



DEVELOPING INFORMATION CULTURE IN STUDENTS DURING E-LEARNING

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Abstract: *This article examines the peculiarities of the formation of information culture of students in the context of electronic learning in higher educational institutions. It is noted that the development and formation of the information society determines new requirements for the individual in both social and professional spheres of activity. The formation of information culture is a priority task for institutions of higher education, as the educational system must respond to modern challenges and quickly adapt to effective functioning in the information society. Digitization, distance education, e-learning, introduction of new information technologies, interactive forms of communication and interaction – all this makes it possible to transfer the educational process to a qualitatively new level and form the information culture of the individual. The study reveals the meaning of the concept of «information culture»; ways and methods of its influence on the effectiveness of the educational process are determined. Information culture is considered as an integration of socio-cultural and technological aspects. This means that the information culture of the future specialist is formed under the influence of the socio-cultural environment of the higher educational institution, with the mandatory use of electronic learning to acquire the competencies necessary for the full self-realization of the individual in the information society. The main components of the information culture of the future specialist are defined, including: information literacy, information-digital competency, information reflection and self-improvement (self-educational competency). It is noted that the rapid increase in the use of information and digital technologies in education, e-learning, in particular the introduction of distance learning, is associated with the COVID-19 pandemic, as well as with the full-scale war in Ukraine.*

The results of sociological research show that, despite certain problems, emergency distance learning allowed university students to adapt quickly enough to new realities, acquire digital skills and increase the level of information culture. It is noted that the experience gained from introducing distance learning will continue to be applied. However, combining traditional and electronic training is considered to be the most effective approach to forming an individual's information culture.

Keywords: information society, information culture, information competency, information literacy, information reflection, e-learning, information technologies, educational process, higher education, students, teachers

INTRODUCTION

In modern society we observe a changing nature of work as well as the growing role of information and knowledge at all levels and in every sphere of social life. This results from the entry of humanity into a new era of its development – the period of building an information society which has aroused great interest in the aspects of informatization, new information technologies, aspects of the influence of informatization on the development of personality in a qualitatively new environment. In this context, a person constantly experiences not only the need for information, but also a lack of certain skills and abilities that must be used in everyday activities. This is particularly urgent in the professional sphere, where the demands on specialists are constantly increasing, including the formation of independent thinking and learning, the ability to monitor changes in various spheres of society and the ability to respond to them critically, the ability to make decisions in complex non-standard situations, which requires deep contextual awareness and ICT experience.

The increased focus on developing an individual's information culture and the intensified use of technologies and e-learning practices are driven by several reasons:

- constantly growing information needs of modern society;
- a revolutionary increase in Internet coverage over the last decade and a increasingly easier access to it;
- dynamic progress in information and digital technologies, distribution of software products to ensure electronic and distance learning, its organization and management;
- active use of information technologies in almost all areas of human activity;
- dynamic broadening of potential opportunities of information technologies in terms of their impact on the individual and society as a whole.

Therefore, the priority task of modern education system is to develop students' information culture for full-fledged activity in key areas of life. In modern conditions, education is the most powerful source of information culture, because in the modern educational process, both traditional and innovative means, methods, and learning technologies are used which contribute to the formation and development of a new type of personality, capable of acting in the context of information society. Digitalization, distance learning, e-learning, introduction of new information technologies, interactive forms of communication, enables the educational process to transition to

a higher quality level, which allows professors to grow the information culture of the individual.

1. PREVIOUS RESEARCH

Previous research into the development of the individual's information culture presents this problem as relevant and quite a few of its aspects are studied closely by modern scientists.

The current research on the individual's information culture is grounded in theories of the information society put forth by D. Bell, M. Castells, M. McLuhan, E. Toffler, A. Turenne. These theories emphasize the critical role of knowledge and information in the modern society.

Numerous scholars study the conceptual foundations of information culture, as well as the problems of its formation in the modern information society (Ukhanova, 2021), (Kovalchuk & Mikhailina, 2023), (Palekha et al., 2020).

Researchers stress that developing information culture of future specialists in educational institutions is a necessary condition for the full inclusion of an individual in the modern information society and future professional activity (Charkina, 2021), (Trubnyk et al., 2019). Studies devoted to the information culture of future teachers (lecturers) hold particular significance (Babenko, 2012), (Hurevych & Atamaniuk, 2023), (Klymenko, 2010).

Importantly, the integration of e-learning into the system of higher education was one of the most effective means of fostering individual information culture. Scholars look into various aspects of the establishment and development of e-learning, the emergence of new information and communication technologies and their integration into the educational process, the transformation of the educational institution in the context of establishment and development of the information society globally and in Ukraine (Kravchenko, 2016), (Areshonkov, 2020), (Kucherak, 2020).

The authors of the present study have a number of publications devoted to certain aspects of the implementation and active use of innovative technologies, e-learning in institutions of higher education, in particular, on network communication and its positive impact on the efficiency of the learning process (Shelomovska et al., 2017), on the use of mass media in education (Shelomovska et al., 2019), on cloud instruments in training students of socio-humanitarian specialties (Shelomovska et al., 2020).

However, the papers mentioned above primarily focus on specific aspects of introducing modern technologies into the educational process and often neglect their influence on the development of an individual's information culture, which is a current necessity.

Therefore, **the purpose of this paper** is to study aspects of developing information culture in university students in the context of e-learning, as well as to pinpoint the general trends in the implementation and use of distance and e-learning during the pandemic and wartime in Ukraine and its impact on the level of information culture of students.

The paper aims to address the following **research questions**:

- What is the structure of the concept information culture?

- How does e-learning and distance affect the process of developing information culture in students?
- What kind of general trends in the implementation of e-learning and distance learning are pinpointed by the sociological research on the state level of Ukraine?

2. PRESENTATION OF RESEARCH RESULTS

2.1. The concept of information culture

Information culture is a highly relevant concept today. However, it still does not have any unambiguous interpretation in the scientific literature. Definitions of information culture often reflect the specifics of research and the field of knowledge. So, let's consider the definition of information culture by various scientists.

Information culture is often considered a part of both individual and societal culture. It varies according to the intensity of information interaction and all information relations. This concept makes it possible to forecast the direction and speed of change in terms of handling information for the purpose of its further elaboration based on the acquired knowledge (Palekha et al., 2020).

Information culture reflects the level of development of information relations in society, as well as people's activity in the information environment. Information culture is designed to give individuals information freedom which equals guaranteed access to all the necessary information, as well as to provide opportunities for information communication and for the development of people as individuals (Kovalchuk & Mikhailina, 2023).

Information culture of an individual is based on knowledge about the information environment, the laws of its functioning and development, the ability to navigate in the boundless universe of endless messages and data, to rationally use the means of modern ICTs to meet information needs (Blystiv & Halaz, 2015).

Some researchers add a legal aspect to the interpretation of information culture. Thus, information culture is interpreted as reflecting a combination of material and intellectual human values that enable the effective application of various methods of processing information, including being a participant of informational legal relations. This definition focuses on the legal regulation behind modern technologies, in particular, the use of artificial intelligence as a phenomenon that has positive prospects, but carries great risks (Ukhanova, 2021).

Therefore, when researching information culture, it is necessary to acknowledge that on the one hand, it contributes to the acceleration of technical progress, affects the development of both the individual and the society as a whole, and on the other hand, it has a significant negative impact. Thus, modern information environment presents numerous threats: destruction and distortion of information, disclosure of confidential information, hacking, illegal interference in the activity of computer systems, disabling them, etc. (Charkina, 2021). Thus, the manifestation of an individual's information culture in the process of using information technologies should be based on the principles of respect for human dignity, humanism, strict observance of human

rights and freedoms, critical perception of information, as well as responsibility for the consequences of one's information activities.

In the broader European and global academic context surrounding information culture, a relatively lower level of research interest in the topic can be observed. This may be due to the broad nature of the concept, which serves as more of a conceptual framework, thus leading studies to concentrate on a specific component of the information culture structure.

Nevertheless, two wide information culture approaches are evident through the literature. Information culture is defined as an environment where information is well-managed and efficiently utilized. One defines information culture as an environment where information tends to be managed well and used efficiently (Oliver, 2017). This approach is commonly implemented in corporate settings and forms a part of the organizational culture. It encompasses the typical information and communication practices in an institution, as well as the accepted attitudes towards information as a resource and specific collaborative efforts to process information. It is argued that each company possesses a distinct information culture that sees information as a valuable resource for accomplishing corporate objectives (Hansen, Widén 2017). Within this knowledge management approach, information culture is regarded as a time-varying feature of the collective information behaviors arising from information and knowledge management processes within an institution. This develops due to the continuous evolution of information needs, along with the conscious or unconscious development of employees' knowledge (Deja, 2023).

The alternative viewpoint posits that the notion of information culture is a multifaceted, all-encompassing concept which reflects cultural values, attitudes and behaviors associated with learning and information. This encompasses an individual's awareness of their own information requirements, as well as their ability to effectively and ethically identify, obtain, evaluate, organize and apply information to address concrete issues and problems. It is a mental framework and an essential component of lifelong learning as a human right in the information age (Elamrousy, 2022). Information culture, with broad implications, is believed to be vital to the transformation of the European educational system (Virkus et al., 2020).

Overall, the analysis of scientific works devoted to the study of the information culture of the individual made it possible to determine that, most often, the information culture is considered as: 1) a component of the general and professional culture of the individual; 2) a set of certain human qualities that allow working with information; 3) a certain level of experience with information and communication technologies; 4) information processing methods; 6) expertise of a specialist in modern society; 5) the ability to work with information and use information technologies to work with it; 7) the ability to analyze and critically interpret information.

When defining the concept «information culture» in our research we are relying on an integrative approach which includes both broad (general humanitarian, sociocultural) and narrow (informational and technological) aspects. Thus, the first aspect includes such components of general culture as value attitudes, motivation, informational needs of the individual which encourage people to search for, process and use the necessary information. In this aspect, the key role is played by the principle of

humanization which indicates that any information should serve the development and improvement of the individual and society in general. Regarding the second aspect, a certain level of mastery of information technologies for full functioning in modern society comes to the fore. It should be emphasized here that the latest technologies, electronic means of learning, digital resources in general are considered the foundation for the information culture of the individual, for their creative potential, for the development of competencies necessary for the full self-realization of the individual in the information society.

Analyzing scientific literature identified the main components of the individual's information culture model. These include:

- *information literacy*, that is, mastering the system of signs and their meanings, work instruments, in particular means of information cognition, as well as their application in professional activity, the ability to navigate information flows, etc. Information literacy is needed for critical perception, evaluation and use of information and media in personal life and professional activity. Simply put, information literacy is our ability to consume and interpret the information that comes our way;
- *information and digital competency* is realized through mastering a computer, e-mail, and Internet technologies; work with library catalogs; experience and willingness to work with information flow in oral and written, printed and electronic forms; awareness of the virtual world meaningfulness; willingness to use various sources of information and information technologies for professional purposes and in the process of self-improvement, as well as willingness and ability to reasonably limit the use of information technologies. Computer literacy forms the foundation of information literacy and information-digital competency. Computer literacy is the knowledge, skills and abilities in the field of informatics that every person needs in order to adequately use the potential of ICTs in their activities;
- *informational reflection* is needed by individuals to track the goals, process and results of their efforts to develop information culture, as well as to be aware of those internal changes that occur in the individuals themselves. The following components are covered by reflection of a person as a subject of information culture: being aware of one's own level of information literacy and competency, features of the value-meaning sphere, adequate understanding of one's competencies in the field of information technologies, etc. Information reflection can only be demonstrated when one has developed information literacy as well as information and digital competency;
- *informational self-improvement* (self-educational competency) is at the top level among the structural components of an individual's informational culture. The transition to a new information society poses a difficult challenge for each individual: not only mastering existing types and methods of activity, but also their constant improvement, development of professional skills, abilities and qualities. It should be emphasized that the ability to independently acquire, structure, and transfer information is a crucial professional competency in any field. Noteworthy, it is informational reflection that precedes informational

self-improvement that gives impetus to the desired trajectory of improvement and updating of knowledge. The structural model of information culture is presented in Figure 1. This model arranges all components in order of importance while also showing how they complement each other.

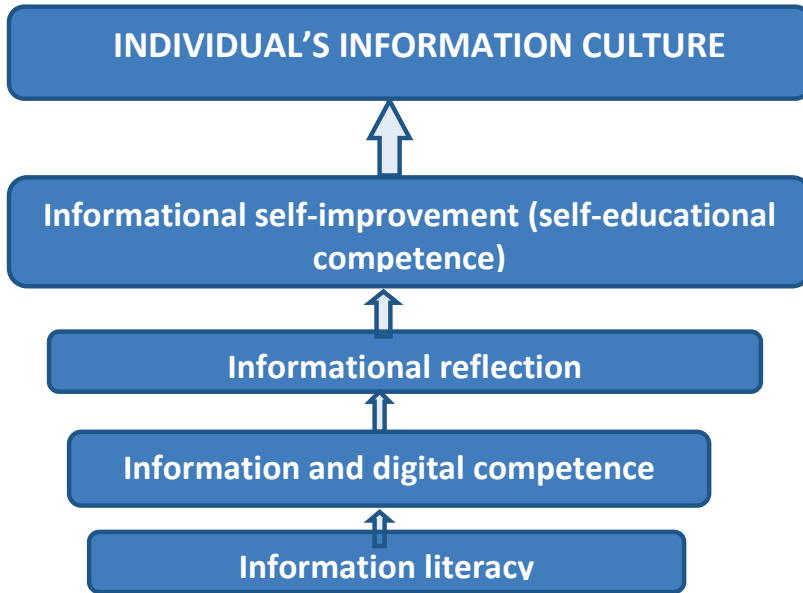


Figure 1. Structural Model of the Individual's Information Culture

Source: Own work.

Rapid informatization is promoting a shift in the educational paradigm: from imparting a certain amount of knowledge to students, to their independent acquisition of the necessary information, interpreting it and using it in professional activities throughout their lives. The self-education activity of a modern day specialist should include at least several components: self-education in the field of professional activity, information technologies, as well as self-improvement in the field of fundamental knowledge.

It has been demonstrated that modern information technologies allow future specialists to gain access to a significant amount of state-of-the-art information, facilitate its search, and also provide tools for information processing. The skills and abilities of professional self-education should be formed during the period of professional training. In the era of booming information society, information technologies are becoming an important means of self-education. The use by future professionals of job related Internet sites, simulation games, participation in network professional communities, webinars, use of social network services, programs for instant messaging, training on Internet courses, etc. will contribute not only to the motivation for self-education, but also enables future specialists to acquire the necessary professional information productively and in the optimal time frame as well as form professional skills and abilities (Nevmerzhytska & Pahuta, 2018).

2.2. Developing information culture in students

The most active and, in our opinion, effective period in the formation of the individual's information culture is university study period. It is there that the person is immersed in a socio-cultural environment, where the main task is to obtain information and competencies to meet their needs both in personal life and in future professional activities.

Noteworthy, the sphere of higher education has significantly changed over the past several decades due to the introduction of new information technologies, interactive forms of communication which allow one to bring quality change to the process of reproduction of knowledge, both in terms of educational management and acquisition as well as perception of information.

E-learning is a study mode that allows participants to use in the educational process Internet technologies, electronic teaching and methodical as well as multimedia materials, electronic libraries, virtual laboratories and workshops, etc. It can be argued that e-learning appeared with the use of computers and the Internet in education. Today, according to a 2022 study, approximately 82% of Ukrainians use the Internet at least once a week, with 78% of them using the Internet daily (Korystuvannia Internetom sered..., 2022).

In the field of education, the percentage of respondents who use Internet technologies is much higher, because, understandably, new challenges in society are reflected in the transformation of the educational system, which is manifested in the active use of information technologies.

It should be noted that the introduction of e-learning into the educational process occurs at two levels – spontaneous (initiative) and institutional. At the spontaneous level, the implementation of e-learning elements is carried out unsystematically, mostly on the initiative of teachers and students, and is mostly fragmentary. For example, students' remote interaction with teachers takes place via e-mail, social networks, mobile applications, amateur use of remote interaction technologies for certain disciplines, etc. Simultaneously, a conscious, systematic, regulated and controlled use of information and communication technologies is ensured only at the institutional level which. This includes e-mail, social networks, mobile applications for distance education, as well as platforms and systems of e-learning and the organization of their control, information and cloud environments, automated learning process management systems, etc. which are presented on the websites of higher educational institutions or their divisions.

The significant increase and intensification of e-learning, the use of information technologies in education, in particular the introduction of distance learning, is linked to both the COVID-19 pandemic and the full-scale war in Ukraine.

In general, researchers dealing with the implementation of innovative technologies in the educational process, in particular distance learning, stress that this form of education has many advantages. The fundamental difference between distance learning and traditional form is that it is based on the student's independent activity. This type of activity is designed to teach young people to independently study the outlined sources, perform practical and individual tasks, clearly formulate their thoughts and

take responsibility for learning. Distance education students have the opportunity to study at a convenient time, in a convenient place; to combine study and work, to independently choose the pace and speed of study, which is how individualized learning manifests itself. Also, among the advantages of distance learning, one can note the possibility of round-the-clock access to educational materials, constant support and consultation of teachers, video lectures in online mode. The indisputable advantage of distance learning is the mastering of new information technologies by both students and teachers.

If, under traditional forms of education, the main task of the student was to memorize the material and then reproduce it, with the use of remote technologies students develop the skills of comparison, synthesis, analysis, evaluation, discovery of connections, planning, group interaction using ICTs and distance learning technologies. So, despite the fact that the pandemic significantly disrupted the traditional educational process in higher education institutions, it opened up opportunities for accelerated transformation of modern education in the field of information technology application. These developments also contributed to the faster adaptation of universities in the conditions of martial law in Ukraine. There are several official analytical documents that summarize the problematic issues of the quality of educational services during the quarantine period and in the conditions of martial law in Ukraine. Thus, in the period from May 6 to 13, 2022, the State Service for the Quality of Education of Ukraine conducted an anonymous online survey of applicants and scientific and pedagogical workers of higher education institutions of all types and forms of ownership. In the study, they authors focused on the management of the educational process and the quality of distance learning in the 2021/2022 academic year, problematic issues of the quality of educational services during the period of martial law were identified, and the dynamics of processes related to the use of distance learning technologies in war conditions were studied, compared to the previous period of distance learning. About 27,000 respondents from 54 institutions of higher education took part in the survey: 20,907 students of higher education and 5,997 scientific and pedagogical workers (Analitichna dovidka schodo..., 2022). The results of the study indicate that during martial law period, almost all institutions of higher education (99.8%) switched to distance learning without any obstacles.

Simultaneously, due to unresolved problems of a material and technical nature, domestic universities cannot consider the development of distance technologies in the organization of the educational process as a separate strategy, unlike universities in European countries. According to teachers, only a third of Ukrainian universities have the opportunity (material and human resources) to decide centrally on the use of information technologies in the organization of the educational process (33.4%), while others (63.7%) in most cases transfer the responsibility to faculties, departments or the teachers themselves. Almost 3% of the surveyed scientific and pedagogical workers are not aware whether their university supports the development of distance learning technologies during martial law (Fig. 2)

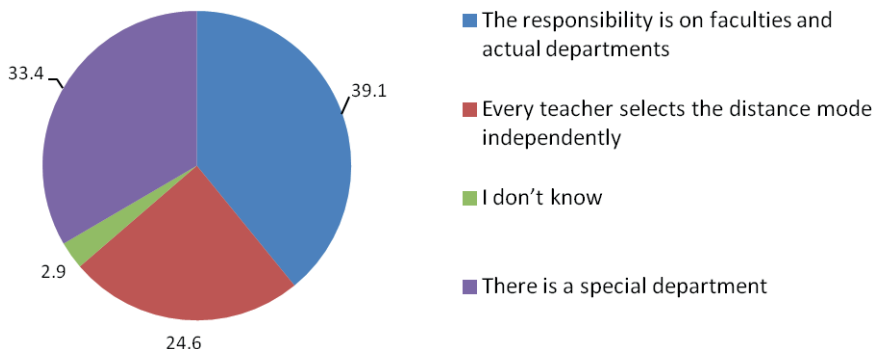


Figure 2. Percentage Distribution Concerning Modes of ICT Use by Universities
Source: Own work.

The analysis of the quality of the educational process and the respondents' use of e-learning technologies showed that the most effective in the educational process for the majority of teachers were virtual educational environments (74.6%) and video communication (ZOOM, Skype, Meet and others) (87.8%). But, unfortunately, only 60% of the interviewed applicants have access to such means in the current situation. At the same time, 74.3% of those seeking education were absolutely positive about the use of messengers for learning, with them being the most accessible tool in the conditions of martial law. In comparison to previous surveys, the percentage of students who find distance learning ineffective has decreased by half (to 6.5%). (Fig. 3).

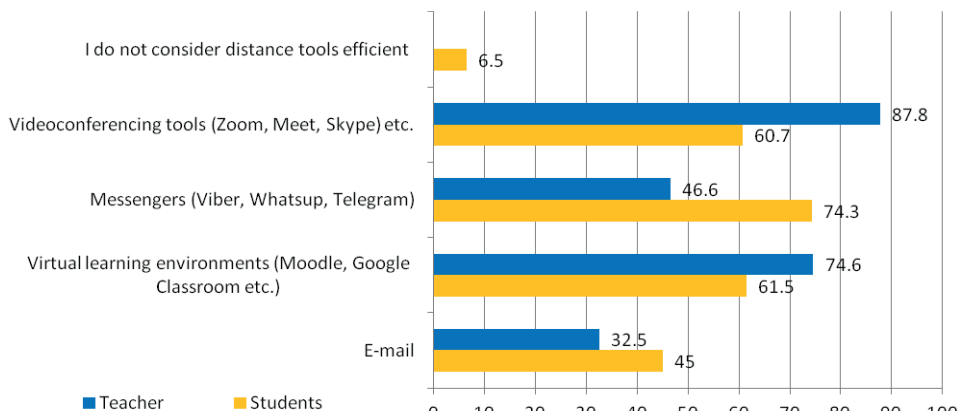


Figure 3. Percentage Distribution as to Digital Tools, Used by the Participants of the Educational Process
Source: Own work.

Even though most universities coped well with the organization of training during war, the applicants are reporting certain problems that degrade the quality of electronic learning technologies. The biggest challenge for students is lack of uninterrupted access to the Internet (55.8%), and every fifth student surveyed points to a lack

of self-organization (19.7%) and lack of the necessary equipment (17.3%). Undoubtedly, these challenges make it difficult to participate in distance learning during martial law. At the same time, we should note that compared to the results of 2020, half as many students of higher education accept the risk of biased evaluation by teachers and complain about the irregularity of communication with the teacher (Fig. 4).

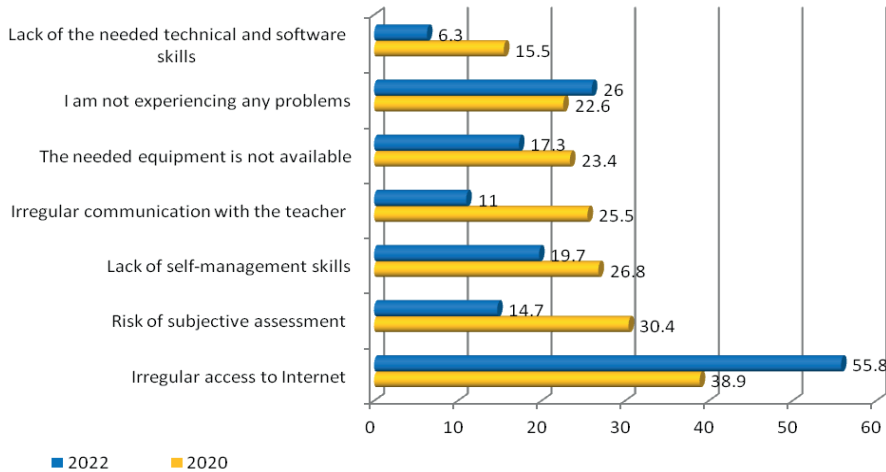


Figure 4. Percentage Distribution as to Problems Faced by Students in Distance Learning (comparison of 2020 and 2022)

Own research, based on (Informatsiino-analytychna dovidka..., 2020) and (Analitichna dovidka schodo..., 2022)

Source: Own work.

The cited results of sociological surveys of participants in the educational process clearly show that e-learning and distance learning are an important factor and indicator of the development of students’ information culture. Such forms of education help develop ICT competencies and boost cognitive skills. In addition, e-learning is psychologically acceptable for students, as it makes it possible to transfer the ability to use gadgets from everyday life and leisure to the educational process.

Thus, fostering information culture in the context of e-learning in a higher educational institution helps improve the quality of the provision of educational services in the information society.

At the same time, according to expert opinions of university teachers, e-learning in higher educational institutions makes it possible not only to improve the quality of educational services, but also helps develop information culture in students only in case of hybrid form of education (Khyzhniak L & Khyzhniak K., 2016). It is exactly this mixed study mode that enables the formation of information culture not only in terms of technology (introduction and use of electronic learning, information and communication technologies, etc.), but also from socio-cultural point of view – the development of the value-meaning aspect of ICT use, the implementation of the principle of humanization, increasing of the creative potential of the individual,

the formation of critical thinking, «live communication» with all participants of the educational process which is an integral part of the formation of the individual's general culture.

3. DISCUSSION

These promising developments in the evolving educational environment align with previous research, suggesting that the COVID-19 pandemic was a unique opportunity for the spontaneous introduction of digital technologies in Ukraine, leading to a long-term digital transformation of higher education (Sorokina et al., 2022).

The current phase in the development of higher education is perceived as globally unpredictable. However, the educational community has also reached a point of no-return (Silva & Alvarez, p. 23, 2021), (Gajewski, 2021). Consequently, the educators are welcome to invite the best attitudes, practices and tools into the coming period. However, despite the increased use of online learning tools (Aristovnik et al., 2023), studies suggest that the era of fully online education has not bridged but rather widened the digital divide in terms of actual access to education (Meulenbroeks et al., 2022), which is a painful fact to acknowledge and the one demanding solutions of the side of the educational management.

Faced with increasingly severe local security challenges, Confronted with yet harsher local challenges to national security, the Ukrainian educational environment finds itself in a more vulnerable position when it comes to fostering student information culture.

CONCLUSION

Developing information culture of a modern specialist is an urgent need of the modern age. In the information society, the expertise and skills necessary for processing information, using digital technologies, largely determines how efficiently professional and social functions of a modern individual are performed.

An individual's information culture is a qualitative characteristic that forms part of their broader professional culture, reflecting their ongoing readiness in professional information-related activities.

The very concept information culture is defined within an integrative approach, which includes both broad (general humanitarian, sociocultural) and narrow (informational and technological) aspects. Thus, information culture includes *information literacy*, *information and digital competency*, *informational reflection* and *informational self-improvement*.

Thus, the introduction of distance learning in institutions of higher education which was spurred by the pandemic and the full-scale invasion of the Russian Federation in Ukraine, gave a rather positive result for all participants of the educational process. Thus, a comprehensive analysis of the problem has identified the following conditions for the effective development of individuals' information culture in universities:

- universities are focused on developing the ability to learn, work with a large amount of information, critically perceive, evaluate and use information;

- the available university infrastructure of information technologies and e-learning tools which includes software, technical and telecommunication tools used in the educational process;
- scientific, educational and methodological provision of the educational environment with access to electronic versions;
- enriching the curriculum by courses that contribute to the development of digital knowledge of students, promote the development of information culture;
- optimal combination of forms and methods of training that activate cognitive activity, including the project method of training;
- professional-oriented problem presentation of educational material;
- formation of students' informational reflection;
- focus of the educational process on self-improvement, self-development of personal and professional qualities of the individual throughout life;
- training pedagogical staff to be confident users of ICTs.

Therefore, one of the tasks of higher education today is to teach individuals to effectively apply information technologies, enabling them to fully realize their potential in the information society, to be able to independently find the necessary information, monitor one's personal and professional skills, monitor changes and respond to them, to be able to make decisions in complex non-standard situations, which is possible only within a robust information culture.

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