_____

V. Tkachuk, ScD in economics, Professor, Department of Economics, National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

ORCID ID: 0000-0002-9684-8625
e-mail: vadtkachuk@hotmail.com

R. Schlauderer, ScD in Agricultural Sciences, Professor for Applied agricultural management, University of Applied Sciences Weihenstephan-Triesdorf, Triesdorf, Germany

ORCID ID: 0000-0003-1598-0091
e-mail: ralf.schlauderer@hswt.de

N. Kovalenko, PhD in economics, Associate Professor of the administrative management and foreign economic activity Department, National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

ORCID ID: 0000-0003-0621-8214
e-mail: nperederiy@nubip.edu.ua

O. Labenko, PhD in economics, Associate Professor of the Finance Department, National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

ORCID ID: 0000-0001-9192-9891
e-mail: labenko@nubip.edu.ua

V. P. Strokal, candidate of Pedagogical Sciences, Associate Professor of department of agrosphere ecology and environmental control, National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

ORCID ID: 0000-0001-6876-1111
e-mail: vita.strokal@gmail.com

Digitalization of Educational Process in Ukraine: the Challenges for Students and Lecturers

***Abstract. Introduction**. The Pandemic has led to considerable changes in the sphere of education and it also brought about some educational problems in Ukraine. The level of education has direct influence upon incomes and employment of population: people who are better educated can find jobs more easily, have better working conditions and higher salary. Moreover, higher level of education is positively connected with life expectancy, health and social integration. At the beginning of the quarantine in the spring of 2020 all the educational facilities switched over to distance learning and closely experienced the process of digitalization which was becoming of increasing importance. In this research we decided to concentrate on the actions taken in the organization of educational processes during the quarantine caused by COVID-19. Also we delineated educational problems of digitalization which were faced by participants of the studying process: student community and lecturers.*

Purpose.
Results.
Conclusions.
***Keywords:** digitalization; educational process; COVID-19; informatization.*

УДК 33.303/37-042.4:004

Ткачук В. А., доктор економічних наук, професор кафедри економіки, Національний університет біоресурсів та природокористування України, м. Київ, Україна

Шлаудерер Р., доктор економічних наук, професор з прикладного аграрного менеджменту, Університет прикладних наук Вайєнштефан-Тріздорф, м. Тріздорф, Німеччина

Коваленко Н. О., кандидат економічних наук, доцент кафедри адміністративного менеджменту та зовнішньоекономічної діяльності, Національний університет біоресурсів та природокористування України, м. Київ, Україна

Лабенко О. М., кандидат економічних наук, доцент кафедри фінансів, Національний університет біоресурсів та природокористування України, м. Київ, Україна

Строкаль В. П., кандидат педагогічних наук, доцент кафедри екології агросфери та екологічного контролю, Національний університет біоресурсів та природокористування України, м. Київ, Україна

_____

_____

Диджиталізація освітнього процесу в Україні: виклики для студентів та викладачів

Актуальність теми зумовлена змінами, що виникли в освітній траєкторії через пандемію. Зокрема рівень освіти прямо впливає на доходи та зайнятість населення – краще освічені люди легше знаходять роботу, мають кращі умови праці та більше заробляють. Крім того, вищий рівень освіти позитивно пов'язаний із тривалістю життя, здоров'ям та соціальною інтеграцією.

На початку карантину навесні 2020 р. всі заклади освіти перейшли на дистанційне навчання і тісно стикнулися з процесом диджиталізації, що набувала все більшого значення. Під час дослідження було зосереджено на тому, якими були дії в організації навчального процесу в університетах під час карантину, спричиненого COVID-19. Також нами окреслено освітні проблеми під час диджиталізації, з якими стикалися учасники навчального процесу: студентство та викладачі.

Як результат впровадження основних положень диджиталізації, в університеті було проведено опитування викладачів та студентів щодо їхнього відношення до онлайн навчання (Блок 1), можливостей якісного викладання в умовах дистанційного навчання (Блок 2) та технічного забезпечення (Блок 3). Відповідно Блок 1 – відповідав за якісну характеристику впровадження диджиталізації в університеті, Блоки 2-3 – за кількісну. За результатами опитування встановлено, що якісна характеристика впровадження диджиталізації в освіті базується на «викликах» як: гнучкий робочий час, можливість використання цифрових технологій, мобільність, доступність освіти з будь-якої точки світу, безпека (позитивні сторони диджиталізації); погане забезпечення Інтернет-зв'язком та погіршення комунікативних компетентностей (негативні сторони диджиталізації). Також обґрунтовано думку респондентів щодо впливу викладання предметів лише он-лайн на якість освітнього процесу є різнобічною.

У процесі досліджень було обґрунтовано вагомість забезпечення працівників освіти та студентство технічними засобами (комп'ютери (ноутбуки), мікрофони, навушники тощо), які є важливою умовою ефективного дистанційного навчання та важливим елементом при реалізації диджиталізації в університеті, особливо в умовах пандемії, яка обумовила розвиток цифрової освіти. У цілому, підсумовуючи результати опитування, варто зазначити, що впровадження диджиталізації в університеті є важливим кроком для покращення дистанційного навчання, оскільки спрямована на формування цифрової освіти в сучасних умовах. Відмічено за результатами, що технічне забезпечення викладачів та студентів потребує удосконалення, що стимулюватиме всіх зацікавлених сторін освітнього процесу до впровадження інноваційних методів та технологій викладання, як розробка відеолекцій. Своєю чергою, це сприятиме підвищенню якості та ефективності навчального процесу. В майбутніх дослідженнях автори планують провести опитування на факультетах різних спрямувань і порівняти результати впровадження процесів диджиталізації в залежності від фаху, що опановують студенти.

Ключові слова: диджиталізація; освітній процес; COVID-19, інформатизація.

Formulation of the problem. Higher education plays the prominent role among the factors of society's economic development. Progressive development of every country depends precisely on the professionalism of specialists who are trained in institutions of higher learning. Today higher education is getting new traits and spreading its functional tasks. In the context of increasing demands of employers to the level of professionalism and competence of workforce and increase in the scale of intellectualization of work, higher education serves not only as means of providing economy with highly qualified personnel but also as a necessary precondition for human development, welfare and high social status. Due to this, evermore wide groups of society are encompassed by higher education [1]. In the modern world many countries witness transformations connected with the formation of postindustrial and cyber society. Primary importance is gained by the problems connected with the change of paradigms in the philosophy of education. Postindustrial society presupposes rapid development of informational technologies, which means that the most important role is played by intellectual kinds of work and that's why education comes first [2].

Global informatization and digitalization of the society is one of the dominant tendencies of the civilization development in XXI century. Due to the rapid increase of possibilities of cyber means and cutting-edge informational technologies the new digital environment of living and habitation for people is being formed thus creating preconditions for a new informational society. In this society not only substantially new possibilities are provided for people but also previously unfamiliar problems are arising. [3] Today modern cyber and communication technologies are used in activity of almost every enterprise and organization. Current century is characterized by intensive development and implementation of digitalization in all the spheres of social life. It's displayed in intensive improvement in computing hardware and means of communication, in appearance of new and further up-grading of already existing cyber technologies and also in realization of applied informational systems. Accomplishments of digitalization have occupied an important place in organizational management, industrial production, carrying out of scientific research and automatized engineering. Digitalization has encompassed even the social sphere: education, science, culture, medicine. By means of the internet a significant quantity of users turn to the services provided in those spheres [4].

The COVID-19 pandemic has speeded up the process of cyber transformation that had been already implemented in universities. It also brought up new challenges — universities had to quickly make two changes:

• Learning had to be adapted and improved according to the requirements of the new cyber format

• New formats had to be found for those educational programs which require social interaction, interaction with people, technology, and environment—

_____

for example, medicine, natural sciences, engineering, agronomical science, zoo technology and so on [5]

Cyber education is always a struggle between possibilities and limitations. As an example of the problems, we can mention the process of development and evaluation of exams that would stand to the requirements of the law while trying to avoid technical problems [6]

Among the great possibilities and new achievements, we can count the format of using interactive video-materials, developed courses on the electronic platforms, application of interactive methods of testing and evaluation of students' knowledge. Digitalization also saves time as it eliminates the necessity of commuting to the university [7,8].

In our research we are interested in finding the answer for the following questions: are lecturers and students are going to accept digitalization for a long time and use it after the end of pandemic? To what extent the format of distance learning is useful for both groups? Are professors and students in Ukraine technically ready for distance learning?

Analysis of recent research and publications. Starting from 2020 The National University of Life and Environmental Sciences of Ukraine is one of the enforcers of «Digital Modernization of Lecturing in Ukrainian Agricultural Universities» (DAAD Project № 57514792). The mission of this project is getting experience in increasing of cyber competence of all participants of the educational process in particular during studying, communication among professors and students and implementation of new telecom networks in the university. The university constantly strives to improvement both in educational environment and in cyber and in cyber one, so there was implemented the system of control over server computers of educational clusters based on cloud technologies. In the educational space there functions the integrated database of the users of e-environment.

Formulation of research goals. Investigate the process of digitalization in the educational process in Ukraine, taking into account the challenges for students and teachers.

Outline of the main research material. In order to conduct the study, we developed questionnaires for testing participants in the educational process, who were divided into the following groups: undergraduate students of the first and second years of study, undergraduate students of 3-4 years, graduate students and lecturers. This gave us the opportunity to range the students into:

•	Sample group 1, the students of which began and continued most of their studies only during the pandemic in a hybrid format and mostly online (undergraduate students of 1-2 academic years);

•	Sample group 2, the students of which began their studies and initially studied only in-person format, and then moved to a hybrid format (undergraduate students of 3-4 academic years);

•	Sample group 3, the students of which spent most of the time of the educational process studying in-person (graduate students);

•	Sample group 4, which consists of lecturers who can objectively evaluate both formats of learning - in-person and on distance.

As a result of the implementation of the main objectives of the project, in the university there was conducted polling of lecturers and students concerning their attitudes to online learning (Block 1), opportunities for quality teaching in distance learning (Block 2) and technical support (Block 3). Accordingly, Block 1 summarizes the qualitative characteristics of the implementation of digitalization at the university and Blocks 2-3 show the quantitative ones. 255 respondents took part in the polling (Fig. 1), including 229 students (225 students from the Faculty of Plant Protection, Biotechnology and Ecology, 3 students from the Faculty of Agrobiology, 1 student from the Faculty of Economics) and 26 representatives of the research and teaching staff.
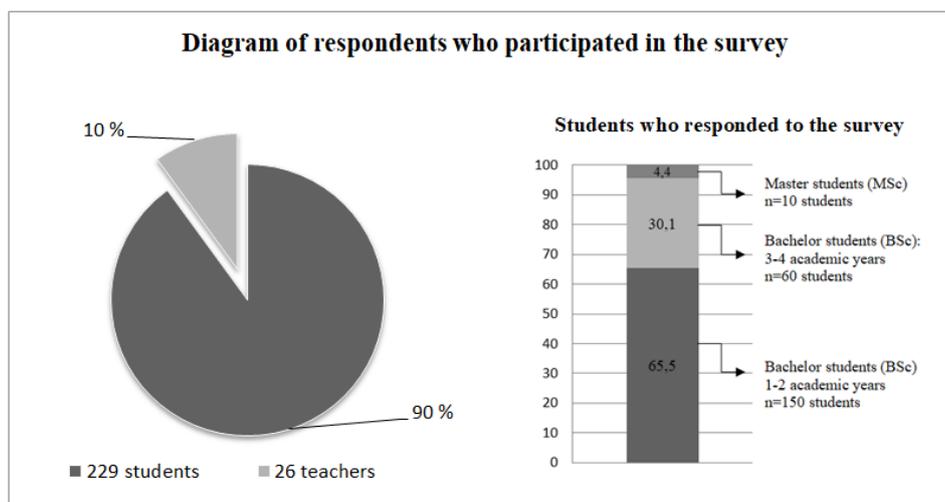

Figure 1 – **Distribution of respondents who took part in the survey by categories**

Source: authors' calculation

_____

As we can see from the Figure 1, the survey involved students of all courses, which were divided into three categories: students of the degree "Bachelor" 1-2 years if study (sample n = 150) and 3-4 years of study (sample n = 60), graduate students (sample n = 10).

Results. In the last two years, in the period of the COVID-19 pandemic, digital technologies have been becoming increasingly important for the educational process. The transition from offline to online (or hybrid) learning has led to the introduction of digital education to universities, which involved the use of various components of digitalization: online education, electronic educational resources, electronic document management, learning through digital technologies, and development of competences, needed in the digital world [9]. The information and educational environment of distance learning is a systemically organized set of data transmission tools and information resources focused on meeting the educational needs of users. The specific feature of distance learning is flexibility in space and time, as well as in the use of digital technologies for the unification of teaching and obtaining learning materials [10].

The main opportunity to evaluate the new "challenges" in digital learning related to the digitalization of universities is to discuss the results of the polling, which relate to the attitude of respondents to online learning (Block 1 of the questionnaire). This block of questions included the distribution of respondents by categories and their attitude towards the forms of education. Also, in this block the respondents outlined the positive and negative aspects of distance learning.

It should be noted that none of the respondents from research and teaching staff preferred distance learning. Their opinions were divided between in-person and Hybrid forms of education. As we can see from the results of the polling (Fig. 2), 61.5% of research and teaching staff preferred in-person education.

This category of respondents believes that the main disadvantages of distance learning are limited Internet connection for both teachers and students. It was also noted that during distance learning, the connection and communication with students is often lost, it is difficult to demonstrate practical and laboratory material in the online learning environment, the acquisition of practical skills by students deteriorates, and eyesight is endangered. However, as the main advantages of distance learning, they mentioned: flexibility in time, safety in the conditions of pandemic, the convenience of evaluating the work of students with the online system, the ability to participate in various international events even during a pandemic, educational mobility. The category of respondents who preferred a Hybrid form of education (38.5%) believes that the main advantages of distance learning are: learning from anywhere in the world, accessibility and mobility of education. Both categories of respondents mentioned that the advantage of distance learning is the possibility to use different digital technologies to demonstrate educational material (videos, interactive programs, etc.), and the disadvantage - the deterioration of communicative and practical competencies of students.
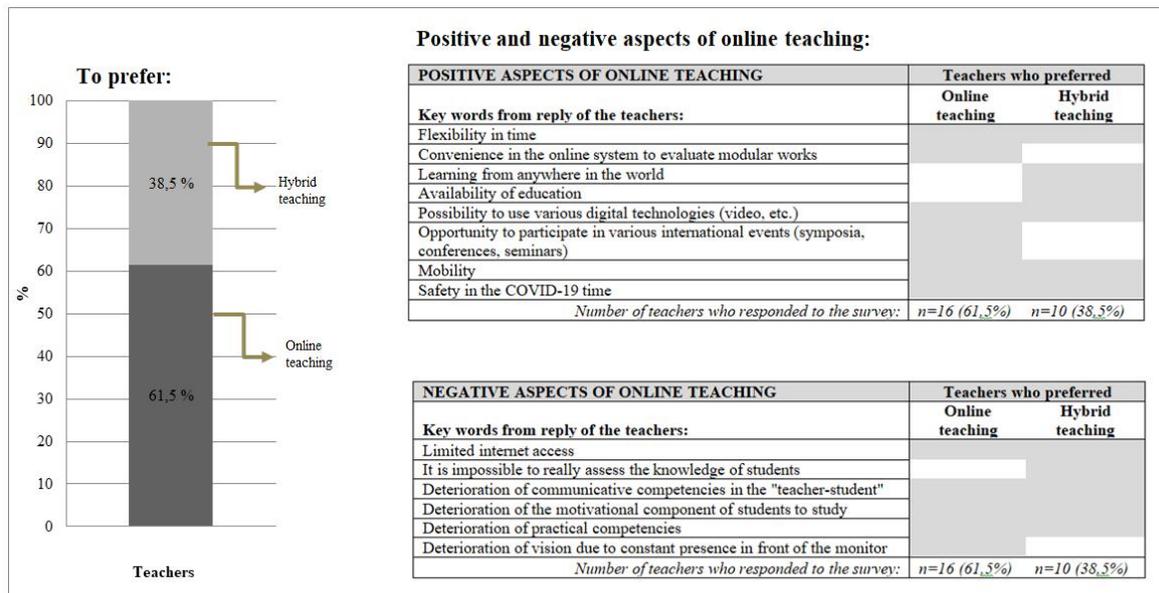

Figure 2 – **Distribution of respondents from research and teaching staff based on the results of the answer to the question: "What form of training do you prefer? Characterize the advantages and disadvantages of distance learning"**

Source: authors' calculation

The results of the students' answers to the question "What form of study do you prefer?" are significantly different from the results of teachers. As we can see from Figure 3, 37% of the students preferred in-person education, 33% - distance learning, 30% - the Hybrid one.
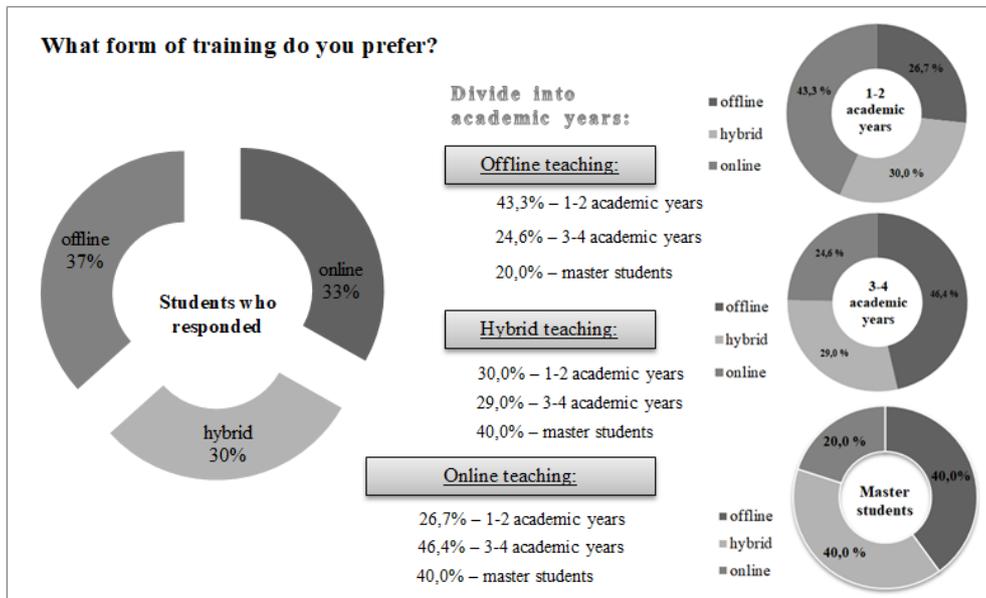

Figure 3 – Distribution of respondents – students based on the results of the answer to the question: "What form of training do you prefer?"

Source: authors' calculation

If we consider the results of the polling on this question in the light of different years of study, we can observe the following trend: students of 1-2 academic years prefer in-person education (43.3%), students of 3-4 academic years - distance learning (46.4%), students of educational degree "Master" - a hybrid system of education (40%). It should be noted that students of 1-2 academic years included to the advantages of distance learning flexibility in time and space and convenience (Table 1).

Table 1 Advantages of distance learning based on the results of the polling among students

Positive aspects of online teaching			
Key words from reply of the students	**BSc (1-2)**	**BSc (3-4)**	**MSc**
Flexibility in time (when to work) and space (where to work)			
Free time or save time for personal development			
Mobility			
Convenience			
Opportunities to make working place confortable to personal needs for effective learning process			
Safety in the COVID-19 time			
Number of students who responded to the survey	*n=150*	*n=69*	*n=10*

Source: authors' calculation

The students of 3-4 academic years singled out as an advantage of distance learning - the opportunity to make their work (study) place more comfortable. Also, all categories of students mentioned that the advantages of distance learning are the preservation of free time which creates the opportunity for self-development and mobility during the pandemic.

As is shown in the Table 2, among the disadvantages of distance learning all students mentioned limited Internet connection, blackouts, impaired learning of practical material due to the impossibility of its application in the laboratory.

Table 2 **Disadvantages of distance learning according to the results of the polling among students**

Negative aspects of online teaching			
Key words from reply of the students	BSc (1-2)	BSc (3-4)	MSc
Limited internet access			
Limited electricity supply			
Limited interactions with teachers and fallow students			
Not effective learning of new materials because of lack of off-line practical or absence of off-line practical			
Challenges to concentrate and perceive information from monitors			
Decrease in the eye health because of continuous use of online tools			
Overloaded with writing exercises in the online systems			
Number of students who responded to the survey	*n=150*	*n=69*	*n=10*

Source: authors' calculation

From the results described above, we can conclude that the qualitative characteristics of the implementation of digitalization in education is based on the "challenges" that are revealed in the advantages and disadvantages of distance learning. It should be noted that the main advantages of distance learning are flexible working hours, the ability to use digital technologies, mobility, access to education from anywhere in the world, security. Among the main shortcomings of this form of education were mentioned poor Internet connection and deteriorating communication skills.

According to the results of the survey, the opinions of respondents on the impact of teaching subjects only online on the quality of the educational process are diverse. In particular, the majority of representatives of research and teaching staff (84.6%) noted that with the constant teaching of subjects online, the quality of the educational process can deteriorate significantly. The opinions of students, regardless of the year of study, are more even. Approximately 50% of students also believe that the quality of the educational process can deteriorate significantly if it is carried out online (Fig. 4).
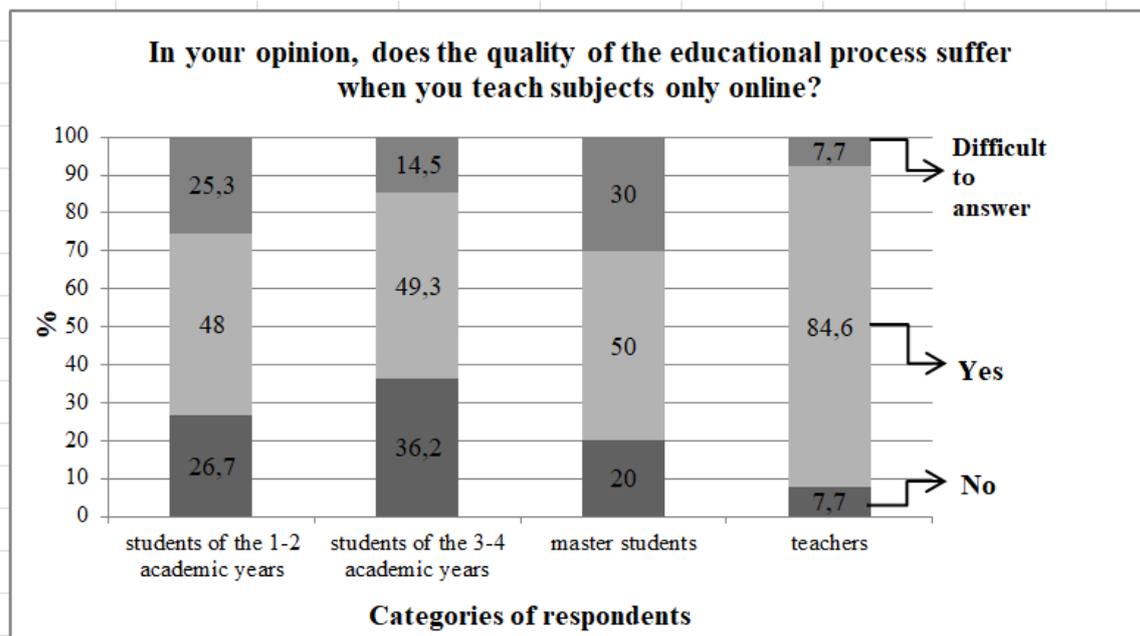

Figure 4 – **The opinions of respondents on the impact of teaching subjects only online on the quality of the educational process**

Source: authors' calculation

Turning to the justification of the respondents' answers in the questionnaire of Block 2 (opportunities for quality distance learning), it should be noted that the questions of this block reveal the quantitative characteristics of distance learning, taking into account

places were classes take place and opportunities to concentrate during them, conditions of communication (Internet connection) and forms of classes (group). It should be noted that the effectiveness of online classes is

_____

significantly influenced by the place where they take place and their technical and information support.

For the question: "Do you have a place where no one interferes during online classes?" respondents gave different answers (Fig. 5). In particular, students of 1-2 academic years (91%) and students of educational degree "Master" (80%) mostly have places for online classes, 88.4% of students of 3-4 years - mostly no places for classes. As for teachers, 57.7% have places for online classes where no one will disturb them, 42.3% do not have such places.
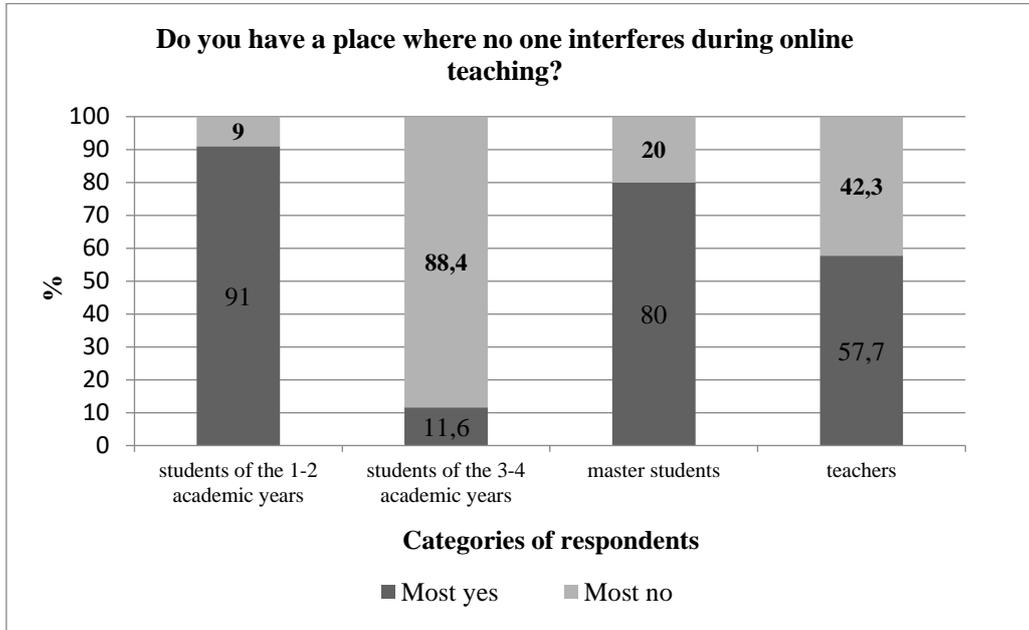
Figure 5 – **Respondents' opinions on the possibilities of conducting online classes in places where no one interferes**

Source: authors' calculation

While giving explanations for their answers for the question "Do you have the technical facilities and a good Internet connection for online learning?" (Fig. 6), almost all students answered that they have the technical means and a good Internet connection for online classes (90.1% - students of 1-2 academic years; 92.8% - students of 3-4 academic years; 100% of graduate students).
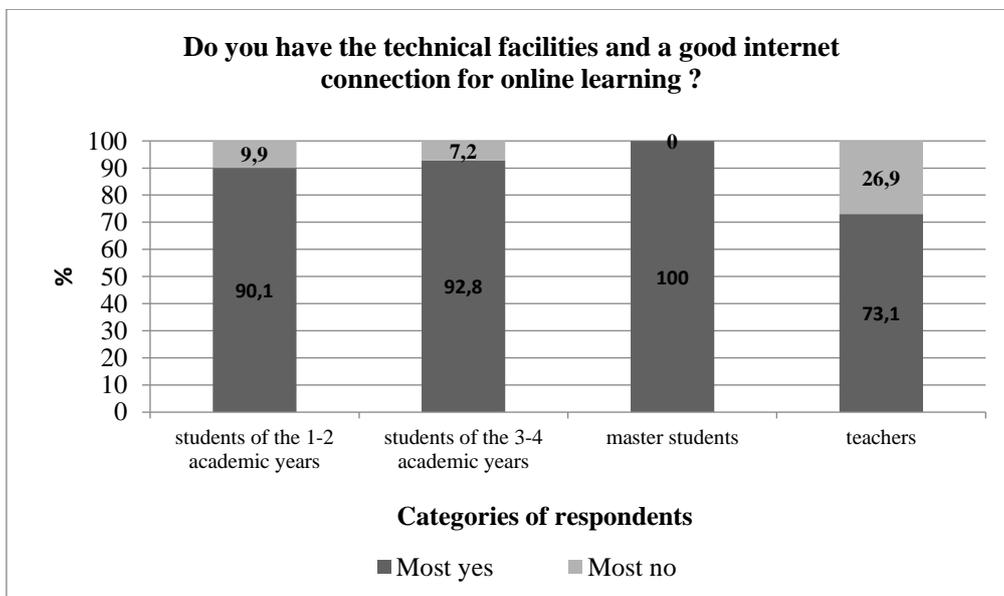

Figure 6 – **Respondents' views on the availability of the technical facilities and Internet connection for online classes**

Source: authors' calculation

_____

_____

It should be noted that the effectiveness of delivering lectures and providing practical material for the students and the effectiveness of mastering this material by students depends on the availability of the proper place for online classes. Concentration during classes is not an integral part of distance learning. The results of the polling of respondents on the possibility of concentration during online classes at the university, at home or in any other place are shown in Figures 7-9.
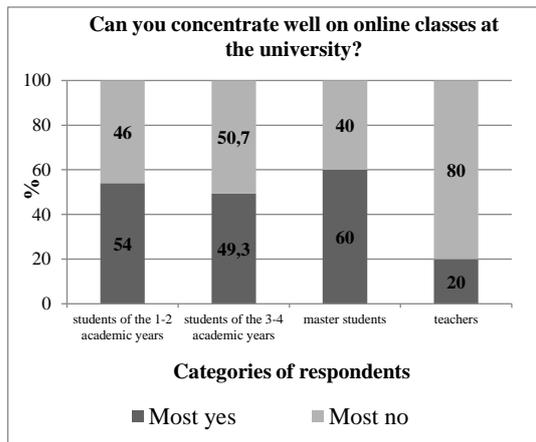

Figure 7 – Opinions of the respondents on the possibility to concentrate on online classes at the university.
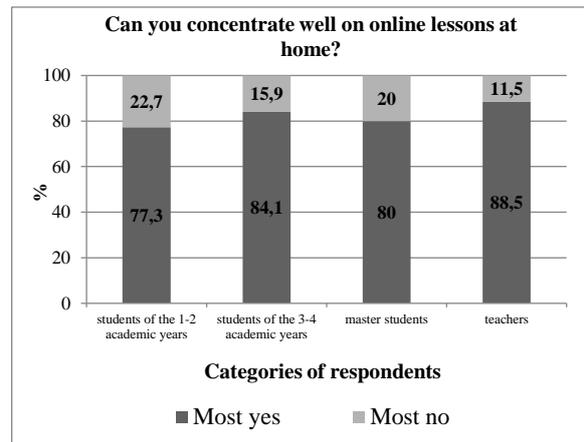

Figure 8 – Opinions of the respondents on the possibility to concentrate on online classes at home
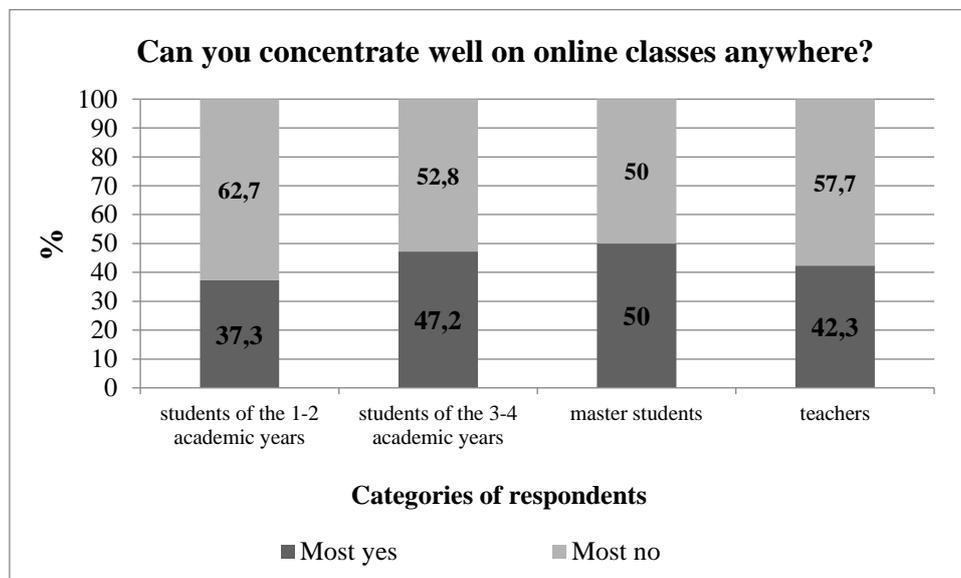

Figure 9 – **Respondents' views on the ability to focus on online classes anywhere**

Source: authors' calculation

According to the results of the polling among students, we see the following trend: up to 60% of students can concentrate well on online classes while at the university (Fig. 7), up to 84% - can concentrate while at home (Fig. 8), up to 50% - while being in any place (fig. 9). Regarding the results of the polling among teachers, we have the following situation: 88.5% of teachers believe that they will be able to concentrate well while conducting online classes at home (Fig. 8); 42.3% - in any place (Fig. 9); and only 20% of lecturers will be able to have sufficient concentration to effectively conduct online classes at the university (Fig. 7).

Analyzing the results of the survey (Fig. 10), we see that 60% of teachers during distance learning conduct online classes at home, 25% - conduct online classes in common areas of the university and only 15% - in private office at the university. Also, according to the results - 90% of students are often at home during distance learning (Fig. 11).

During distance learning, a very effective form of learning is the division of students into groups (subgroups), which allows you to help students to concentrate more effectively on learning the material, as well as pay more attention to each student. During group (mini-group) classes there are more opportunities for the introduction of digital technologies (the use of video clips, interactive technologies, etc.). Group classes allow

_____

_____

students to master the material more effectively and
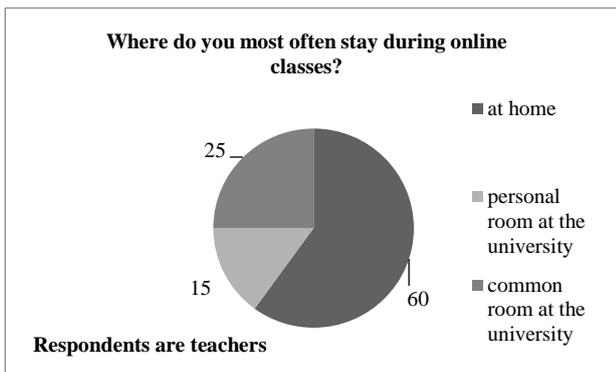
acquire practical skills.

Figure 10 – Opinions of respondents-teachers on the location during online classes
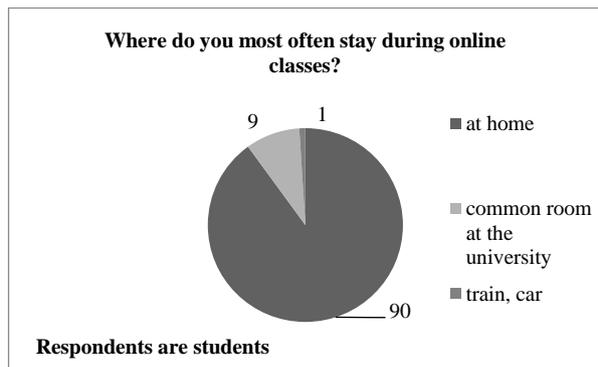

Figure 11 – Opinions of respondents-students on the location during online classes

Source: authors' calculation

During distance learning, a very effective form of learning is the division of students into groups (subgroups), which allows you to help students to concentrate more effectively on learning the material, as well as pay more attention to each student. During group (mini-group) classes there are more opportunities for the introduction of digital technologies (the use of video clips, interactive technologies, etc.). Group classes allow students to master the material more effectively and acquire practical skills.

According to the results of the survey, we have the following opinion of respondents about the need for online classes in group format (Fig. 12):

- among students of 1-2 academic years 38% of students believe that group classes are necessary for the acquisition of knowledge, 30% – that they are not needed and 42% - do not prefer them;

- among students of 3-4 academic years only 26.1% – prefer group work, 37.7% – do not prefer this type of activity, 36.2% - believe that group work is not necessary;

- among graduate students, 30% of students support the opinion that group work is necessary for better learning, but 60% of them – believe that this type of activity is not important for them;

- the majority of teachers (61.5%) are inclined to think that the use of group classes is necessary for better learning.
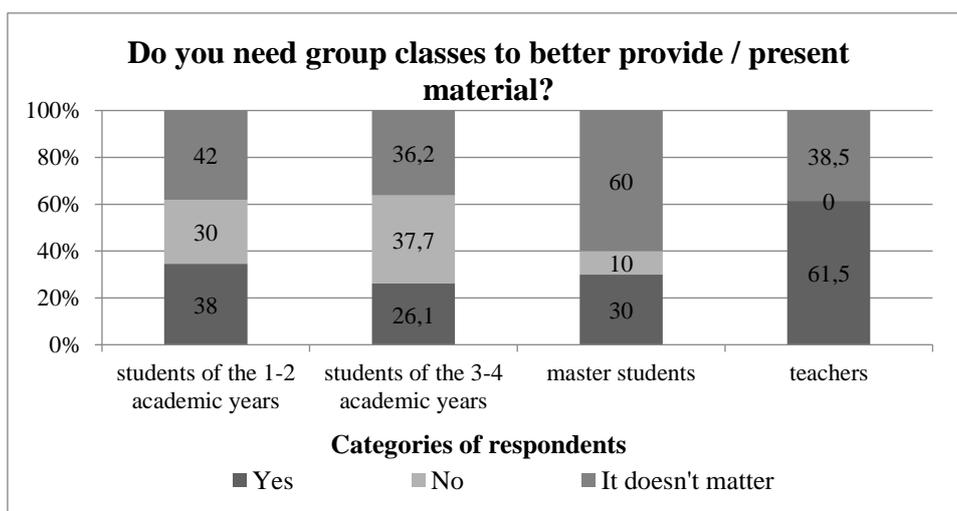

Figure 12 – **Opinions of respondents on the need for online classes in group format**

Source: authors' calculation

The provision of technical means for online classes is an important condition for effective distance learning and an important element in the implementation of digitalization at the university, especially during pandemic that has preconditioned the development of digital education. The

basic technical facilities of online classes include the availability for both students and teachers of computers (laptops), microphones, headphones etc. No less important is the information basis for these technical means, without which it is impossible to apply them [1-2]. In order to

_____

_____

determine the availability for teachers and students of certain types of technical means in the questionnaire were

included questions about the importance of using technical means (Block 3 of the questionnaire – technical facilities).
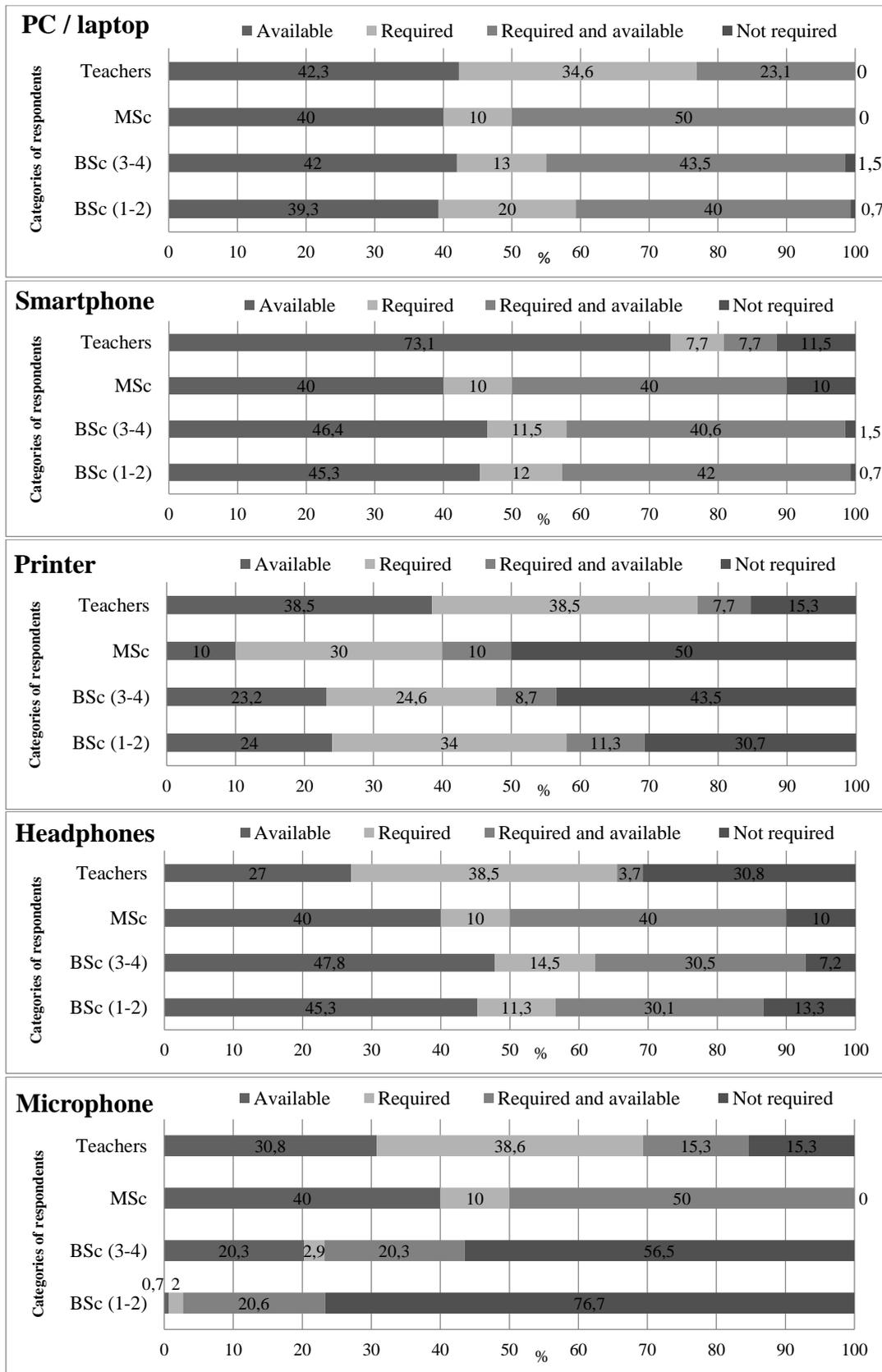

Figure 13 – **Technical preparedness of the respondents**

Source: authors' calculation

_____

_____

Given the results of the study (Fig. 13), we see that up to 42% of respondents are supplied with computers (or laptops); only 34.6% of teachers believe that they are needed for online classes, and from 10 to 20% of students believe that laptops are needed for online classes, but they can be replaced by other technical means such as smartphones. Regarding the use of smartphones in distance education, 11.5% of teachers consider a smartphone as a tool that is unimportant for online classes, i.e. they are not needed. However, up to 42% of students have smartphones and believe that they are needed for online learning (Fig. 13).

The results of the survey on the availability of printers are ambiguous among various categories of respondents (Fig. 13). In particular, only 38.5% of teachers have printers and 23.2% of students have them too. This category of teachers (38.5%) believe that printers are necessary for use in the educational process, while up to 50% of students believe that printers are not necessary. This situation can be logically explained due to the fact that teachers need to have printed materials in order to prepare for lectures and develop laboratory and practical tasks.

It is worth noting that 30.8% of teachers believe that headphones are not needed for distance learning. Up to 13.3% of students have the same opinion, the rest of the students believe that headphones are needed as an auxiliary technical tool for better perception of information (Fig. 13).

There are interesting results on the question of the need to use a microphone in distance learning. Almost 77% students of 1-2 academic years said that they do not need a microphone for online classes, but up to 50% of graduate students said that they have a microphone and it is needed for online learning.

Conclusions. In general, summarizing the results of the research, it should be noted that the introduction of digitalization to the university is an important step towards improvement of distance learning, as it intends to bring digital education in accordance with modern conditions. Given the results, it's obvious that the technical preparedness of teachers and students needs to be improved, which would encourage all participants of the educational process to introduce innovative teaching methods and technologies, such as the production of video lectures. In its turn, this will improve the quality and efficiency of the educational process. In future research, the authors plan to carry out polls on various faculties and compare the results of the implementation of digitalization processes in relation to the specialty that students are mastering.

References:

1. Ghorpynchenko, M. V. (2012). The role of higher education in the information society. *Naukovi praci Kirovoghradsjkogho nacionaljnogho tekhnichnogho universytetu*. *Ekonomichni nauky*. 22. 1. 178-184 [in Ukraine].
2. Pavlova, V. (2017). The role of the university in the modern world. Visnyk of Lviv University. *Visnyk of Lviv University*. Series Pedagogics. 32. 39-45 [in Ukraine].
3. Parpan, U. M. (2021). Informatization - a modern trend in education. *IT parvo : problemy i perspektyvy rozvytku v Ukrajini*. Retrieved from : http://aphd.ua/publication-381/ [in Ukraine].
4. Legal Informatics (2004) : *pidruchnyk* : [u 2 t.]. Kyjiv. 1. 416 [in Ukraine].
5. Arnold, M. G., Vogel, A., & Ulber, M. (2021). Digitalizing Higher Education in Light of Sustainability and Rebound Effects – Surveys in Times of the COVID-19 Pandemic. *Sustainability*, 13, 12912. https://doi.org/10.3390/su132212912 [in English]
6. Goertz, L., & Hense, J. (2021). Digitalizing Higher Education in Light of Sustainability and Rebound Effects - Surveys in Times of the COVID-19 Pandemic. *Hochschulforum Digitalisierung*, Berlin, Germany, 1-51. Retrieved from : https://hochschulforumdigitalisierung.de/sites/default/files/dateien/HFD_AP_56_Support-Strukturen_Lehre_Corona_mmb.pdf [in English]
7. Breitenbach, A. (2021). Digitale Lehre in Zeiten von COVID-19 : Risiken und Chancen. Marburg. 1–19. Retrieved from : http://nbn-resolving.org/urn:nbn:de:0111-pedocs-212740 [in English]
8. Dibrova, A., Kovalenko, N., Kuts, T., & Labenko, O. (2021). Experience of using modern educational methods in learning process of the economics faculty NULES of Ukraine in the implementation of EU ERASMUS + TOPAS in the COVID-19 pandemic. *Development issues of innovative economy in the agricultural sector : International scientific-practical conference*. Tashkent. Uzbekistan. 25-26.03.2021, 339-344 [in English]
9. Tolochko, S. V. (2021). Digital competence of teachers in terms of digitalization of educational institutions and distance learning. *Visnyk Nacionaljnogho universytetu «Chernighivsjkyj koleghium» imeni T.Gh. Shevchenka*. Serija : Pedaghoghichni nauky, 13(169), 28-35 [in Ukraine]
10. Strokal, V. P. & Palamarchuk, S. P. (2016). Basic information and technical means of distance learning. *Naukovyj visnyk Ljvivsjkogho nacionaljnogho universytetu veterynarnoji medycyny ta biotekhnologhij imeni S. Z. Gzhycjkogho*. Serija : Ekonomichni nauky, 18.2, 219-223 [in Ukraine]

_____

_____