The Use of Information and Communication Technologies in the Activities of Higher Educational Institutions of Ukraine

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Abstract

The article provides an overview of analytical studies, presents the main trends, experience and aspects of the integration of information and communication technologies into the education system in the context of the globalization of the information environment, the pandemic of acute respiratory disease COVID-19, taking into account the completion of the MES of Ukraine, the development of standards of higher education at all levels on a competent basis and the challenges of the digital generation, requires alternative forms of education. The theoretical basis of the study was the provisions and concepts of classical, non-classical and post-classical works on philosophy, sociology. The methodological basis of the study was determined by: a systemic approach, a structural and functional approach, a sociological approach. The study used methods of abstraction, generalization, methods of qualitative and quantitative processing of information, methods of comparison, sociological survey. Applying the possibilities of social networks in the educational process involves three areas: an additional opportunity for students to work independently; deepening educational material and educational opportunities; use of online materials by teachers for a variety of text and visual materials for conducting classes, writing plans, lecture notes, scientific articles, organizing educational events.

Keywords

Information Integration, Communication Technologies, Professional Competence, Remote Technologies, Education System.

1. Introduction.

A globalized society requires adequate application of the latest information technologies in the educational process of higher educational institutions in Ukraine. This contributes to the formation of competencies that a modern specialist must have in order to be competitive in the labour market. The use of information and communication technologies is an optimal and effective tool in achieving the triunicity of didactic goals of education: study (perception and understanding of educational material by students), development (search, analysis, synthesis of received educational information); education (formation of professional competencies and professional worldview, ability to study independently and perform group tasks). The advantages of these technologies are the ability to provide interactivity, intensification of the learning process, feedback between the student and the teacher.

A thorough study of the didactic possibilities of using information networks (search, processing, transfer and storage of information) in educational and educational processes in higher education institutions is an urgent task in the context of distance learning. The relevance of this study is due to the importance of studying the opinion of students on the use of information and communication technologies, is one of the indicators of the quality of higher education. The Program of Activities of the Cabinet of Ministers of Ukraine dated 4.10.2019 states that graduates of Ukrainian HEI should be "competitive specialists in the labour market". The program presented the results of national surveys of employers according to which "at least 25% of respondents fully or mainly positively assess the quality of higher education in Ukraine" [1].

The Programme of Activities of the Cabinet of Ministers of Ukraine (June, 2020) identified the need to increase the access and opportunities of people to use the Internet for personal development, conducting their own business, access to public electronic services, by improving digital skills in creating a system of prevention and response, raising the level of awareness of citizens about available services/programs [2].

In particular, the Program notes that the world community of the XXI century faced serious challenges. First of all, for Ukraine, "the negative influence of Russian armed aggression, which began in 2014 and currently continues in the Donbass and Crimea, was intensified by the pandemic of acute respiratory disease COVID-19 caused by Coronavirus disease SARS-COV-2 (hereinafter COVID-19) and the beginning of a global economic crisis" [2].

According to the Cabinet of Ministers of Ukraine, the implementation of the goals (in particular in the sphere of education) specified in this Program will help to ensure "long-term economic and social development of the state" and to turn the existing crisis into "an opportunity for further reconstruction and sustainable development of the country" [2].

2. Materials and Method

The theoretical basis of the study was the provisions and concepts of classical, non-classical and post-classical works on philosophy, sociology. The methodological basis of the study is determined by a number of approaches.

Systemic approach (L. von Bertalanffy, N. Wiener, D. Easton, etc.), which guides the researcher to consider society as a system that functions on the basis of both internal self-development and under the influence of external factors. The structural and functional approach (M. Levy, R. Merton, T. Parsons) as a tool for theoretical research on the functional process of using information and communication technologies allows to consider the functioning of ICT as a coordinated interconnection of elements, is a complex structure and conditions for the performance of certain functions within the whole. This approach allows to analyze the operational architectonics of a functional system of thinking and speech. The sociological approach made it possible to explain social patterns and processes, taking into account the development and interaction of various social groups. The normative approach focused on improving the aspect of higher education and defined the principles for the formation of appropriate state policy.

In the study we used methods of abstraction, generalization, methods of qualitative and quantitative processing of information, methods of comparison, sociological survey. The empirical basis of the study included normative documents regulating educational activities, Internet resources, empirical research materials conducted by the authors, for example, the results of a sociological Internet survey of 606 students of NAU.

Quantitative methods of sociological researches are based on surveys of a certain number of respondents and allow to obtain numerical values of indicators, are investigated. They are designed to study objective, quantifiable characteristics of human behavior, applied when accurate, statistically reliable data are needed. Quantitative research methods are the most used, since their use makes it possible to extend the results of the study to the whole population and to generalize the result to the coverage of many respondents. The results of the studies are statistically reliable, they can be extrapolated to the entire population of the region or to the group for which the study is aimed.

This work proposes methodological approaches to the formation of a sample and a questionnaire for interviewing students on assessing the quality of higher education. In order to ensure the representativeness of the survey, it is advisable to conduct such two stages of the study: 1) aerobatic survey of respondents; in accordance with the justified sample structure, 30 respondents were selected from the FCCPI, FEBA, FAET groups in order to take into account the reasonable recommendations of respondents to improve the questionnaire, identify shortcomings, calibrate the questionnaire; 2) the main survey. According to the results of the pilot survey, the questionnaire was supplemented with a variable part. According to the well-founded sample structure, the aim was to assess the quality and quantity of use of certain information and communication technologies.

The main survey took place in the format of a questionnaire (filling out questionnaires in the electronic version is advisable with quarantine measures related to Covid-2019). The questionnaire consisted of three parts: 1) introduction (target, survey format, filling instruction) 2) of the main block, which, in particular, contained socio-demographic characteristics of respondents, closed and open questions; 3) the results of a sociological online survey of experts, which were 11 teachers (9 teachers of the Department of Ukrainian Language and Culture of NAU M. Kiev, 1 teacher of the Department of International Economics of NAU of Kyiv, 1 teacher of the Department of Documentary Science and the Department of General History, Law and Teaching Methods of the University Grygori Skovoroda, Pereyaslav.)

The sample size of 606 students was determined in case of poor-quality questionnaire completion. To determine the sample size, the total population, the marginal error and the proportion of the test topic in the total population (= 0.5) were indicated. In practice, during the survey, it was possible to interview all the students (were available and agreed to provide information). The sampling error was according to the data actually collected. Total sample size was determined by estimating scores of 0.05 (5%), with a reliability level (coefficient of variation) of no more than 10% with 95% confidence probability level and expected design effect. The estimated sample size was 606 students. Survey data are representative and have acceptable levels of statistical reliability.

3. Results

In order to improve online education in the study of technical and humanities disciplines by students, scientific and pedagogical workers, in the context of distance learning, have received extensive opportunities to monitor a number of issues related to education, moods, preferences and reactions of student youth. The authors conducted a study of the use of information and communication technologies among NAU students. The online stage of the survey was carried out by the authors from April 27 to May 27, 2021. The main sequence of such research included the preparation of a questionnaire accompanying the inventory, conducting an online stage, monitoring the work of interviewers, coding, input and logical control of information. The study sample is random at all stages and representative of the student audience. The main version of the questionnaire in Ukrainian was created. As a result of the online stage, 606 questionnaires were collected. The coding of questionnaires was carried out automatically using the Google form to correctly fill out questionnaires.

606 respondents joined the study and answered the proposed questions, including 46.4% – women, 53.6% – men. The age of respondents is 16 years (16 years old – 14 people, 17 years old – 437 people, 18 – 121 people, 19 years old – 13 people, over 20 years old – 21 people (Figure 1).
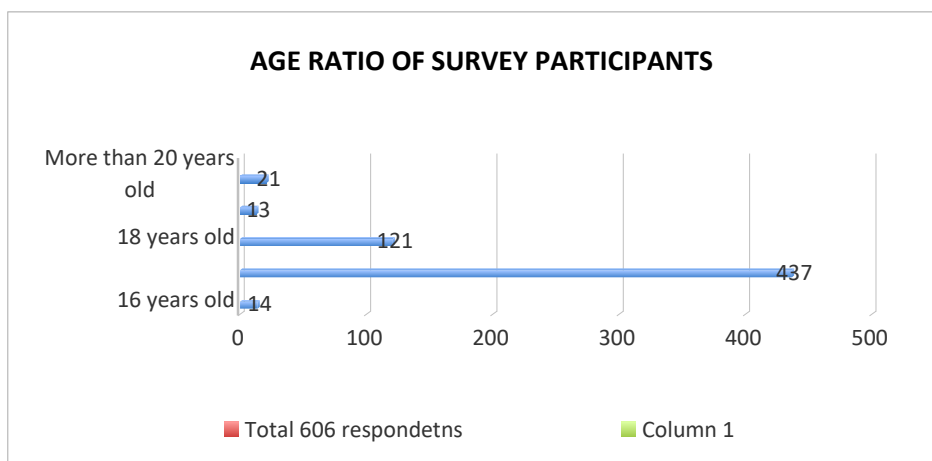
Figure 1. Statistics of age ratio of survey participants

Participants in the survey were young people from different regions of Ukraine (Figure 2).
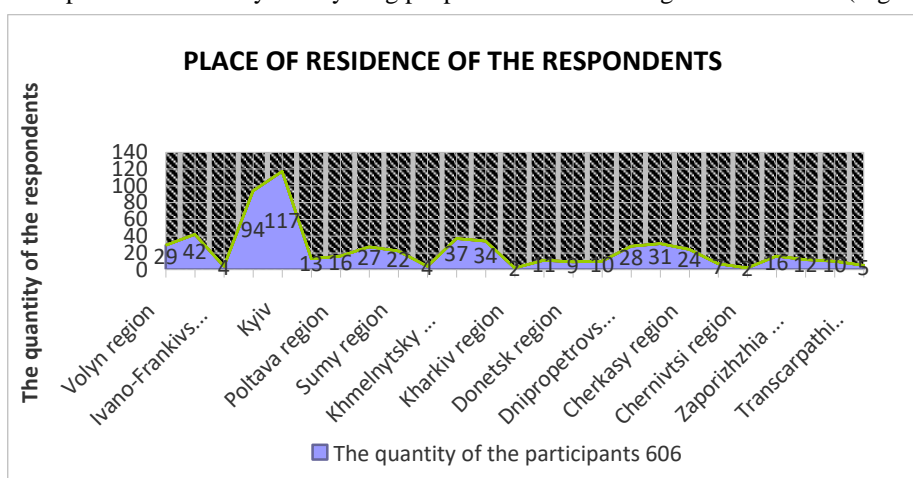

Figure 2. Statistics on the distribution of respondents by place of residence

Analysis of the collected data indicates a high level of use of English, simultaneously with the native Ukrainian language, in the youth environment and a change in the priorities in language choice depending on the situation:
   • search for information on technical and economic disciplines 47% in English, 53% in Ukrainian;
   • search for information on professional humanitarian subjects: 39% in English, 61% in Ukrainian;
   • search for information on philosophy and psychology:
   27% in English, 73% in Ukrainian;
   • listening to lectures of Coursera, Prometheus platform: 62% in English, 38% in Ukrainian;
   • social networks: Instagram, Twitter, posts:
   47% in English, 53% in Ukrainian;
   • viewing popular science films and programs:
   64% in English, 36% in Ukrainian;
   • viewing feature films:
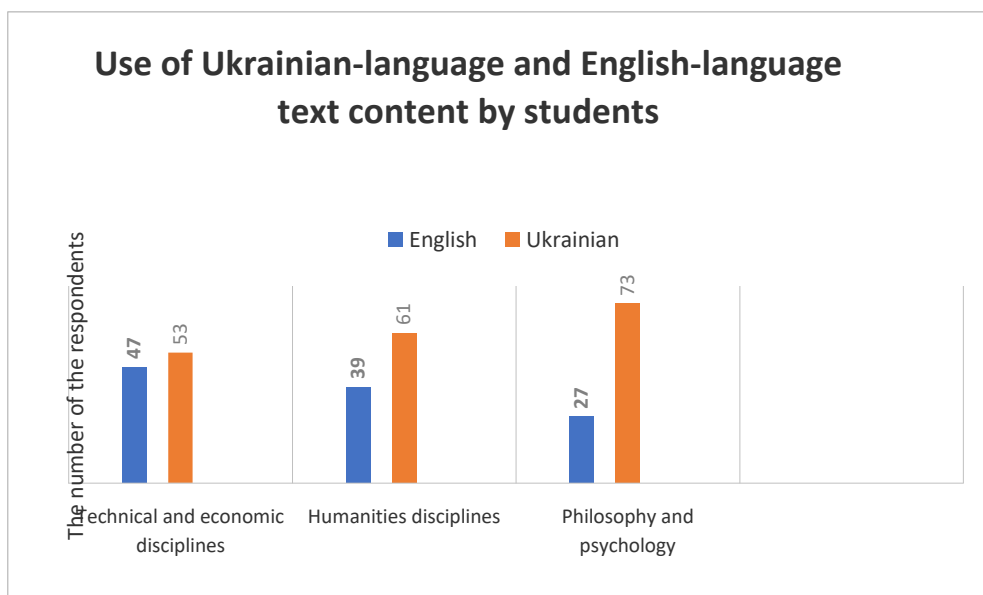   42% in English, 58% in Ukrainian.

Figure 3. Use of Ukrainian-language and English-language text content by students
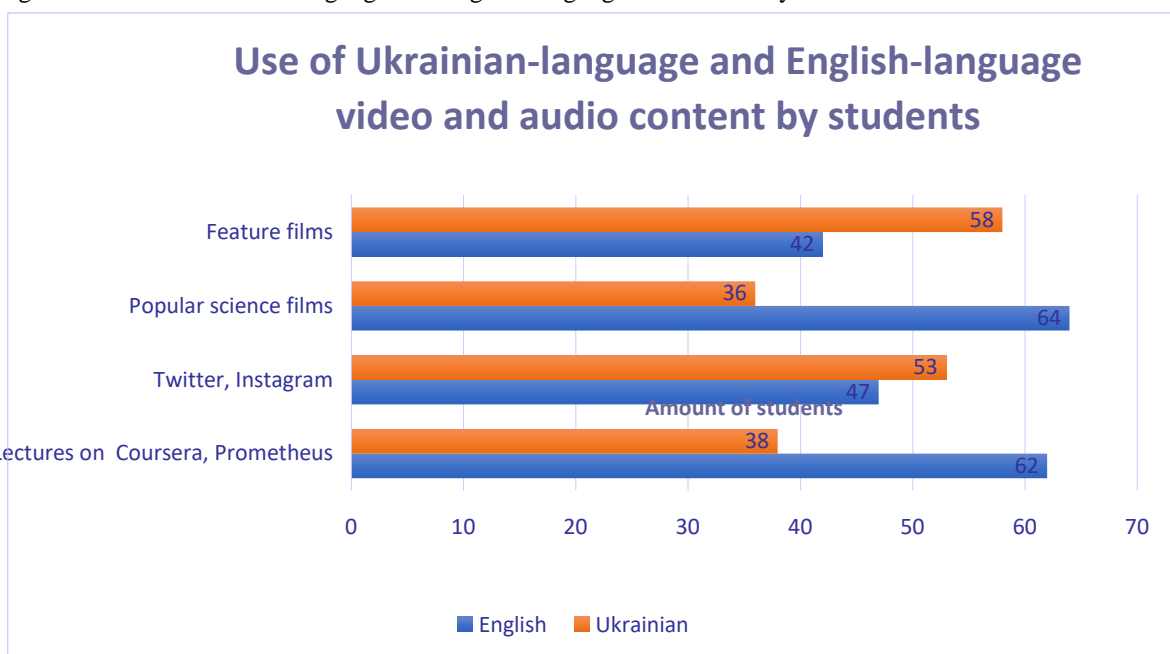

Figure 4. Use of Ukrainian-language and English-language video and audio content by students

It is known that the functioning of a high-quality language information space has a key influence on the formation of the culture and communication skills of each individual. Modern Ukrainian students, in the near future will become specialists in a certain field, are constantly in a bilingual language environment. For example, analysis of a survey of FAET students suggests that 70% of first-year students study professional information using English-language electronic sources.

In the 2020-2021 academic year, the authors of the article suggested that students independently choose educational resources to deepen knowledge of specialized and humanities disciplines. 200 first-year students of various fields of training were selected for the study. First, students had to choose the online resources they knew. Among the students surveyed, 30 could not name a single educational site. In the process of communication, respondents named 2 platforms for online education – the Coursera website (https://www.coursera.org/) and the Prometheus website (https://courses.prometheus.org.ua/login).

The second task for students was to analyze the following 8 platforms for online education:

1. EdEra (https://www.ed-era.com/) – Ukrainian project. This is the site where mass open online courses are located. Among the seven courses presented on the platform, students use lectures, notes, illustrations of courses "Ukrainian Language and Literature," "History of Ukraine."

2. The Academic Earth (https://academicearth.org/) site presents lectures by teachers at the best universities in the world, for example, Yale, Stanford, Harvard, Princeton.

3. The Edx (https://www.edx.org/) site allows you to listen to lectures from leading universities in the world.

4. University of the People (https://www.uopeople.edu/) English-language university-online with exams after each course.

5. VUM - an open university of the square (https://vum.org.ua/) invites to self-education and self-development every citizen who seeks real changes in personal life, in the life of his community, in the life of the state of Ukraine. Students actively joined the online course "What are we still in...." They determined that this course helps the student to better navigate the current situation in the country and society. The course "PRO Parliament: Why do we need deputies" is devoted to understanding the processes of public administration, analyzes the rights, duties and tasks of people's deputies of the Verkhovna Rada of Ukraine.

It should be noted that PO "VUM" in 2021 became a member of the network "Civic Education in Eastern Europe" (EENCE). The mission of the EENCE network contributes to the sustainable development of civil society in the Eastern Partnership region through the development of civic education and the support of organizations and experts working in this sphere. The competition "Best Online Practices" was held as part of the "Week of Civic Education," which was held on October 5-11, 2020. In the context of the pandemic around the world, thanks to modern online communication tools, representatives of 10 countries in Central, Eastern Europe and Asia had the opportunity to share experiences in introducing civic education, as well as evaluate the achievements of partners. The international jury recognized the Platform for Distance Civic Education https://vumonline.ua/ one of the best online practices in the sphere of civic education.

6. Coursera (https://www.coursera.org/) is an English-language project that collaborates with many universities around the world and provides lecture material, offers testing and exams.

7. The Open University (https://www.open.edu/openlearn/) site provides access to systematized educational lecture material.

8. Carnegie Mellon Open Learning Initiative (http://oli.cmu.edu/) offers training and instruction through high-quality, scientifically based online courses and self-study materials. OLI and The Simon Initiative actively participate in the community of open educational resources and are aimed at creating a community of users, researchers, developers to ensure the assessment and improvement of courses and training materials.

The third task for students were to take one of the suggested educational resources. The participants of the experiment were determined as follows: Coursera (https://www.coursera.org/) chose 58 students, Carnegie Mellon Open Learning Initiative site (http://oli.cmu.edu/) – 27 students, VUM – 25 students (https://vum.org.ua/), Edh website (https://www.edx.org/) – 21 students, site EdEra (https://www.ed-era.com/) – 12 students, site Academic Earth (https://academicearth.org/) – 29 students, University of the People (https://www.uopeople.edu/) site – 14 students, The Open University (https://www.open.edu/openlearn/) site – 14 students.

The fourth task was to explain the motivation of free platforms for online education. 58 students expressed their confidence in the site Coursera, because they have already used or seen its advertisement. A separate group of students, which during testing motivates the main factors: understandable interface, impartiality. Interactive Provial facts, large students are pragmatic to figurative platforms. Preference was given to educational platforms, where the professionalism of the presentation is supported by the opportunity to obtain a certificate. It is important that 25 students for testing chose VUM Open University Square (https://vum.org.ua/) through the desire to obtain distance civic education and subsequently take a direct part in public administration processes.
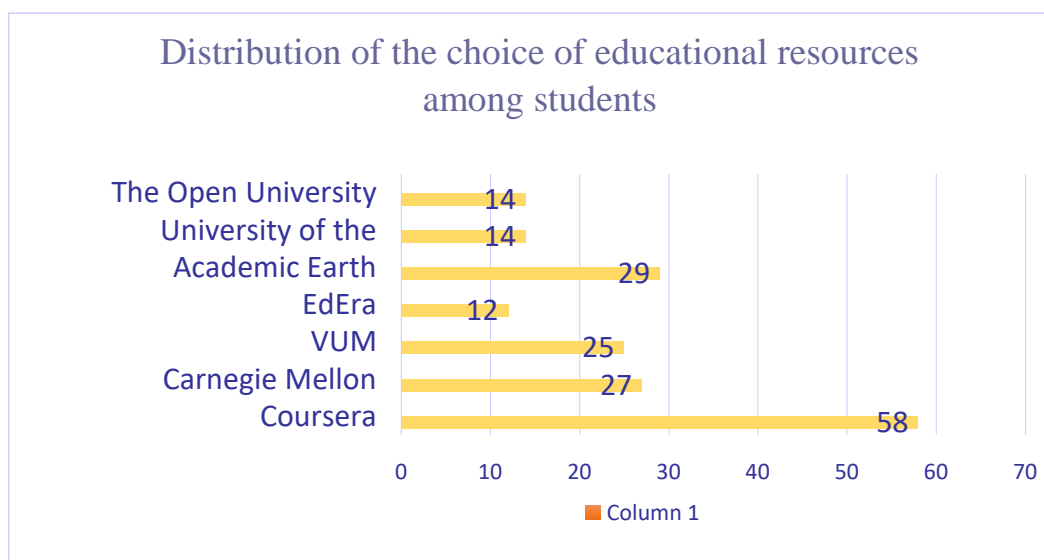

Figure 5 Distribution of the choice of educational resources among students.

4. Discussion

Globalization and modernization have an intense impact on the dynamic development of modern society. Researchers J. Anderson, St. Willer, T. Edward, R. Kling devoted their work to the problems of implementation and technologies of distance learning. N. Levinsky, J. Muller, A. Ogur, D. Parrish, R. Phillips, N. Hara studied information and pedagogical support for the development of distance education.

W. Harvey analyzed the role of scientific communications in the organization of basic research by scientific communities [7].

M. Castells noted that the reason for globalization processes is the use of new technologies while increasing the role of international interaction and information exchange [6]. M. McLuhan believed that the presence of electronic technology is a significant characteristic of the information society [5]. V. Reznichenko analyzed informational leading scientific resources and Internet services [4]. T. Yaroshenko provided an analytical review of electronic resources, educational trends, scientific communications of the information society [3]. Tatyana Skripkina in the article defines modern society as a transitional-turbulent one. This is due to the transitional stage in the era of postmodernism. The author characterizes the realities of the new cultural ethics of modern society. Tatyana Skripkina emphasizes that education is facing an extremely difficult task associated with the formation of young people in new socio-cultural conditions [9].

The article Tatyana Torubarova and Olga Dyachenko is devoted to understanding the problem of human self-determination in the modern social and cultural space, in which the question of personal identity becomes a search for one's own individualization, a question of survival and preservation of man as such. The conducted analysis shows that the key problem of modern society is man himself as a subject of a technotronic-oriented civilization, in which his personal identity is not only a key factor in his existence, but also a fundamental link in the reconstruction of the wholeness of being [10].

Zulfira Zyukina, Yulia Voropaeva and Zoya Zyukina described a modern tool for working in the database of scientific materials Google Book Ngram Corpus. This database contains also materials concerning architecture, construction, machine-buliding fields of research. With its help, connotations of intellectual games in the history of their development were considered [11].

5. Conclusion

The use of information and communication technologies in the educational process forms the motivation of learning and cognitive activity of students of the National Aviation University, affects the development of critical thinking, and deepens their level of scientific knowledge. Students develop information at the level of the test synthesis system prompts the formation of a new information field. The process stimulates students of 1-2 courses to develop communication skills, use information and communication technologies in training, and ensures the actualization of educational, cognitive, scientific, technical, linguistic competence. It promotes the acquisition and practical application of professional knowledge and the crystallization of the conscious civil position of a participant in the development of the Ukrainian state on the principles of European and Euro-Atlantic integration.

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