sistémicos, basado en actividades y basado en competencias para el uso de TIC en las universidades garantizan el desarrollo efectivo de las competencias profesionales de los estudiantes. Se ha clarificado la importancia de la competencia en TIC entre los participantes del proceso educativo (docentes y estudiantes) para el uso eficaz de los recursos educativos electrónicos y del entorno informativo y educativo de la universidad. Se ha ampliado la comprensión científica y metodológica del proceso de uso de las TIC en la educación superior, basada en los principios de continuidad y formación informativa ininterrumpida de los estudiantes, permitiendo soluciones óptimas a diversos problemas científicos y prácticos relacionados con el uso de las TIC en la educación.

Palabras clave:

Tecnologías de Información y Comunicación, Educación Superior, Competencias Profesionales, Enfoque Basado en Competencias, Enfoque Basado en Actividades.

INTRODUCTION

Education in the 21st century places special demands on the use of various types of technology, as their application produces highly skilled professionals in demand in the labor market, taking into account development strategies for various market sectors and in accordance with modern scientific, engineering, and technology requirements (León-González & Pire-Rojas, 2025).

Since Ukraine embarked on a course toward integration into the international economic space, a situation arose in which it was necessary to close the gap between the need for highly qualified personnel and the quality of their training. This problem has become more acute with the emergence and implementation of new technologies in all sectors of life and the economy, a significant portion of which are related to the computerization of various social and production processes. This primarily concerns information and communication technologies (ICT).

It is becoming clear that training new specialists and equipping them with modern competencies capable of making them competitive in the global labor market requires the use of new methods, tools, and forms of training capable of meeting the modern requirements of employers. The integration of ICT, both in the education and training of future professionals and in quality control and management activities within the higher education system, has become a recognized necessity, as mastering new skills in modern, scientific, and professional technologies requires the use of equally advanced or equivalent technologies. Effective use of ICT opens up new opportunities and prospects for the development of the education system as a whole (Chávez et al., 2025; Jandette et al., 2024).

This entire range of issues underlies the relevance of studying the effectiveness of ICT content and the impact of ICT used in the educational process at Ukrainian universities on the development of the necessary competencies of graduates.

In global pedagogical science, issues related to the use of ICT in the university learning process and the development of student competencies have been studied quite well from various perspectives, both by individual researchers and by government and international organizations (Farrel, 1999; Littlejohn et al., 2016; Lunenburg & Ornstein, 2011; Pellini & Bredenberg, 2015).

Among the international experts who have recently studied the ICT competencies of university students are the following works: (Alexander et al., 2019; Balzer, 2010; Gioffre, 2017; Iasechko & Iasechko, 2024).

The problems of the influence of ICT on the formation of students' competencies are widely presented in the research of such scientists as: (Iasechko et al., 2021; Wolfe & Andrews, 2014).

In Ukrainian pedagogical science, the use of ICT in the teaching of university students and the development of their professional competencies has only recently begun to be considered. Despite this, numerous studies by Ukrainian scholars and specialists have emerged in the scientific community addressing the issues of ICT implementation in the Ukrainian education system.

Among the Ukrainian scholars who have developed various aspects related to the topic of this article, the following research is noteworthy: (Bahno, 2024; Khmelnytska et al., 2021).

However, despite the great interest shown by scientists in the problem of using ICT in education, an analysis of the activities of Ukrainian universities has shown that one of the least developed issues in pedagogical science and higher education practice remains the problem of developing the professional competencies of university students in the context of using ICT.

The **purpose** of the study is to identify the features of the organization, structure and content of the use of ICT training in the formation of professional competencies of students of Ukrainian universities.

The **object** of this study is the higher professional education system in Ukraine.

The **subject** of this study is the development of professional competencies in university students using ICT.

MATERIALS AND METHODS

The study's hypothesis is that the content and ICT-based learning environment in Ukrainian universities will contribute to the effective development of students' professional competencies if:

- infrastructure and personnel changes related to ICT implementation in higher education are diversified following the transition to the Bologna system;
- a high level of faculty ICT competence is ensured, facilitating the effective development of students' professional competencies;
- specific competencies related to the use of ICT are developed in Ukrainian university graduates to ensure their competitiveness;
- activities to create an information and educational environment for universities to organize student learning using ICT are intensified;
- relevant models of effective content and ICT-based learning at universities are implemented in the higher education system.

To confirm the hypothesis and achieve the research objective, a number of specific research objectives were formulated and addressed:

1. To examine the theoretical foundations of ICT application in higher professional education.
2. To study general issues of ICT use in developing necessary competencies and skills in students at higher professional education institutions.
3. To study the organizational and pedagogical conditions and criteria for developing ICT competence in university students.
4. To examine general issues of standardizing the implementation of ICT teaching tools for developing the professional competencies of future specialists in Ukrainian universities.
5. To study the general organization of ICT instruction and the effectiveness of ICT instructional content at Ukrainian universities.

The methodological basis of the study is based on principles developed within the framework of systemic, activity-based, and competency-based approaches, theoretical principles in pedagogy and psychology of the educational environment, research and reviews on the theory and methodology of informatization of education, and the use of ICT-based learning in higher education.

To address the research objectives, the following general and specialized scientific methods were used:

empirical methods (observation, description, survey, modeling);

theoretical analysis methods

(retrospective, comparative, and systemic);

statistical data processing methods;

theoretical analysis of scientific and pedagogical literature;

analysis of educational standards and training programs in information and professional disciplines.

RESULTS AND DISCUSSIONS

The theoretical foundations for developing educational environment content in the context of the implementation of information and communication technologies for teaching systematize the key concepts of the subject area, examine the nature, content, and characteristics of problems associated with the use of ICT in developing university students' competencies, and identify organizational and pedagogical conditions and criteria for developing ICT competence in university students.

The educational environment is the environment in which students develop specialized skills.

The educational environment is understood as the functioning process of a specific educational institution (Bray, 2007; Leighton & Griffioen, 2023).

The essence of the educational environment at a university boils down to its consideration as a factor necessary for the development of students' professional competencies.

In modern pedagogical science, the term «information and educational environment» (IEE) began to actively appear in scientific and educational discourse in the second half of the 1990s.

A university's IEE is viewed as a combination of informational, methodological, and technical aspects, i.e., both human-to-human interaction using ICT and human-to-computer interaction, i.e., the acquisition of knowledge directly using ICT.

An IEE is multicomponent and includes both organizational and methodological tools and a wide range of technical means and software designed to store, process, and transmit information, as well as enabling communication between instructors and students. An IEE is based on three components: information and educational resources, computer-based learning tools, and an educational process management system.

One of the fundamental objectives of the higher professional education system is to develop ICT skills and abilities in future specialists, as well as the ability and readiness to use them in their future professional activities.

Training highly qualified specialists requires modernizing the educational process at universities, taking into account current technological developments, and providing students with the necessary competencies for their rapid integration into the modern digital technological society.

Competence is the mastery of a specific subject area, the ability to think in its categories, and a complex (set) of knowledge, abilities, and skills developed during the learning process.

Competence is a specific personal development that determines a subject's ability to perform any activity based on the developed competency (or set of competencies).

The structural chain of stages for developing readiness (competence) in a student is as follows: awareness (elementary readiness), literacy (general readiness), preparedness (functional readiness), and competence (systemic readiness). The model for the sequential development of student ICT competence consists of motivational, cognitive, and activity-based components.

Based on these components, we have identified a set of organizational and pedagogical conditions for developing ICT competencies in university students that can lead to a high level of development. These conditions include the following:

development and implementation of a program aimed at ensuring the methodological readiness of university faculty to develop students' ICT competence;

implementation of substantive and organizational changes to the university's information and educational environment;

organization of students' project-based and creative (including independent) activities using ICT.

Furthermore, during our study, we identified additional components influencing the development of university students' ICT competence, which can be classified as organizational and pedagogical conditions:

the university's information and educational environment;

the instructor's ICT competence;

the organization of students' lectures and independent activities.

We especially note that all components are interconnected and directly influence the development of students' ICT competencies. Moreover, one of the most important aspects influencing the development of university students' ICT competencies is the creation of an appropriate information and educational environment at the university.

It is important to note the interconnectedness of all the organizational and pedagogical conditions listed above, as well as their direct influence on the criteria for developing ICT competencies. Comprehensive and appropriate implementation of these conditions directly during the educational process will ensure the most complete readiness of students, as future specialists, to apply ICT in their future professional activities. Thus, based on the above provisions, the criteria for assessing students' ICT competencies follow. These include primarily cognitive, activity-practical, communicative, organizational, motivational-value, and reflexive-volitional criteria, which influence student competency indicators such as learning, creativity, professional mobility, reflectivity, and others (Meniailo et al., 2021).

Based on the above, we believe that the development of university students' ICT competencies is the result of the simultaneous influence of two factors:

1) specific organizational and pedagogical conditions (including the ICT competence of the instructor), through which the student receives initial information from outside, as well as guidance and supervision from the instructor, and the methodological structure and technical organization of lectures, which develop the necessary ICT competencies;

2) internal self-organization of the student, his independent work aimed at self-improvement and self-development of acquired ICT competencies and their application in future professional activities.

The issue of creating an infrastructure that enhances the competencies of university students is closely linked to the overall problem of informatization of education.

The informatization infrastructure of a university encompasses a wide range of elements, from the availability of computers and other equipment, internet connectivity for the educational process, to the organization of the university's information and information system (IIS). Currently, it can be concluded that Ukraine has successfully resolved virtually all infrastructure issues.

The development of a unified university management information system (UMS) represents a new stage in the evolution of the technological organization of IIS in Ukrainian universities and the use of ICT to enhance students' professional competencies.

The general model of a university's IEE looks like this:

Faculties > Special Classes > Departments > Workplaces

An important organizational point in the model of elements influencing the development of professional competencies in university students is the necessary competence of the teachers themselves.

There are a number of parameters, indicators, or criteria that most significantly influence the effectiveness of education at a university, and ICT is a factor in most of them.

In terms of the effectiveness of ICT in influencing the perception of educational material by university students, they are divided into two large groups, the difference between which lies in the use of external networks to connect to communication sources (Figure 1).

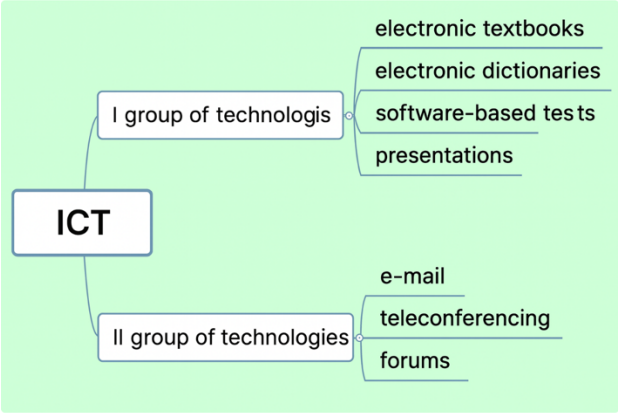

Figure 1. Classification of ICTs that influence the effectiveness of perception of educational material by university students.

Based on the analysis of the works of a large number of researchers and specialists, as well as the practice of using ICT training in Ukrainian universities, we have developed a model for the effective use and content of ICT training in universities directly related to the development of students' competencies (Figure 2).

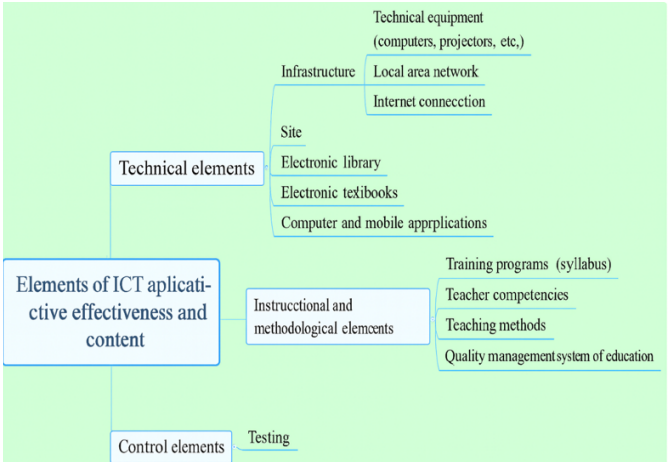

Figure 2. A model for the effective use and content of ICT training in universities.

Within the framework of the developed model, we analyzed integrated indicators of information society development in the «ICT use» area for Ukraine (based on research conducted at the World Summit on the Information Society).

However, it is regrettable to note that Ukraine's integrated indicators in the «e-research» and «e-education» areas are below the EU average, particularly in areas such as ICT infrastructure, access to information and knowledge, and human development (one aspect of which is improving students' ICT competence). We particularly note that e-education is one of the most promising areas for the effective use of ICT. In this regard, we would like to highlight the entire cluster related to mobile communications and the delivery of education through mobile applications and mobile communications.

The results of the study showed that 64% of respondents in Ukraine use smartphones in their daily lives, 77% access the internet via mobile phones, and, most importantly, use mobile devices for educational purposes.

In our study, we analyzed the experience of Ukrainian universities with online resources or open educational resources (OER), which do not require downloading to mobile or desktop computers or communication devices. Internet access is all that is required to access these educational resources.

Our analysis of OER use in Ukraine revealed a number of shortcomings:

weak technical support and support for OER;

lack of reliable access to some OER;

lack of adaptation of OER materials to various devices, etc.

However, despite these problems, the overall situation in Ukrainian higher education demonstrates some progress in the use of ICT in the educational process at universities. Based on the results of our study, we reached the following conclusions and generalizations:

The Ukrainian higher education system faces an important task related to developing students' ICT competencies.

This demonstrates the dual nature of ICT in its application in higher education. This duality primarily manifests itself in the acquisition of necessary competencies by students through ICT, while at the same time, one component of these competencies is the direct application of ICT. Thus, during the learning process, one aspect of ICT application is the acquisition of competencies for their application in everyday life and in the workplace.

One type of educational environment that is directly focused on the use of ICT as an educational element designed to develop the necessary competencies in students is a university's IEE (Bekirova & Harabadjah, 2020).

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A university's IEE has its own methodological framework, but its main feature is the use of technical and software capabilities for processing, storing, transmitting, and presenting information and educational materials. Furthermore, an IEE creates additional opportunities for communication and interaction between faculty and students, regardless of distance. Thus, a student located on one side of the world can attend lectures by the most leading experts in their field, regardless of their location. Modern society places new demands on future specialists who can harmoniously fit into modern labor markets and find their place as professionals.

It's not enough for a modern student to simply possess a set of factual professional knowledge in a specific field. They must now be able to independently identify and formulate a problem, find the necessary information, analyze the data, and develop the most optimal solutions.

To achieve these goals, given the large volume of information required for analysis and processing, information systems are used, which require students to possess a high level of ICT competencies (Meniailo et al., 2021).

However, ICT competency requirements apply not only to students. Equal requirements apply to university instructors, who must be able to use computer technology and ICT-based learning to organize and conduct university classes, ensuring effective student learning.

Another aspect of using ICT in education is the ability to provide students with greater opportunities

to utilize various information sources and to be independent in their learning, aimed at effectively developing professional competencies. This aspect is largely associated with the opportunities offered by the Internet, interactive and educational programs, and the use of hypertext, multimedia, network, and communication technologies in the creation of electronic educational resources (electronic textbooks and teaching aids).

Thus, computer and information literacy are becoming a key aspect of ICT use in the educational process at universities. In the context of the discussed issues related to the use of ICT in higher education, we are inclined to note that in this context, ICT competencies are among the most important competencies that need to be developed in university students. This requires a combination of four key elements: teaching methodology, teaching aids, appropriate organizational forms (independent work, specialized courses, scientific and practical conferences, etc.), as well as pedagogical and information technologies (computer and interactive learning technologies, etc.).

To maximize the impact of educational IT on the development of students' ICT competencies, it is necessary to apply it thoughtfully, taking into account a competency-based approach, as well as clearly standardize the measures taken by the relevant government agencies.

In our opinion, centralized governance of the national education system, as it exists in Ukraine, can ensure a comprehensive and balanced innovation process, as well as the integration of ICT into the educational process at universities by adopting appropriate standards and requirements for the professional competencies of university graduates.

Despite the adoption of a number of policy documents aimed at overcoming ICT challenges, which have led to the high technological level of many Ukrainian universities and the increase in students' ICT literacy, objective studies show the unevenness of this process within the country. Unfortunately, Ukraine's overall ranking in ICT development, compared to other countries, remains low. To overcome these shortcomings, we can offer a comprehensive set of modern approaches to ICT application in higher education that will maximize student acquisition of relevant competencies.

These areas include:

development of electronic libraries;

development of electronic textbooks;

development of open educational resources;

creation of educational computer programs and mobile applications;

improving faculty ICT competencies.

This, in turn, will facilitate the development of professional competencies among university graduates in the labor market.

As a result of our analysis and research into the effective use of ICT in the educational process at universities, we have developed a comprehensive set of models whose implementation and application will contribute to improving the quality of education at Ukrainian universities.

It is also important to note the importance of ICT in education, such as the creation of electronic and multimedia textbooks, electronic libraries, and open educational resources in universities.

These elements will contribute to the development of the following characteristics of the Ukrainian educational system:

creating conditions for expanding access to education;

developing innovative forms and types of educational practices, which will enable the effective use of the principle of continuity in education;

creating conditions under which the knowledge acquired by students can develop competencies in the form and scope required by the individual student;

creating a broader framework for organizing an individualized approach to developing students' professional competencies;

creating conditions for engaging a broad community of professionals in the educational process, which will contribute to the development of the education system in Ukraine.

Developing ICT competencies of teachers is a separate issue, as it is the university faculty that bears the primary burden of developing these competencies in students. Based on the above, the following recommendations can be made:

intensify efforts to create electronic educational resources, textbooks, and electronic libraries in Ukraine;

create a unified standard for electronic educational resources based on best international practices;

amend educational programs to develop student competencies in the application of ICT educational capabilities or, alternatively, introduce specialized courses to develop such competencies;

regularly conduct professional development courses for university faculty in ICT and standardize the ICT competencies required of faculty.

Naturally, our study cannot be exhaustive and is considered one possible solution to the problems of using ICT training in developing university students' professional competencies. Further research could be conducted, with the results of this study serving as the main thesis.

CONCLUSIONS

The study analyzed the current state of quality management systems for the use of ICT in higher education, highlighting their impact on the development of students' professional competencies in Ukrainian universities. Structural and functional models for organizing the information and educational environment were examined, identifying key factors that influence their effectiveness and the overall learning experience.

Effective models for ICT application and content were developed, along with organizational and pedagogical elements that facilitate the acquisition of professional competencies by students. The study also provided recommendations and perspectives for the comprehensive and efficient implementation of ICT in the quality management of higher education in Ukraine.

From a theoretical perspective, this research contributes to the development of ICT-based learning theory and practice in higher education. It confirms that systemic, activity-based, and competency-based approaches ensure the effective development of students' professional competencies. Furthermore, it emphasizes the critical importance of ICT competence among both faculty and students for the effective use of electronic educational resources and the university's information and educational environment.

Finally, the study expands the scientific and methodological understanding of ICT-based learning in universities. By applying the principles of continuity and adequacy in students' information training, the research enables optimized solutions to complex scientific and practical problems related to ICT use in education, supporting the formation of digitally competent and professionally prepared graduates.

REFERENCES

Alexander, B., Ashford-Rowe, K., Barajas-Murphy, N., Dobbin, G., Knott, J., McCormack, M., Pomerantz, J., Seilhamer, R., & Weber, N. (2019). ***EDUCAUSE Horizon Report: 2019 Higher Education Edition***. EDUCAUSE.

Bahno, Y. (2024). ***Optimization of the educational process of a higher school in conditions of mixed learning***. https://ibn.idsi.md/sites/default/files/imag_file/139-144_29.pdf

Balzer, W. K. (2010). ***Lean higher education: Increasing the value and performance of university processes***. Productivity Press.

Bekirova, E. S., & Harabadjah, M. N. (2020). Model formation of future teachers readiness to innovative activity. ***Revista Amazonia Investiga, 9***(29), 22–28. https://doi.org/10.34069/AI/2020.29.05.3

Bray, M. (2007). ***The shadow education system: Private tutoring and its implications for planners*** (2nd ed.). UNESCO International Institute for Educational Planning. https://unesdoc.unesco.org/ark:/48223/pf0000118486

Chávez-Cárdenas, M. d. C., Fernández-Marín, M. Á., & Lamí-Rodríguez del Rey, L. E. (2025). ***Web educativa e inteligencia artificial: Transformando el aprendizaje contemporáneo.*** Sophia Editions.

Farrel, G. (1999). The development of virtual education: A global perspective. The Commonwealth of Learning. Vancouver: Canada

Gioffre, M. (2017). ***Educational leadership and the challenge of inclusion: A study of primary school principals in Italy*** [Doctoral dissertation, University of Leicester].

Iasechko, M., Iasechko, S., & Smyrnova, I. (2021). Aspectos pedagógicos do autodesenvolvimento de alunos de educação a distância na Ucrânia. ***Laplage Em Revista, 7***, 316–323. https://laplageemrevista.editorialaar.com/index.php/lpg1/article/view/929

Iasechko, S. & Iasechko, M. (2024). The role and impact of artificial intelligence in modern education: Analysis of problems and prospects. ***Review of Artificial Intelligence in Education,*** *5*(00), e26. https://doi.org/10.37497/rev.artif.intell.educ.v5i00.26

Jandette-Castillo, N. M. & Ruiz-Maturano, E. S. (2024). El aprendizaje automático con el uso de las Tecnologías de la Información y las Comunicaciones. ***Sophia Research Review***, *1*(1), 15-19. https://doi.org/10.64092/hxw9g912

Khmelnytska, O. S., Bahno, Y. M., Serhiichuk, O. M., Tkachenko, L. V., & Tanana, S. M. (2021). Features of pedagogical practice in the process of professional training of a future teacher. ***Revista Geintec-Gestao Inovacao e Tecnologias,*** *11*(4), 2049–2065. https://revistageintec.net/old/wp-content/uploads/2022/03/2253.pdf

Leighton, R. H. & Griffioen, D. M. E. (2023). Lecturers' curational behaviour in higher education. ***Teaching in Higher Education,*** *28*(6), 1207–1226. https://doi.org/10.1080/13562517.2021.1872530

León-González, J. L. & Pire-Rojas, A. (Comp). (2025). ***Investigación, neurociencia e inteligencia artificial: Hacia una formación universitaria integral***. Sophia Editions.

Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. ***The Internet and Higher Education,*** *29*, 40–48. https://doi.org/10.1016/j.iheduc.2015.12.003

Lunenburg, F. C. & Ornstein, A. C. (2011). ***Educational administration: Concepts and practices*** (6th ed.). Wadsworth, Cengage Learning.

Meniailo, V., Shapran, Y., Shapran, O., Serhiichuk, O., Bahno, Y., & Kanibolotska, O. (2021). Innovative training of future teachers of higher education institutions in the conditions of distance learning. ***Revista Romaneasca Pentru Educatie Multidimensionala,*** *13*(2), 288–303. https://lumenpublishing.com/journals/index.php/rrem/article/view/3861

Pellini, A. & Bredenberg, K. (2015). Basic education clusters in Cambodia: Looking at the future while learning from the past. ***Development in Practice,*** *25*(3), 488–502. https://doi.org/10.1080/09614524.2015.1018138

Wolfe, J. & Andrews, W. (2014). The changing roles of higher education: Curator, evaluator, connector and analyst. ***On the Horizon,*** *22*(3), 210–217. https://doi.org/10.1108/OTH-05-2014-0019