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# Implementation of a Single Information and Educational Environment of the University “NMU Digital”

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**Keywords:** Digital Transformation, Information and Educational Environment, Distance Learning, Automated Control System.


**Abstract:** The publication considers theoretical and practical approaches to the design and creation of a single information and educational environment of the Bogomolets National Medical University. The main factors that were taken into account in the development of information and educational environment of the university are identified and substantiated. The basic educational and methodical resources that ensure the functioning of the information and educational environment of modern Medical (Pharmaceutical) Higher Educational Establishment (M(P)HEE) are given. The peculiarities of the educational process at the university are analyzed and the scheme of interaction of the educational-methodical department with the faculties of the university is given. In the process of research, it was developed a model of information and educational environment of the Bogomolets National Medical University “NMU Digital”. The list of works related to the educational process performed by the structural units of the university in the automated control system is highlighted. The main advantages of use and functionality of the automated control system, electronic document management system and distance learning platform are revealed and analyzed. The results of an online survey of research and teaching staff and students of different faculties on determining the level of digital orientation are analyzed. Presented a comparison of the results of the survey in 2020-2021 and 2021-2022 academic years on the quality of the organization of a single information and educational environment at the Bogomolets National Medical University.


## 1 INTRODUCTION


Today, every governmental institution (health care is no exception) requires qualified professionals who have a high level of digital skills and are able to work with new technologies. Digital transformation (digitalization) of all spheres of public life, including education and science, is an important area of higher education not only because of the pandemic, but also in general through global trends and national policy (Morze and Strutynska, 2021).


According to the draft of the Concept of digital transformation of education and science for the period up to 2026 (Concept of Digital Transformation, 2021), the resolution of the Cabinet of Ministers of January 30, 2019 No. 56 (Cabinet of Ministers of Ukraine, 2019) and priority areas and tasks of digital transformation for the period up to 2023 approved by the Cabinet of Ministers of Ukraine dated February 17, 2021 No. 365-r (Cabinet of Ministers of Ukraine, 2021) the existing system of education and science must undergo radical digital changes and meet global trends in digital development for the successful realization of each person’s potential. Acquisition of digital competencies is a basic need of a modern specialist, so the education system (Medical (Pharmaceutical) Higher Educational Establishment – M(P)HEE) should ensure the formation of digital competencies of students and research and teaching staff (Kuzminska et al., 2019), as well as initiate the introduction of


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digital infrastructure and electronic services.

The digital transformation of higher medical education is an integral part of the digital society as a whole, where there is a rapid filling of the world with digital technologies, systems, as well as with their help to establish communication and data exchange. These processes contribute to the development of digital competencies of the subjects of the educational process and are aimed at building an innovative, open and secure digital environment of the university.

Problems of design, implementation and use of an open cloud-oriented educational and scientific environment of a higher education institution have been the subject of research by (Bezverbnyi and Shyshkina, 2022; Bykov et al., 2019; Glazunova et al., 2022; Kolgatin et al., 2022; Oleksiuk and Spirin, 2022; Oleksiuk et al., 2021; Osadcha et al., 2022; Spirin et al., 2019). The researches of (Fedorenko et al., 2019; Kartashova et al., 2022a,b; Hurzhii et al., 2018) are devoted to the analysis of informatization of general secondary and higher education in Ukraine. The study of some features of informative terminology is revealed in (Zhaldak, 2019). Morse and Varchenko-Trotsenko (Morse and Varchenko-Trotsenko, 2015) considers the design of the model of effective learning environment of the university using information technology. The research of Spirin and Vakaliuk (Spirin and Vakaliuk, 2017) is devoted to the definition of criteria and establishment of appropriate indicators for the selection of open web-based learning technologies, Trius and Sotulenko (Trius and Sotulenko, 2017) talks about problems of creating distance learning support systems for health professionals. Franchuk (Franchuk, 2020) analyzes and systematizes the most common web-based computer systems in higher education. Stuchynska et al. (Stuchynska et al., 2021) consider approaches to the design and creation of a cloud learning environment for medical students. Marin (Marin, 2021) describes different practices which attempted to enact a digital university: MOOCs and videoconferencing apps used for lecturing. Michaeli et al. (Michaeli et al., 2021) investigate the digital changes that have taken place in medical school that are related to the pandemic COVID-19. Rosenman and Swanson (Rosenman and Swanson, 2020) discusses the advantages and disadvantages of using digital platforms and wearables, as well as the problems of "Digital Health" in Medical School. Maltese (Maltese, 2018) offers new methodologies, data models, authority control mechanisms, and system infrastructures that are able to support a broader range of services in digital university.

Purpose of the article is presentation of design experience and general approaches to creating a single

information and educational environment of Bogomolets National Medical University "NMU Digital".

## 2 METHODS

Theoretical and empirical methods of scientific research were used to perform the set tasks, namely:

- method of system analysis, comparison and generalization for theoretical substantiation and development of information and educational environment of the Bogomolets National Medical University "NMU Digital";
- bibliosemantic method – for the study of psychological and pedagogical, scientific literature, regulations on the design of information and educational environment, the use of automated control systems and distance learning technologies;
- empirical methods – conversations with students and teachers, analysis of ways to use learning materials management systems;
- questionnaire – in order to determine the level of digital orientation of students and research and teaching staff of the university;
- modeling – to develop the information and educational environment of the university and analyze its functionality.

## 3 RESULTS AND DISCUSSION

First of all, it is necessary to consider the essence of the concepts of "digital competence" and "digitalization of education" to understand the need for the formation of certain skills in the subjects of the educational process when working in the information and educational environment. In the Recommendations of the European Parliament and of the Council (Council Recommendation, 2018), digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking. Carretero et al. (Carretero et al., 2017) defines the digital competence not only as the ability to use the latest digital technologies, but also as the ability to use these digital technologies in a critical, collaborative and creative way. In particular, this

publication identifies five main structural components of digital competence, namely:

1. literacy of information operations (viewing, searching, filtering data, information and digital content; evaluation of data, information and digital content; data, information and digital content management),
2. communication and cooperation (interaction through digital technologies; sharing of digital technologies; involvement in active public activities through digital technologies; cooperation with the help of digital technologies; network etiquette; digital identity management),
3. creation of digital content (digital content development; integration and processing digital content; copyright and licenses; programming),
4. security (device protection; protection of personal data and privacy; protection of health and well-being; protection of the environment),
5. problem solving (solving technical problems; identifying needs; creative use of digital technologies; defining spaces in numbers competence).

According to (Bykov et al., 2020), digitalization of education “is a modern stage of its informatization, which involves saturation of information and educational environment with electronic-digital devices, tools, systems and electronic communication between them, which actually allows integrated interaction of virtual and physical, that is, it creates a cyberphysical educational space”. In turn, the information and educational environment will be understood as a continuum of spatio-temporal, socio-cultural, activity, communicative, informational and other factors that appear as conditions for interaction between the developing individual and the objective world of higher education, which are purposefully created and arise spontaneously. Obviously, for effective interaction between the user and the information and educational environment, the subject of the educational process must have established digital competencies.

The results of the analysis of scientific and pedagogical literature allow us to interpret concept of “informational and educational environment” as a continuum of spatio-temporal, socio-cultural, activity-oriented, communicative, informational, and other factors that appear as conditions of interaction between the developing individual and the objective world of higher education that are purposefully created and arise spontaneously. Kasatkin and Tverezovska (Kasatkin and Tverezovska, 2011) gives another interpretation of this concept, namely as a system-organized set of tools, information resources,

interaction protocols, hardware and software, and organizational and methodological supports, focused on meeting the educational needs of users. In particular, the educational environment of M(P)HEI is a necessary component of the holistic mechanism of professional socialization, life, and professional situations that ensure the entry of students into professional life.

The results of the analysis of scientific and pedagogical literature allowed to identify the main factors that were taken into account in the design and creation of information and educational environment of the university, namely: widespread use in the educational process of computer-based learning technologies; practical implementation of distance learning technologies; providing ICT support for research; wide introduction of digital technologies in education management at different levels; use of cloud technologies; taking into account the features of different computer technology platforms. In the course of digitalization, it is necessary to consider such principles as:

- ensuring access to data and knowledge;
- compliance with the system;
- focus on the development of a single information and educational environment;
- organization of communication, partnership and international cooperation;
- ensuring digital security and management priorities.

Analyzing the experience of organizing training with the help of distance technologies in institutions of higher medical (pharmaceutical) education, it can be stated that important educational and informational and methodological resources for the formation of the educational environment are:

- official portal of the institution of higher education;
- structured media library;
- thematic collection of video, audio materials, printed materials, methodical materials that provides the maximum visualization of educational, scientific and methodical activity, satisfies the interests of real and potential consumers of educational services in terms of the content of educational activities;
- virtual library – an electronic library with educational, educational and methodical, methodical literature, catalogs of other electronic libraries;
- distance learning courses or their elements as a form of organization and implementation of educational activities and self-education of students using ICT.

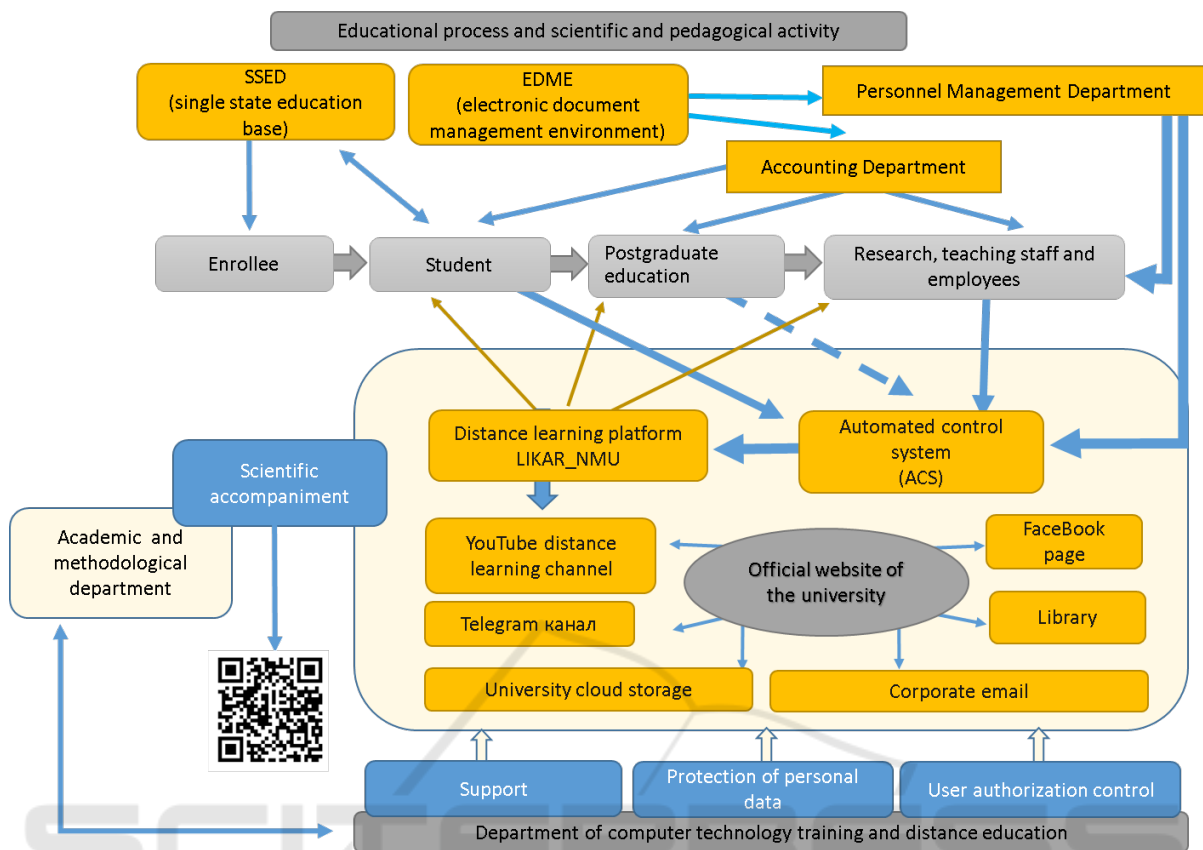


Figure 1: Model of information and educational environment of the Bogomolets National Medical University “NMU Digital”.

Information and educational environment of the Bogomolets National Medical University is based on the use of the latest technologies and provides the educational process with electronic textbooks and teaching aids in relevant disciplines, guidelines for the use of various web services, resources, and creates conditions for: introduction of pedagogically balanced learning models, use of cloud and mobile-oriented learning environments, use of various virtual laboratories, monitoring of academic achievements and disclosure of personal abilities of students.

The modern educational environment of M(P)HEI must meet a number of conditions, namely:

- to have the aesthetic appeal of the elements of the environment;
- to ensure compliance of the content and means of education with modern requirements for medical (pharmaceutical) education;
- to provide professional, psychological, and pedagogical needs of scientific and pedagogical workers and students; to have a positive image that contributes to the successful positioning of M(P)HEI in Ukraine and abroad;

- to have a high level of pedagogical skills, general and social culture of the teaching staff;
- to provide conditions for the formation of a competitive specialist in the medical (pharmaceutical) industry.

Thus, the informational and educational environment M(P)HEI in distance learning can be understood as a systematically organized set of modern educational and other information resources focused on meeting the needs of participants in the educational process and its scientific and educational support, as well as a set of hardware and software for storing, processing, and dissemination of educational materials and communications interaction to achieve educational aims, in particular in order to form the necessary professional competencies.

In figure 1 shows a model of information and educational environment of the Bogomolets National Medical University “NMU Digital”. First of all, all electronic data of entrants are entered by the staff of the Admissions Committee into the Unified State Electronic Database on Education (USEDE) and as soon as the entrant is enrolled in the number of university students, he/she immediately becomes part of

the digital environment. All data of the entrant goes to the ACS, and thanks to the integration of the ACS with the university distance learning platform LIKAR NMU, students of our university will have access to video and teaching materials on the YouTube distance learning channel in the disciplines taught to them this or that semester. Orders on the movement of the contingent (enrollment, transfer, deduction or academic leave) of students are formed in the ACS and transferred to the electronic document management environment (electronic management system – EMS), and from there to the necessary departments.

Based on distance learning technologies, it is possible to provide access to a wide range of information resources – from assistance in performing specific practical work and autonomous training courses downloaded to the student’s mobile device, to fully networked training courses with problem-oriented software running on the server. It is also important that distance learning solves the problem of professional development of those who live and work in remote areas and helps to solve cost problems. Distance learning is currently impossible to imagine without systems of software products (distance learning platforms), through which remotely, via the global internet, the student can master the material, and the teacher in turn can create distance learning courses and conduct distance learning. The use of such platforms provides an interactive connection between teacher and student; distribution and verification of control tasks; keeping an electronic journal of records of assessments and visits; setting up various course resources; integration with cloud technologies. Using the latter opens up new learning opportunities, provides almost unlimited storage space, and most importantly – provides access from various devices to server resources and does not “tie down” the user to the workplace.

Let’s consider the features of training at Bogomolets National Medical University, which are due to the “specific” organization of both the educational process and its structure. These features include: different duration of initial classes (1, 2, 3 and 5 hours); availability of monodisciplines (the department of a certain faculty teaches the same discipline for students of different faculties); academic disciplines for students of the faculty are taught by scientific and pedagogical employees of the departments belonging to other faculties. Analyzing the scheme of interaction of the educational and methodical department with the faculties of the university (figure 1) it can be traced that the students of the pharmaceutical faculty have academic disciplines taught by different departments, which in turn belong to different faculties, for

example:

- faculty of training of foreign citizens (disciplines: “Information Technology in Pharmacy”, “Higher Mathematics and Statistics”, “Latin”);
- medical faculty No. 1 (“Human Anatomy”);
- medical faculty No. 4 (“Hygiene and Ecology”).

Sometimes one department is taught by several departments, for example, the discipline “Life Safety, Fundamentals of Bioethics and Biosafety” will be divided between the Department of Hygiene and Ecology No. 3 of the Medical Faculty No. 4, and the Department of Philosophy, Bioethics and History of Medicine.

In accordance with figure 2, the logical sequence of interaction is as follows: the educational and methodical department calculates the pedagogical load and forms the schedule of educational classes; faculties (dean, deputy dean, methodologists, dispatchers, inspectors) form lists of student groups, monitor academic performance, make curricula into the automated control system (ACS), etc. Having received the previously mentioned information from the educational and methodical department and faculty, the responsible persons from the department assign teachers in the schedule by groups, publish thematic plans for disciplines (calendar-thematic plans of lectures, practical and seminar classes, as well as independent work of students) syllabuses and regulations. classes, final modular controls. In addition, they fill in grade journals, attend lectures, and fill in information on academic performance.

During the period of adaptive quarantine and digitalization of education it is important to ensure not only students’ access to educational and methodical material, but also a reliable communicative component between students, departments, faculties and educational and methodical department and other structural units of Bogomolets National Medical University, as well as automation of processes related to the placement or completion of information. Especially important is the support and assistance to research and teaching staff of the university in organizing the provision of quality educational services.

At present, it is important to install a new ACS module, namely its synchronization with the ACTION application. In particular, the following documents are available for “sharing”:

- Passport of a citizen of Ukraine in the form of an ID card;
- Biometric passport;
- Registration number of taxes;
- Internally Displaced Persons (IDP) certificate;

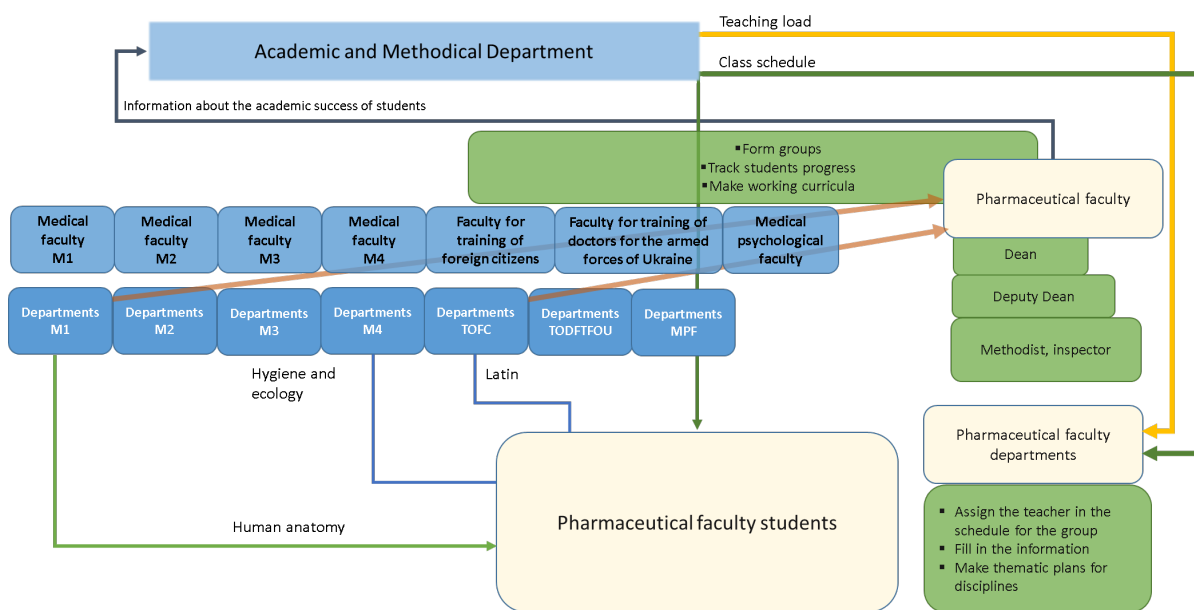


Figure 2: Scheme of interaction of the educational and methodical department with the faculties of the university.

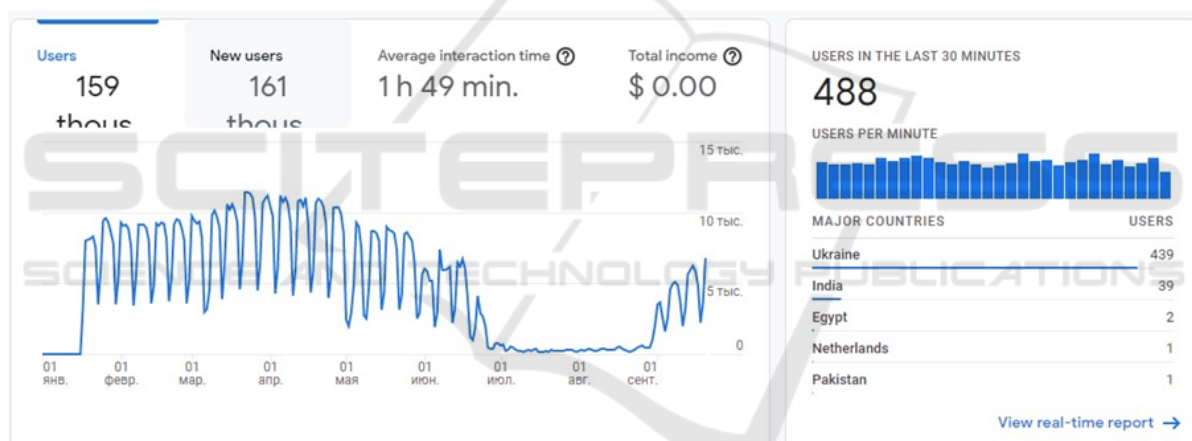


Figure 3: Attendance statistics of the LIKAR NMU distance learning platform.

- Child's birth certificate.

In addition to working in the ACS, research and teaching staff carry out organizational and pedagogical activities on the distance learning platform LIKAR NMU (develop and fill distance learning courses and YouTube distance learning channel). Three modules are available on the LIKAR NMU distance learning platform: distance learning; deanery; the organizational structure (figure 3).

The scientific and pedagogical staff of the university developed almost 2000 video recordings of lectures and video recommendations for practical and laboratory work, which were uploaded to the YouTube distance learning channel of Bogomolets National Medical University. The mantis is placed

(figure 4). The channel currently has more than 3,000 subscribers.

In order to optimize the information support and counseling of higher education students, teachers, course managers and faculty members responsible for educational work, support chats were created in Viber and Telegram messengers. In addition to the organizational and control function, the university administration together with the educational and methodical department and the department of computer technology of learning and distance education provides constant scientific support, updating instructions, publishing methodical materials and scientific articles placed in the rubric "Distance learning" on the official website of the university, as well as step-by-step video

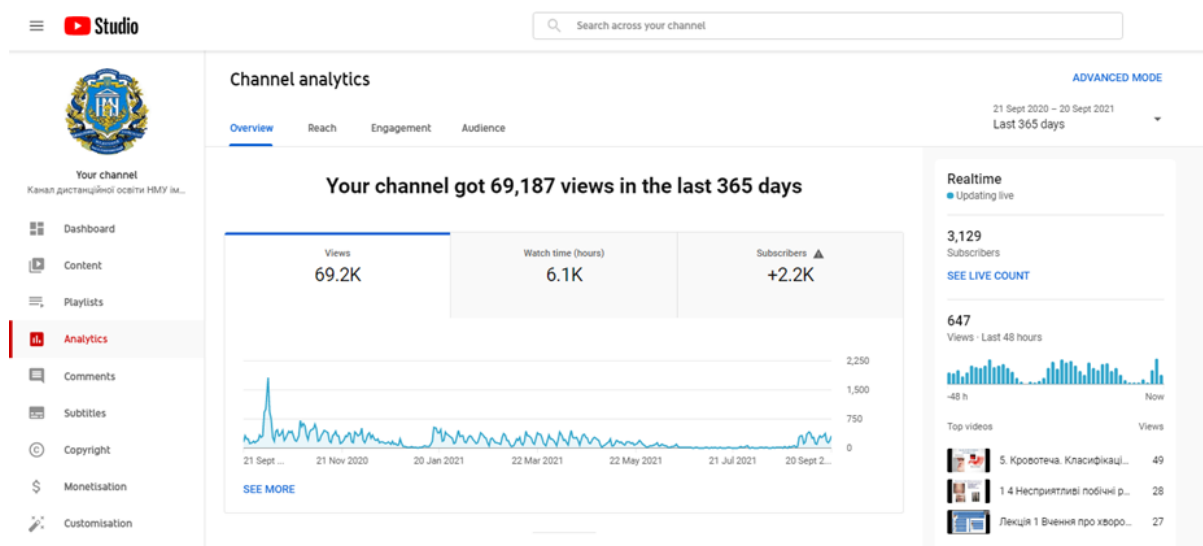


Figure 4: Analytics of views of the YouTube distance learning channel of Bogomolets NMU.

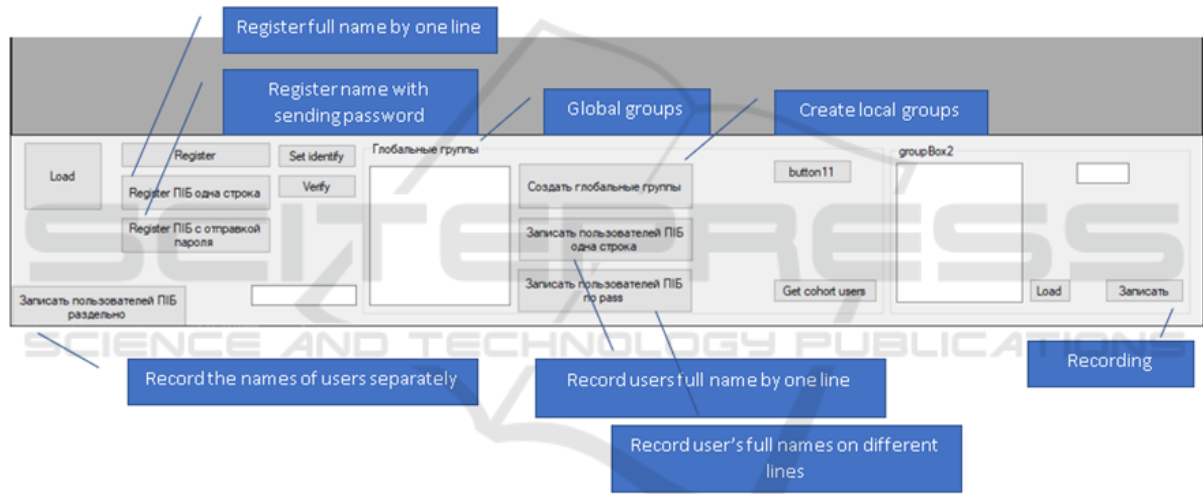


Figure 5: Application window for optimizing user registration without an ACS account.

instructions for teachers were recorded and posted on the distance learning channel.

With regard to postgraduate education, this includes interns and students of advanced training or technical improvement courses. In fact, we have former students of our university, information about which was stored in the ACS and on the platform LIKAR NMU and new users. Data on graduates is stored on the distance learning platform, and software was developed for unregistered users, which solved the problem of fast data transfer from the spreadsheet, and registration of users absent in the ACS (figure 5). This software application is designed for local use.

In addition, a special module on the LIKAR NMU platform has been developed for advanced training and technical improvement courses, which allows

generating certificates confirming the completion of training courses. These certificates indicate the educational institution, name, subject of the training course and the date of completion.

An important role in the interaction between structural units is played by the environment of electronic document management (EMS). Thanks to EMS, the hierarchy of management actions of the university administration, structural units and faculties is clearly traced and adhered to. Quite convenient is the fact that the order or order of the university can be immediately sent to all necessary users for review, signature or review. The head of the structural unit has the opportunity to review the status of execution of the order and find out whether all colleagues are performing their duties properly. This is quite convenient, espe-



cially when there is a powerful institution and structural units are located in different parts of the city, you do not need to spend time and resources on the way to the office building and waiting in line for signatures under offices, most importantly to have constant access to the Internet.

In the process of designing an information and educational environment of the university, it was expedient to establish the readiness of the teaching staff and students of different faculties to use digital technologies in their activities. In order to determine the level of digital orientation of research and teaching staff and students of Bogomolets National Medical University a questionnaire was conducted. A total of 939 respondents took part in the survey, of which 87 were faculty, 817 were full-time students and 38 were part-time students.

Respondents were asked to rate their own components of digital competence on a 5-point scale:

- Respondents rated information literacy as follows: 37% – by 5 points, 46% – by 4 points, 14% – by 3 points, 2% – by 2 points, 1% – by 1 point.
- Respondents rated communication and cooperation as follows: 45% – by 5 points, 38% – by 4 points, 13% – by 3 points, 3% – by 2 points, 1% – by 1 point.
- Respondents rated the creation of digital content as follows: 25% – by 5 points, 36% – by 4 points, 27% – by 3 points, 8 – by 2 points, 4% – by 1 point.
- Respondents rated data protection as follows: 29% – by 5 points, 33% – by 4 points, 27% – by 3 points, 7% – by 2 points, 4% – by 1 point.
- The solution of technical problems was assessed by the respondents as follows: 23% – by 5 points, 33% – by 4 points, 30% – by 3 points, 9% – by 2 points, 5% – by 1 point.

Table 1: Distribution of respondents depending on the position.

Academic title	2020-2021 a.y.	2021-2022 a.y.
Professor	1.5%	2.3%
Docent	3.3%	7.3%
Senior Lecturer	0.2%	0.9%
Teacher	0.3%	1%
Assistant	3.8%	6.6%
Full-time student	86.5%	72%
Part-time student	4.1%	7.7%
Intern	0%	1.7%
Postgraduate	0%	0.3%
Other	0.3%	0.1%

As can be seen from the results of the answers to this question, most respondents assess themselves at a sufficient level of digital competence. It was also suggested to assess one's own level of interest in the use of digital tools:

- Work on the global Internet: 65% respondents have a high level, 30% respondents have a medium level, and 5% respondents have a low level.
- Visualization: 63% respondents have a high level, 34% respondents have a medium level, and 3% respondents have a low level.
- Ensuring cybersecurity: 45% respondents have a high level, 38% respondents have a medium level, and 17% respondents have a low level.
- Scientific communication: 51% respondents have a high level, 40% respondents have a medium level, and 9% respondents have a low level.
- Electronic documents: 53% respondents have a high level, 38% respondents have a medium level, and 9% respondents have a low level.
- Mobile devices: 71% respondents have a high level, 24% respondents have a medium level, and 5% respondents have a low level.

It can be stated that the majority of respondents are interested in using digital tools when working on the global Internet and with mobile devices, at least in ensuring cybersecurity of data.

In response to the questionnaire "In your opinion, what are the main requirements to be met during the digital transformation of education?", distance learning technologies were identified in the first place, research learning and blended learning in the second and third, respectively (figure 6).

To the question "Do you have the skills to create digital content?" the following answers were received: 51.9% of respondents have a basic level (I create simple digital content (text, tables, images, audio files) in at least one format), 39.5% of respondents have a medium level (I create complex digital content in different formats (for example, text, tables, images, audio files) and have the skills to create web pages or blogs); 8.6% of respondents have a high level (I create complex multimedia content in different formats, using a variety of digital tools and environments, I can create a website).

To the questionnaire question "Do you have the skills to create digital content online in cloud storage (for example, Google Drive or Dropbox)?" such answers were received, 58.4% indicated that "yes", 41.6% – "no".

To the question "Do you have the skills to use e-mail and messengers (for example, Viber, Telegram or

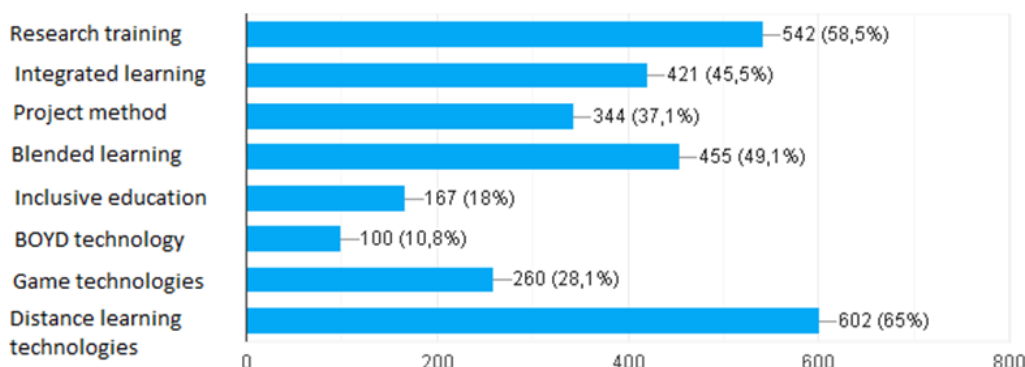


Figure 6: Distribution of respondents' answers to the main requirements should be provided during the digital transformation of education.

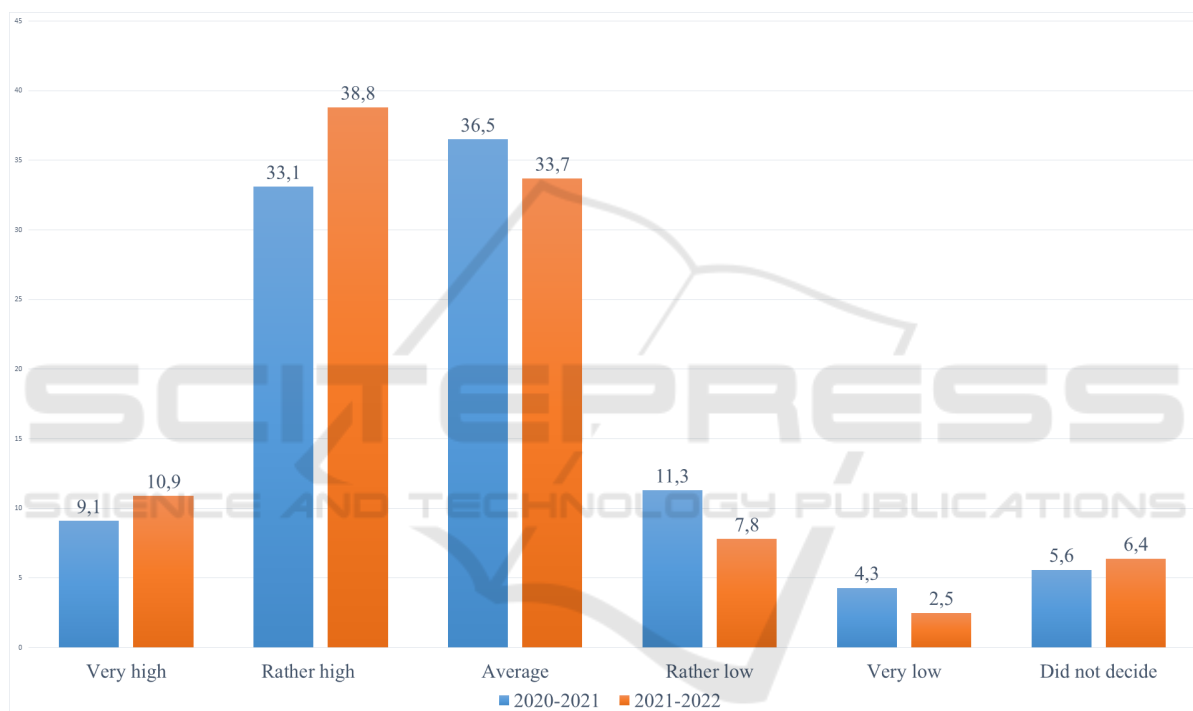


Figure 7: Distribution of respondents' answers to the question "How would you assess the quality of education at the Bogomolets National Medical University?"

WhatsApp) in professional activities?" the following answers were received, 97.1% – said “yes”, 2.9% – “no”. Having studied the attitude of respondents to the organization of the educational and information environment of Bogomolets National Medical University we can note that 44.4% are completely satisfied, 37.9% are undecided, and 17.7% are dissatisfied. Analyzing satisfaction with the quality of information support, the following results were obtained: 44.5% were completely satisfied, 35.5% were undecided and 20% were dissatisfied.

In order to study the quality of the organization of a single information and educational environment at

the Bogomolets National Medical University for the last 2 years has been conducting online surveys of research teaching staff and students of various faculties. In 2020-2021 academic year 4610 respondents took part in the survey, and 2021-2022 academic year 3940 respondents (table 1). The following results were obtained after the survey. To the question of the questionnaire “How would you assess the quality of education at the Bogomolets National Medical University?” (figure 7) in 2020-2021 a.y. 78.8 % of respondents answered positively, 15.6 % of respondents considered the level of education rather low or very low and 5.6 % did not decide on the answer. In 2021-2022

a.y. the distribution of respondents answers was as follows: 83.4 % of respondents answered positively, 11.2% of respondents considered the level of education rather low or very low and 6.4 % did not decide on the answer.

To the question "How would you assess the quality of education at the Bogomolets National Medical University for distance learning in adaptive quarantine?" 2020-2021 academic year the following answers were received: 45.3% – very high and high, 35.3% average quality score; 16.2% – low and very low and 3.2% of respondents did not decide on the answer. Since 2021–2022 a.y. training was carried out according to the classroom–distance form of education, the question of assessing the quality of the form of education was posed as follows: "How would you assess the quality of education at the Bogomolets National Medical University the classroom–distance form of education in the conditions of adaptive quarantine?" respondents' answers are divided as follows: 44.3% – very high and high, 35.9% average quality score; 15.8% – low and very low and 4.9% of respondents did not decide on the answer. However, regardless of the form of student learning, whether distance or mixed, the issue of improving the quality of distance learning at the Bogomolets National Medical University. The worshiper remains relevant today. Last educational year, 57.2% of respondents believed that this issue is a priority, this year 42.4% share this opinion.

In 2020-2021 academic year answering the question "Do you agree with the statement that distance learning puts everyone on an equal footing?" The opinion of the respondents was divided: 30% – said they completely agreed, 29.6% – mostly agreed, 13.5% – mostly disagreed, 16.2% – completely disagreed and 10.6% did not decide on the answer. In 2021-2022 a.y. The distribution of respondents' answers was as follows: 29.3% – said they completely agreed, 31.1% – mostly agreed, 15.2% – mostly disagreed, 14.4% – completely disagreed and 10% did not decide on the answer. In addition, it is appropriate to determine the form of organization of the educational process that most puts students in a level playing field.

In 2020-2021 academic year 68.9% of respondents were satisfied with the organization of distance learning, 13.1% – rather dissatisfied and 17.9% found it difficult to determine the answer. This year we had a task to determine how many respondents are satisfied with different forms of education at the university (figure 8): classroom, mixed, distance. It should be noted that the combination of classroom and distance learning has become commonplace for teachers

of the Bogomolets National Medical University. Answering the question "Can distance learning affect the reduction of corruption?" 64.1% of respondents indicated that "rather yes", 16% – "probably not", 19% – did not decide on the answer. In 2021-2022 a.y. respondents' answers were divided as follows: 57.4% of respondents indicated that "rather yes", 19.9% – "probably not", 22.7% – did not decide on the answer. As for the use of additional tools to provide distance and classroom distance learning, it is the same as last year – Zoom and GoogleMeet are preferred. As the epidemiological situation in the country is constantly preparing new challenges for the education and health care system, students and teachers have to adapt to change. It is important, regardless of the form of classes to convey the necessary information to students, and get a positive result of its assimilation. Constantly improve pedagogical skills, following modern methods and teaching methods.

#### **4 CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH**

The designed single information and educational environment "NMU Digital" unites all participants of educational and scientific activity, providing space for communication and data exchange, simplifies and modernizes management processes at the university. The implementation of the proposed concept aims to ensure: a qualitatively new level and effectiveness of the university; development of a unified information educational environment of the university; high level of quality of training and advanced training of students; increasing the efficiency and effectiveness of research; high level of digital competence of university employees.

The information and educational environment developed at the university consists of many components. Its organization involves not only the use of modern digital technologies, such as automated document management system, distance learning platform, automated control system, YouTube, telegram channel, official website, but also establishing communication between all structural units of the university, creating conditions for the formation of digital competence in order to work in the information and educational environment of the university. Analysis of the results on the level of digital orientation of teaching staff and students of Bogomolets National Medical University gives grounds to conclude that a significant number of respondents need to improve

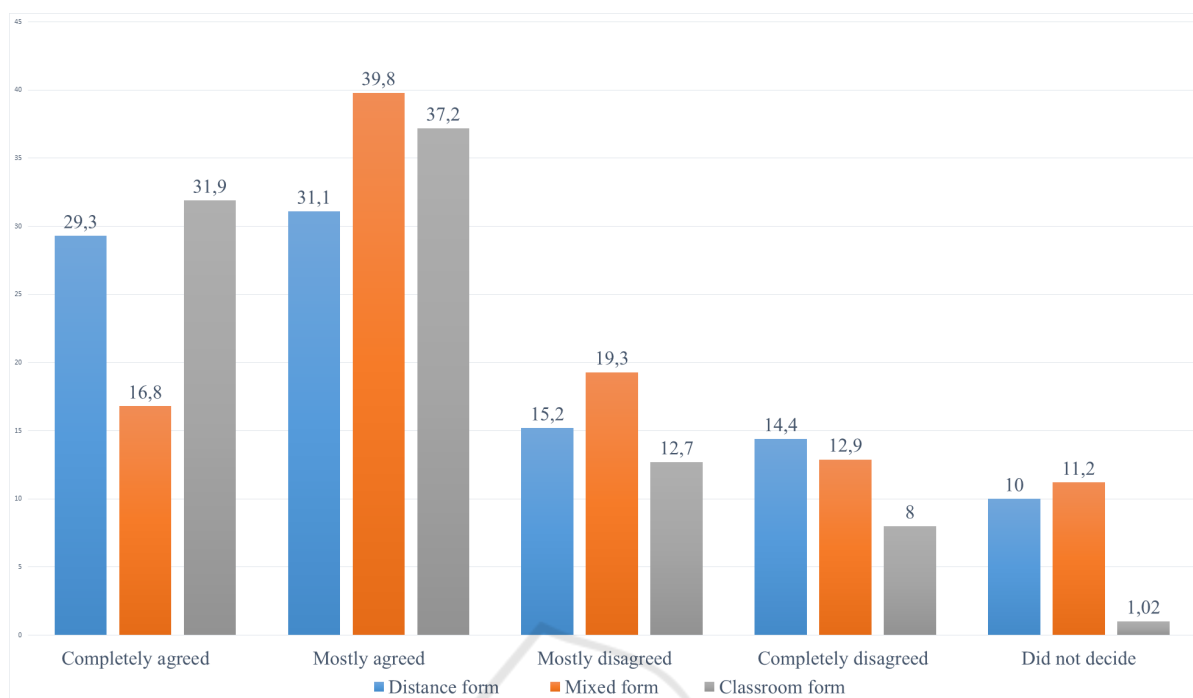


Figure 8: Distribution of respondents' answers to the question "Can distance learning affect the reduction of corruption?"

their digital competence. Most users have high skills in working on the Internet and with mobile applications, this applies mainly to students. In our opinion, it is possible to expand knowledge in other directions by updating the content of computer science disciplines. As for the teaching staff, web training's and seminars should increase their digital competence. Tracking the dynamics of digital competence changing is a prospect for future research, as the process of creating information and educational environment of the university is long and is implemented in stages. The results of the conducted sociological research will contribute to the creation of new opportunities for adjustment, development, and functioning of the informational and educational environment of the university. As we can be seen from the results of the comparison of 2020-2021 and 2021-2022 academic years, the percentage of respondents who positively assess the quality of education at the university has increased. Most likely, this is due to the introduction of a mixed form of education and the establishment of mechanisms for interaction between students and teachers.

Prospects for further research are aimed at developing proposals for ways to develop digital competence of students and research and teaching staff of the university. The proposed concept for the design of information and educational environment of the university needs constant improvement and in our

opinion, the results of sociological research will help create new opportunities for adjustment, development and functioning of the information and educational environment of the university.

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