Presentation date: November, 2024 **Date of Acceptance:** December, 2024 **publication Date:** January, 2025

FORMATION OF DIGITAL LITERACY SKILLS OF STUDENTS IN INSTITUTIONS OF HIGHER EDUCATION

FORMACIÓN DE HABILIDADES DE ALFABETIZACIÓN DIGITAL DE ESTUDIANTES DE INSTITUCIONES DE EDUCACIÓN SUPERIOR

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Suggested citation (APA, seventh ed.)

Slipenko, V., Chornobryva, N., Rokosovyk, N., Koshuk, O., Bodnaruk, I., y Oros, I. (2025). Formation of digital literacy skills of students in institutions of Higher Education. *Revista Conrado, 21*(102), e4235.

ABSTRACT

The essence and importance of digital literacy among students of higher education institutions are revealed. the main elements of the content of "digital literacy" and concepts that include digital literacy are shown. The main aspects in which students' digital literacy is formed are shown. The basic competencies required for the updated Digital Competence framework (DigComp 2.0) are described. The main issues of preparing young people for digital citizenship in the conditions of a modern educational environment of a higher school are grouped. The most effective online media literacy courses for independent study of the material in forming students' digital literacy skills are named, and the main components and elements of a student's digital literacy are highlighted. The ways and characteristic features of creation are shown, and the necessity and possibilities of a digital educational environment for the formation of digital literacy skills of students in higher education institutions are shown. In the process of research, to determine the level of digital literacy of higher school students, we assessed the level of practical mastery of digital technologies of future specialists with the help of a questionnaire. It was established that the majority of respondents have an average level of digital literacy.

Keywords:

Tecnologías de la información, educación, instituciones de educación superior, tecnologías STEAM, sistema orientado a la nube de uso de tecnologías de la información.

RESUMEN

Se revela la esencia e importancia de la alfabetización digital entre estudiantes de instituciones de educación superior. Se muestran los principales elementos del contenido del concepto de "alfabetización digital" y conceptos

que incluyen la alfabetización digital. Se muestran los principales aspectos en los que se forma la alfabetización digital de los estudiantes. Se describen los bloques básicos de competencias requeridas para el marco de Competencia Digital actualizado (DigComp 2.0). Se agrupan las principales cuestiones de la preparación de los jóvenes para la ciudadanía digital en las condiciones de un entorno educativo moderno de una escuela superior. Se nombran los cursos de alfabetización mediática en línea más eficaces para el estudio independiente del material en el proceso de formación de las habilidades de alfabetización digital de los estudiantes y se destacan los principales componentes y elementos de la alfabetización digital de un estudiante. Se muestran las formas, rasgos característicos de la creación y la necesidad y posibilidades de un entorno educativo digital para la formación de habilidades de alfabetización digital de los estudiantes de instituciones de educación superior. En el proceso de investigación, con el objetivo de determinar el nivel de alfabetización digital de los estudiantes de secundaria, evaluamos el nivel de dominio práctico de las tecnologías digitales de los futuros especialistas mediante un cuestionario. Se estableció que la mayoría de los encuestados tienen un nivel medio de alfabetización digital.

Palabras clave:

Tecnologías de la información, educación, instituciones de educación superior, tecnologías STEAM, sistema orientado a la nube de uso de tecnologías de la información.

INTRODUCTION

The transition from an information society to a digital society is one of the trends in the development of the modern world, characterized by the need to transfer and store large data sets of the most complex digital technologies; wide use of local and global computer networks; expansion of the field of communication, etc. Digital transformation has had a significant impact on higher education, covering all areas of society (economy, science, service, industry, culture, etc.) (Hurevych et al., 2024).

Therefore, in the context of lifelong learning, the digital literacy of the individual is recognized as one of the key factors for the 21st century, which, in particular, refers to the ability to use digital technologies creatively and critically for the self-realization of the individual. Without a doubt, the ability of young people in the context of building a sustainable development society is extremely important – implementation of digital entrepreneurship and social projects that determine the formation of important qualities in an individual (interaction, initiative, empathy, creative cooperation) (Oliynyk et al., 2017)

Modern society lives amid the digital revolution. Today, more people are connected to the Internet than ever before. People use services and digital devices to maintain and work in various aspects of their own lives, therefore knowledge of digital literacy is necessary in our time because it is becoming one of the priorities of modern education. The formation of digital skills carries a great moral, and intellectual, great potential for personal development, and not only promotes free and stronger practical knowledge. When studying digital literacy, the modern future specialist not only confirms the importance of the specialty for the realization of future tasks in society but is also the subject of recognition of objectively existing social interest. Mastering the skills of independent research, critical thinking, and in-depth analysis is the result of the training of a modern specialist. The most important factor in achieving all these goals is the formation of motivation to study digital literacy. To maximize the readiness of the future specialist to invest his own resources and time in the process of learning digital literacy, the student must understand the problems that will help him solve the professional tasks of the educational process, all the advantages he will have as a result of learning digital literacy, what he will do better in the future workplace (Sukhomlyn, 2021).

Literature review

Theoretical-methodological and applied problems of higher education, the formation of digital literacy skills among students of higher education institutions, and conceptual ideas for improving the professional training of students are actively researched by scientists from different countries.

The concepts of “digital literacy” and “digital competence”, which are professional qualities for students of higher education, are revealed in the works of M. Zakharevych, & V. Hryhorenko (2024). For students of higher education, it is shown the need to use an active, targeted, effective, information system in the educational space, which will help students develop digital skills during their studies. The digital competence of the future specialist is presented as an opportunity to use digital technologies creatively and critically. In the field of digital competence, the formation of digital literacy accumulates the following abilities: the ability to evaluate and search for information, knowledge of basic operational skills, the ability and creativity to work together, the ability to analyze and process data, present information and protect privacy, and be aware of information security.

The work of Hurevych et al. (2024) is devoted to the applied and theoretical aspects of pedagogical support for the personal and professional development of future competitive specialists in the conditions of the educational digital environment of a higher school. Scientists have

analyzed approaches to determining the content and essence of the phenomenon of the digital environment of a higher school, presented the characteristics of the personal and professional development of students, and their pedagogical support, taking into account the type of environment where training takes place (content, technology, directions of professional growth, stages). The content of the concept of the digital culture of future competitive specialists is revealed. The structure and properties of the digital environment of the higher school, which contribute to the formation of digital culture in students of education, are considered; the functions of the components of the digital environment of the higher school are singled out, their influence on the development of students is shown; the possibilities of the digital environment of the higher school, which is based on practical personal experience, career guidance, advisory, and development activities, have been clarified; extracurricular formats of information and communication technologies were analyzed and summarized during the support of personal and professional development of students. It has been established that the digital environment of a higher school can be the basis for intensifying and improving the process of pedagogical support for the personal and professional development of future competitive specialists.

A retrospective analysis of the historical-pedagogical, legal, and socio-economic prerequisites for the development and formation of IT education was carried out by Yershov (2023): the development trends were characterized and the main stages of formation were identified. The importance of IT training for students of professional (vocational-technical) and specialist higher education in the conditions of digitalization of the modern labor market is shown, and the specifics of their implementation in education and professional formation of a specialist are revealed. A comparative analysis of the directions of IT education was made: informal (seminars, courses, training, master classes), formal (institutionalized), and informal (education at work, in the family, self-education, corporate training).

According to Herhul's (2023) research is devoted to solving the problem of the formation of future philology teachers' infomedia literacy during their professional training; the vision of the algorithm for the formation of infomedia literacy of future philology teachers is presented in the author's interpretation. The content of the concepts "infomedia literacy" and "media literacy" has been clarified; examples of the use of non-formal education are given from this issue; in the process of professional training, the peculiarities of the formation of information media literacy of future teachers are highlighted. The study of Tilikina (2021) is also devoted to the interpretation of the concepts of "Infomedia literacy", "media literacy", "information literacy", "computer literacy", and "digital literacy". A comparison of these terms was carried out, the processes of their formation and development were summarized, and differences and similarities, in correspondence to personality skills were revealed. The most generalizing concept is called the concept of "digital literacy", which reflects the availability of training, and skills necessary for life, and work in a society where access to information and communication is increasingly carried out with the help of digital technologies, such as social networks, Internet platforms, mobile devices.

The problem of application for the formation of the subject-methodical competence of future specialists in information and communication technologies was highlighted by Palamar & Nezhyva (2023). The importance of the use and creation of electronic resources in the educational process, mastery of students' abilities to search in the information space, and formation of professional skills of methodical modeling using digital technologies is shown; to ensure the educational process, the most effective programs for the implementation of educational and methodological tasks have been determined. The student's practical use of intelligence maps, word clouds, comics, online tests, infographics, virtual boards, and interactive tasks as a means of systematizing and visualizing educational material and for pedagogical modeling of lesson plans is shown.

In the context of the digitalization of society, the theoretical foundations of the process of digital transformation of higher education institutions are presented in the research of Sushchenko et al. (2022); the organizational and pedagogical conditions for the formation of digital competence among future teachers were scientifically substantiated and determined. The readiness of students to maximize the use of digital tools was checked; the significance of the introduction of distance educational innovations that increase the efficiency of the educational process based on the new possibilities of digital technologies has been proven; an environment with a strong potential for ensuring the educational activity of an individual – creation of a digital space. The authors claim that "information technologies are aimed at developing the competencies of future teachers, giving them competitive advantages: the dynamism of cognitive activity; motivation (encouragement of students of higher pedagogical education to independently learn new things); the availability of information that simplifies the learning process; interdisciplinary content". Sukhomlyn's (2021) attention is also focused on the formation of students of philology majors' motivation to improve digital literacy throughout their lives and the development of the competencies of future teachers. The problem of internal and external motivation in the process of forming the digital competence of students is considered, importance

of the introduction of distance educational innovations that increase the effectiveness of the educational process based on the new possibilities of digital technologies in the preparation of future philological specialists is proven.

According to Chekhratova's (2022) research is devoted to the creation of a digital educational environment of a higher school, which is developed with the help of various services and programs that are adapted or created specifically for the educational needs of students of higher education and teachers. The use of information and communication technologies in the digital educational environment of a higher school allows you to navigate the information flow, work in a virtual environment, activate students' motivation to study, develop the ability to take responsibility for the learning process, the skills of educational autonomy, determine the tasks and goals of the educational process, master new technologies, choose tools, pace, learning strategies for further professional and educational development.

Analyzing the research of scientists, we conclude that scientists have shown the importance of using and creating electronic resources in the educational process, clarified the meaning of the concepts of "Infomedia literacy", "media literacy", "digital literacy", "digital competence", which are professional qualities for students of higher education, a retrospective analysis of historical-pedagogical, legal, socio-economic prerequisites for the development and formation of IT education was made. The importance of IT training for education seekers in the conditions of digitization of the modern labor market is shown, and the specifics of their implementation in education and the professional formation of specialists are revealed.

The analysis of scientific publications on the issues of digital literacy among students of higher education institutions in a digital modern society confirms the existence of a problem of personnel shortage, which determines the expediency of a fundamental change in the paradigm of their training and retraining to form digital literacy skills in institutions of higher education.

Purpose of the research. Formation of digital literacy skills among students of higher education institutions for personal and professional development of future competitive specialists.

MATERIALS AND METHODS

Research methodology is based on basic modern provisions of pedagogical science, general principles of philosophy, and developments in psychology and reflects methodological approaches and their relationship to the study of the process of professional training of a competitive specialist.

To achieve the goal of the research, the following general scientific methods were used:

- theoretical methods: analysis of the studied special, psychological-pedagogical, scientific-methodological literature on the research problem; analysis of textbooks, monographs, articles of methodological materials of higher education on educational disciplines, pedagogical modeling, and design;
- experimental methods: observation of student learning in a digital modern society and teachers' activities in the process of forming digital literacy skills among students of higher education institutions; interviews and questionnaires; method of expert assessments, methods of pedagogical measurements and diagnostics, methods of statistical processing of research results.

In the process of research, to determine the level of digital literacy of higher school students, we assessed the level of practical mastery of digital technologies of future specialists with the help of a questionnaire.

In the course of research on determining the level of digital literacy of higher school students using a questionnaire, we can state that the majority of respondents have an average level of digital literacy. Such a formed average level of digital literacy of future specialists characterizes a sufficient level of application of digital technologies in professional activities and contributes to its effectiveness.

Statistics show that digital technology is now an important part of functioning for many citizens, both in their professional and private lives.

RESULTS AND DISCUSSION

The essence and importance of digital literacy among students of higher education institutions. The content of the concept of «digital literacy» and the content of concepts that include digital literacy.

The readiness of modern graduates of higher education institutions for the effective formation of digital literacy skills in higher education institutions, the fulfillment of social tasks, and competitiveness in the labor market are confirmed by mobility, personal education, readiness to act in the E-environment, and a person's free command of new information means. Undoubtedly, it is necessary to provide methodological tools and at the same time digital literacy, media literacy, and media culture of future primary school teachers (Chagovets et al., 2020).

In the implementation of methodical tasks by future specialists, they must acquire digital literacy, sustainable motivation of students, their desire for self-education, and self-organization, and the development of the ability to interpret information in Internet networks and differentiate electronic resources. With this approach, the digital

component of the subject-methodical competence of the future specialist contributes to the development and formation of his knowledge about the advantages and opportunities in education and professional activity of digital technologies, educational resources; the ability to create educational and didactic tools in a digital educational environment, to present educational material interestingly, the ability to work with digital devices; digital communication and interaction skills; application of innovative technologies for monitoring learning outcomes (Kuzminskyi et al., 2019).

Skillful use of digital technologies, educational and methodological support, creation of digital content, and development of formative assessment diversifies the possibilities of modeling and conducting classes in higher education (Palamar & Nezhyva, 2023).

Digital literacy includes:

- the ability and willingness of the individual to confidently and effectively use digital technologies in all spheres of life;
- competencies, that is, a set of skills, abilities, and knowledge that are necessary in the modern world for life, for effective use of Internet resources and digital technologies;
- the ability to use information technologies to understand, search, create, evaluate, and transmit digital information (Puhach et al., 2021).

The formation of students' digital literacy takes place in several aspects: students' independent use of phones and computers with Internet access, the study of information technologies for learning and communication in the information space with further improvement of qualifications during professional growth and professional retraining from courses related to application information technologies. All these positions form students of higher education into confident and competent users who can use information technologies in their educational and professional activities and successfully interact in a virtual environment (Sukhomlyn, 2021).

Digital literacy means:

- theory and practice focused on the use of digital technologies, in particular, the ability to communicate, read, and write using digital technologies, take into account cultural, social, educational, and political aspects of innovative activities, the ability to think critically about digital technologies (Tilikina, 2021);
- knowledge and skills of digital consumption necessary for any specialist;
- a basic set of skills and knowledge necessary for working in a digital environment with information: searching and processing information, reading from the screens of digital devices, and communicating using various devices;
- digital competencies of specialists, including readiness to use means of communication, critical evaluation of information, ability to observe information security and create digital resources;
- information culture, which complements the specialist's digital competencies with a worldview aspect and is oriented in the digital environment to the values of interaction, and new ethical principles;
- willingness and ability to effectively solve professional and educational tasks using digital technologies and devices (Shchyrbul et al., 2022).

So, digital literacy is a broad generalized concept that includes three other concepts:

- information literacy (skills for storing, receiving, searching, transferring information, using file sharing and e-mail, educational online resources, making videos and phone calls through the creation of blogs, the Internet, podcasts, etc.), which includes in its content the basic competencies of search, analysis, interpretation, creation, exchange of management and information;
- media literacy (use of resources to check the authenticity of information, online security tools and obtain internet banking and public services online, participation in social networks, etc.) allows you to produce professional communication and critically read mass media;
- technological or computer literacy (software installation; skills in using digital devices (cameras, smartphones, cameras, etc.) includes a general set of skills and knowledge of the safe use and content of the work of digital devices, applications, tools, tools, services, regardless of the interface or platform (Biletska et al., 2021).

Each of these concepts, which represent the composition of the concept of «digital literacy», includes such a set of components (knowledge and skills that are necessary for a person throughout his life), which reflects the completeness of the interpretation of these concepts (Tilikina, 2021).

The concept of «cyber security» is used along with the concept of «computer literacy» – this is a very broad term, which is based on three concepts that are fundamental and which received the name «CIA»: accessibility, confidentiality, integrity:

- ***accessibility*** – the ability to use the resource by the rules established by the security policy.
- ***confidentiality*** – a property that is not subject to publicity, privacy, or secrecy.

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- *integrity* – a property that means that the data cannot be destroyed or changed without an access sanction and that is related to the data set (Semekhina et al., 2020).

Such a model in the field of information security is used by the management of the organization (InfoSec) (Zakharevych & Hryhorenko, 2024).

Core competency blocks are required for the updated Digital Competence framework (DigComp 2.0).

Digital competence or digital literacy is recognized by the EU as one of the 8 key human competencies for a full life and activity. The updated Digital Competence framework (DigComp 2.0) consists of the main 5 competence blocks, in particular:

1. **Information and data literacy**, which makes it possible to work with data:

1.1. searching, filtering of digital content and information, data (Browsing, searching and filtering data, information and digital content);

1.2. the ability to evaluate digital content, information, and data (Evaluating data, information, and digital content);

1.3. the ability to manage data, use information, and manage digital content (Managing data, information, and digital content).

2. **Collaboration and communication**:

2.1. thanks to the use of digital technologies – the ability to use private and public services, contact with society (Engaging in citizenship through digital technologies);

2.2. through the use of digital technologies – the ability to communicate (Interacting through digital technologies);

2.3. thanks to the use of digital technologies – the ability to share information (Sharing through digital technologies);

2.4. thanks to the use of digital technologies – the ability to interact (Collaborating through digital technologies);

2.5. ability to manage digital identity, and accounts (Managing digital identity);

2.6. knowledge of «netiquette» (Netiquette).

3. **Digital content creation**:

3.1. To create new content, the ability to improve, change, and use digital content (Integrating and re-elaborating digital content);

3.2. creating digital content (Developing digital content);

3.3. the ability to write program code, i.e. programming (Programming);

3.4. awareness of licensing and copyright policies regarding information, data, and digital content (Copyright and licenses).

4. **Safety**:

4.1. protection and privacy of personal data (Protecting privacy and personal data);

4.2. the ability to protect the knowledge of security measures, devices, and content, understanding of risks and threats (Protecting devices);

4.3. environmental protection (impact of digital technologies on the environment, and ecology) (Protecting the environment);

4.4. protecting health and well-being (skills and knowledge to preserve the health of others and one's health from the point of view of threats to the safety of citizens, the ecology of the use of digital technologies, risks) (Protecting health and well-being).

5. **Problem solving**:

5.1. the ability to find appropriate technical solutions, identify needs, and customize digital technologies to one's own needs (Identifying needs and technological responses);

5.2. ability to solve technical problems (Solving technical problems);

5.3. in obtaining additional new digital skills, the ability to independently determine the need (Identifying digital competence gaps);

5.4. creative use, or the ability, thanks to digital technologies, to create collectively or individual products and processes, to gain knowledge to solve professional and everyday life problems (Creatively using digital technologies) (Vuorikari et al., 2016).

The main issues of preparing young people for digital citizenship in the conditions of a modern educational environment of a higher school.

Institutions of higher education need to introduce new educational platforms, tools, and standards for evaluating student achievements. In the innovative conditions of today's education, the primary task of higher education is related to the development of innovative approaches to professional activity, the formation of digital educational leadership, and the student's research position in the development of an informational and innovative digital environment.

Thanks to such an innovative position in the educational environment, professional training at universities is confirmed by research by the independent Swedish fund Riksbankens Jubileumsfond and statistical data by

experts of the Ericsson Consumer Lab division: in 2020, higher education seekers who receive online education – 3.5 million – 50% of all students in the world (study «School of the Future»).

The Association of European Universities (EUA) presented the experience of 249 universities from 37 countries of the world. ***Regarding the data of her report, we assert:***

- more than 80% of universities have world-class repositories for storing digital content and electronic courses and various systems for managing and creating educational resources for students;
- 82% of universities offer online courses;
- 91% of universities use blended learning (Herhul, 2023).
- With the help of gadgets, mobile devices, etc., young people almost always and everywhere have uncontrolled access from adults, and not only increase the amount of time they spend on the Internet (Shetelya et al., 2023).

Let's name the most important means that determine the observed trends:

- systems of open education;
- scientific and educational information networks;
- cloud computing;
- global networks of innovative educators;
- mobile devices;
- distance and electronic learning technologies;
- technologies supporting augmented and virtual reality, etc.

This does not automatically lead to the formation of the necessary digital competence of a person, because of the existing flexibility and contextual sensitivity on the part of various services, although it provides the possibility of a quick search by previous requests and personal settings, but at the same time slows down the development of students' own skills. This determines the expediency of systemic measures to develop appropriate services and resources capable of motivating young people to master advanced intellectual resources, digital devices, responsible support, and encouragement to competently use non-threatening digital technologies with a certain range of settings.

Therefore, let's name the main issues of preparing young people for digital citizenship in the conditions of the modern educational environment of the university:

- digital literacy: the process of developing technologies and learning (to be able to properly and quickly use innovative approaches in education and professional activities);
- digital access: fully electronic participation in the activities of the society (understand that equal electronic access implies the absence of advantages in the electronic society about racial, physical, or mental differences, in particular, the increase in the number of people in large and small cities);
- digital legislation: electronic responsibility for deeds and actions (mastery of rules related to illegal actions);
- digital communication: electronic exchange of information (skillful use of possible access to information everywhere and always);
- digital security (self-protection): preventive electronic measures to overcome danger (to be able to protect information from external forces, prevent its destruction or damage, i.e. from data backup, viruses, strengthening of control equipment, etc.);
- digital responsibilities and rights: freedoms apply to everyone in the digital world (necessary analysis, understanding, and discussion of digital basic responsibilities and rights for everyone, with the aim of effective education and professional training in the digital society, ensuring a critical approach to assessing the reliability of information);
- digital etiquette: electronic procedures or standards of behavior (to be digitally responsible citizens in the new society);
- digital commerce: electronic sale and purchase of goods (in the conditions of a safe digital economy – to be efficient consumers).

Special attention when preparing young people for digital citizenship in the conditions of the modern educational environment of the university is given to open educational resources, which must meet the modern challenges of establishing a balance between socialization and personal development of scientific and pedagogical personnel, education for obtaining qualifications. In the specified conditions of the higher education institution, several measures are implemented:

- research of resources that are very attractive in non-formal education;
- developing resources for monitoring successes and problems, implementing digital technologies, planning and considering the search for creative solutions to organize a favorable network of productive cooperation;
- to develop a conscious transition to interactive content from passive content in education – development, and planning of projects;
- the use of media educational resources (in particular, based on open access to library resources, museums,

and media channels) contributes to the high-quality preparation of students for active social life.

Therefore, experience shows the need to involve students in mastering relevant skills, active use of digital technologies, and, as a result, the formation of students' digital literacy skills (Oliynyk et al., 2017).

Effective online media literacy courses for independent study of material in the process of forming students' digital literacy skills and the main components and elements of digital literacy.

We offer future specialists in the process of forming students' digital literacy skills several online media literacy courses for self-study. EdEra and PROMETHEUS educational platforms offer courses aimed at the ability to resist information pressure, work with information, form critical thinking, and distinguish false information. Completion of these courses allows higher education students to receive points for non-formal education.

The following courses can be offered: «Media Literacy for educators» (https://bit.ly/2DqQgtX), English for Media Literacy (https://bit.ly/3LE9Owv), «Media Literacy: how not to be manipulated?» (https://bit.ly/41f2jBX), «Very Verified: online course on media literacy» (https://verified.ed-era.com/ua) (Herhul, 2023).

Upon completing their studies at the university, students must have the level of digital culture necessary for a modern specialist, which is helped by online courses on media literacy, which are offered for independent study of the material in the process of forming students' digital literacy skills. Depending on the field of future professional activity, their digital competencies may differ (economy, education, ICT, life protection). However, a person's digital literacy, which allows for successful educational activities, and later professional activities, must be formed by the student while studying (Hurevych et al., 2024)

Let's define the main components of a student's digital literacy: critical thinking, rational consumption of information, selection of reliable and reliable sources of information, interpretation or giving priority to facts over opinions, research to prove the truth of conclusions, view, assessment from various aspects of an information message; ability to use software, modern information technologies in professional activities; participation in solving environmental problems caused by information progress «Greening IT», – «green» use of information technologies; IT volunteering – using ICT to improve the world around us (Scott, 2015).

Creation of a digital educational environment for the formation of digital literacy skills of students in institutions of higher education.

A student's digital literacy includes abilities and skills that can be grouped into seven elements in education:

1. information literacy – the ability to interpret, evaluate, find, exchange and manage information;
2. media literacy – the ability to creatively use professional and academic communications, to critically perceive various mass media;
3. cooperation and communications – the ability to use digital networks for research and training;
4. ICT literacy – the ability to adapt, accept, and use applications, services, and digital devices;
5. digital scholarships – participation in professional, new academic, research practices based on digital systems;
6. management style and career – the ability to manage online identity and digital reputation;
7. learning skills – the ability to effectively learn and teach in informal and formal high-tech environments with the aim of mastering general professional, cultural, and professional competencies during the professional training of education seekers (Zinchyna, 2023).

The main goal of higher education institutions is to prepare a student for innovative professional activities and to form a sufficient level of digital literacy in the student – that is, to form a cognitive, informational, and technological level of digital culture and to prepare him for the productive use of digital information technologies.

At these levels of digital culture, work skills include:

- development and digital learning;
- work with information and digital devices, including multimedia resources;
- communication cooperation using applications for work in social networks, mail clients, digital innovations (digital tools, online identity, etc.) (Hurevych et al., 2024)

Let us name the characteristic features of the digital educational environment of a higher school, which is necessary for the formation of a student's digital literacy:

- system combination of material and technical support (local network, literature, organization of access to services and resources of the global network, computers, etc.);
- information support (access to information on various media, to knowledge about methods of storage and search, about the system of their organization, etc.).
- communication support (communication without means of communication and with the help of means of communication).

Such resources, skills, knowledge, and communications that are formed in the digital educational environment of a higher school are necessary for the formation of a student's digital culture. The digital educational environment of the higher school makes it possible to increase the efficiency of the internal units of the university and the efficiency and quality of the provision of educational services (resource planning systems, decision-making, electronic document management, etc.) based on the use of digital technologies and due to informational and methodological support, interdisciplinary connections of participants educational process.

The digital part of the educational environment of the higher school, as a pedagogical system, allows the student to fully master educational programs through the Internet, using the system of access to educational resources. The digital educational environment of a higher school is a multi-level system and includes the personal and general educational components of the teacher and student. Digital, legal, methodological, and educational resources of the educational system determine the direction of education development in any institution of higher education (Kuchai et al., 2022).

The level of the digital educational environment of the higher school ensures the implementation of educational goals in this institution, taking into account the territorial specificity.

The digital educational environment of the higher school provides:

- access to work programs of disciplines, curricula, and digital educational resources offered by work programs;
- implementation of educational technologies;
- recording the results and course of the educational process;
- formation of an electronic portfolio;
- preserving the works of those who have obtained higher education;
- interaction between the participants of the educational process (Stratan-Artyshkova et al., 2022).

With the help of unified databases, the necessary information is integrated, including ICT, and virtual libraries that provide interaction between users and information flows. A pedagogical system of the educational environment of a higher school is being created, which allows the student of higher education to receive an education regardless of where he is located. The digital educational environment of each institution of higher education depends on the provision of the necessary equipment, and the development of technical infrastructure, which is unique and relies on the possibility of open access to the resources of the digital educational environment of the higher school to form the digital competencies of the participants of the educational process. The peculiarities of the digital educational environment of the higher school include a wide range of specialties, their uniqueness, focus on the integration of learning, development of business, science, and production (Plakhotnik et al., 2023).

Within the framework of the digital educational environment of the higher school, a personal digital educational environment for teachers and students is formed, which allows them to implement professional and educational activities, improve the skills of research and information activities, and develop the personal digital culture of the student. The composition of digital educational resources determines the saturation and completeness of the digital educational environment of a higher school. Some of the resources (textbooks, work programs of disciplines, etc.) have a regulated structure and content. To form a student's digital culture, the skills of working with them are insufficient. The other part is various literary sources, reference and legal information resources, open Internet resources, resources of information and library systems, etc. (Polishchuk et al., 2022).

From the pedagogical point of view, it is necessary to include in the content of the digital educational environment of higher school electronic libraries, distance learning systems, and interactive educational resources that form an educational digital space. The work of methods of organization, digital educational resources of various structures, as well as the possibility of communication in social Internet services, as well as within the digital educational environment of a higher school, allows you to master digital competencies: critical evaluation and search for information, interactions in the digital educational environment of a higher school based on ethical principles, compliance with information security, etc. Therefore, the digital educational environment of higher schools contributes to the development of the digital culture of university students (Shuliak et al., 2022).

Regardless of the time of day and location, the digital library provides teacher or student access to scientific literature from any device. Many higher education institutions today combine digital and traditional libraries in terms of end-user experience (Kravchenko et al., 2022).

The digital educational environment of the higher school contributes to the information security of the student's personality by providing digital educational resources containing non-aggressive, ethical information that meets ergonomic and pedagogical requirements, ensuring the protection of student and teacher copyrights (checking for borrowing in Anti-plagiarism systems), including

training modules digital culture of the user in the content of training and ensuring the information security of the individual. Therefore, the digital educational environment of a higher school can provide opportunities for students to develop their digital culture and is not only a necessary condition for their successful development (Plakhotnik et al., 2022).

Let us name the possibilities of the digital educational environment of the higher school, which enhances the course of formation of digital literacy among students, because:

- ensures the organization of the educational process and the content of education with a wide range of digital educational environments of the higher school;
- promotes the implementation of various local and open innovative structures and methods of their organization in education;
- ensures informational and pedagogical interaction of the subjects of the educational process and practice-oriented, educational, independent, research and information activities;
- allows the use of interactive, active, distance, and mixed forms of education;
- ensures the student's personal information security;
- saturated with valuable aspects for personal development (Kuchai et al., 2017).

Experiment.

Digital literacy of society is a key prerequisite for increasing the accountability of state authorities, using the tools of electronic democracy, intensifying the participation of citizens in the life of the state, and preventing corruption. Therefore, increasing the level of digital literacy and digital skills among all people on the planet is an important element of the development of modern society.

To study the phenomenon of the digital divide of the population in the world, a study was conducted, which was a complex result of the joint work of many partners – the Eastern Europe Foundation, UNDP, the educational platform EdEra, and others.

The study gave an idea of the level of digital literacy of the population: – 54% of respondents, according to the methodology of the European Commission, have digital skills at the «below average» level. Respondents aged 16 to 70 were taken into account:

- 15% lack such skills;
- communication and information skills (of all digital skills) are the most developed among the population – more than 70%;
- the skills of working with software and solving the problems of digital literacy of the population need the most attention.

The study shows that there are age differences in digital skills: 67% of respondents aged 10 to 17 (according to the methodology of the European Commission) have skills at the «above basic» level. But precisely such a progressive age category makes up only 26% of the entire population.

Therefore, the results make it possible to state that older respondents lag significantly in digital skills.

To eliminate the digital divide of the population, it is necessary to fully provide 100% high-speed Internet access to population centers and transport infrastructure, digitize public services, and involve millions of citizens in digital skills development programs.

To increase the level of digital literacy of the population, publicly available courses have been launched, which aim to give people more development opportunities and overcome the digital divide.

The results of the survey showed that:

- about 50% of higher education students believe that their parents, and grandparents should increase their level of digital literacy, improve their digital skills,
- about 30% of representatives of the older generation believe that increasing the level of their digital literacy is important.
- about 55% of higher education graduates enthusiastically help people of the older generation,
- about 30% of respondents would be happy to transfer this responsibility to others.

This indicates the importance and necessity of creating a digital literacy course to improve the digital skills of the global population, because the role of higher education students in this process is not decisive, although important.

In the process of research, to determine the level of digital literacy of higher school students, we assessed the level of practical mastery of digital technologies of future specialists with the help of a questionnaire. The following results were obtained:

- 97% of respondents actively use the Internet;
- 83% of respondents do not experience difficulties in working with digital devices;
- 72% of respondents are interested in new programs, applications, and resources;
- 88% actively follow professional social networks;

So, in the course of research on determining the level of digital literacy of higher school students using a

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questionnaire, we can state that the majority of respondents have an average level of digital literacy. Such a formed average level of digital literacy of future specialists characterizes a sufficient level of application of digital technologies in professional activities and contributes to its effectiveness.

Statistics show that digital technology is now an important part of functioning for many citizens, both in their professional and private lives.

Nowadays, all structures act as consumers of digital technologies: businesses, states, and citizens. Digital technologies are increasingly present in various spheres of life, so all social groups must be ready for their effective use.

According to the purpose of using Internet services, the students of the higher school were divided as follows:

- use Internet services: receiving, sending e-mail – 99%;
- independent study and education – 85%;
- reading, and downloading material online – 97%;
- software download – 23%;
- downloading movies, music, images – 94%;
- video or computer games or their downloading – 51%;
- watching television or video, etc. – 100%;
- telephone conversations via the Internet/Volp (iTalk, Skype, via web camera) – 49%;
- communication – 100%;
- searching for information related to health issues – 30%;
- Search for information related to issues of professional career growth – 93%;
- banking services – 100%;
- order (purchase) of goods – 59%.

The active attraction of investments from developed countries of the world contributes to the expansion of the online education market. To develop technological solutions for education, the total investment in Edtech reaches billions of dollars per year. The USA accounts for the highest share of investments – 42.9%. China and Japan also contribute a lot, because investors consider it a priority investment in learning tools based on artificial intelligence, mobile learning, in e-learning to increase the level of digital literacy of future specialists, which will make them competitive in the labor market.

CONCLUSIONS

The essence and importance of digital literacy among students of higher education institutions are revealed. the main elements of the content of the concept of "digital literacy" and concepts that include digital literacy are shown. The main aspects in which students' digital literacy is formed are shown. The basic blocks of competencies required for the updated Digital Competence framework (DigComp 2.0) are described. The main issues of preparing young people for digital citizenship in the conditions of a modern educational environment of a higher school are grouped.

The most effective online media literacy courses for independent study of the material in the process of forming students' digital literacy skills are named, and the main components and elements of a student's digital literacy are highlighted. The ways and characteristic features of creation are shown, and the necessity and possibilities of a digital educational environment for the formation of digital literacy skills of students in higher education institutions are shown.

In the process of research, to determine the level of digital literacy of higher school students, we assessed the level of practical mastery of digital technologies of future specialists with the help of a questionnaire. It was established that the majority of respondents have an average level of digital literacy. Such a formed average level of digital literacy of future specialists characterizes a sufficient level of application of digital technologies in professional activities and contributes to its effectiveness. Statistics show that digital technology is now an important part of functioning for many citizens, both in their professional and private lives.

The obtained research results encourage further consideration of the given problem and provide prospects for further research, namely the establishment of practical advantages of the digital environment of higher education, which is the basis for intensification and improvement of the process of pedagogical support for the personal and professional development of future competitive specialists.

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