ORGANIZATION OF EDUCATIONAL ACTIVITIES IN THE CONTEXT OF BLENDED LEARNING FOR FUTURE TELECOMMUNICATIONS SPECIALISTS

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Summary.

The article is devoted to the issue of organizing educational activities in the conditions of blended learning for future telecommunications specialists in teaching the disciplines "Switching and Information Distribution Systems" and "Telecommunication and Information Networks". Due to the pandemic and the Russian invasion of Ukraine, distance and blended learning has become one of the leading trends in education, providing continuous and high-quality education. The author analyzed the experience of Ukrainian researchers in the use of blended learning and ICT tools in higher education institutions. The author describes digital tools and learning platforms used by teachers in the disciplines "Switching and Information Distribution Systems" and "Telecommunication and Information Networks" at the Kyiv Professional College of Communications. The materials in the areas of study of future telecommunications specialists are described in detail. The advantages of using the workbook in teaching the discipline "Telecommunication and Information Networks" are presented.

As a result of the survey, which was attended by 50 students majoring in Telecommunications and Radio Engineering, the following advantages of blended

learning were identified: flexibility of the process; increased academic performance of students; gaining knowledge in different ways; combination of distance and traditional learning. In an open question, students were asked to indicate what, in their opinion, needs to be changed or improved to improve the blended learning process; the answers were analyzed by the author and singled out into separate positions.

Keywords*: digital tools, blended learning, informatization, students, telecommunications, institutions of professional higher education*

1. Introduction.

The use of blended learning in higher education institutions is a priority not only in Ukraine but also around the world. The impact of the pandemic on educational processes and the outbreak of war in Ukraine in February 2022 have actualized the problems that have arisen in the system of higher education before. Therefore, effective organizational activities of higher education institutions are possible with the high-quality and continuous use of cloud services, digital platforms, auxiliary resources, as well as with the improvement of teachers' competencies in conducting classes for future telecommunications specialists.

2. Analysis of publications and the purpose of the study.

The following scholars have studied the use of digital tools, information and communication technologies for organizing distance and blended learning in educational institutions: N. Hushchyna, O. Spirin, V. Oliynyk, N. Morse, O. Pinchuk, L. Kartashova, O. Pinchuk, M. Silchenko, L. Liakhotska, N. Bolubash, and others. N. Balyk, L. Kartashova, K. Buhaichuk, V. Bykov, N. Morse, V. Oleksiuk, M. Noskova, O. Spirin, M. Shyshkina, and others have been involved in the implementation of Google services in the educational process.

The purpose of the article is to describe the digital platforms and tools used in the educational activities of teachers of the Kyiv Professional College of Communications in the training of students majoring in Telecommunications and

Radio Engineering in the process of blended learning; theoretical justification of the need to use cloud services and auxiliary digital tools for the successful activity of future telecommunications specialists.

Within the framework of the formulated goal, the following research tasks were solved: by surveying future telecommunications specialists, to identify the advantages, features of digital platforms and auxiliary tools used at the Kyiv Professional College of Communications.

3. Digital services in the process of blended learning

Undoubtedly, the process of modernization of the education system in professional higher education institutions is influenced by the informatization of society and is based on dynamism, the use of existing educational technologies, innovative methods, and new forms of education, such as blended and distance learning. In the Ukrainian modern information society, there is a great demand for IT specialists. Therefore, quality education in colleges and higher education institutions is a priority and is of great value in the field of telecommunications and radio engineering.

The development of science and technology has led to a sharp increase in the need for a digital economy and digital society. Thanks to digital technologies, all changes and realities in society are rapidly changing and updating. The modern education system must be constantly updated, adapted, adjusted and improved by scientific knowledge, because the future of Ukraine depends on the activities of experienced professionals trained in the digital world. According to HolonIQ, the main skills in the 2030 learning scenarios are the ability to make decisions and independent judgments, the ability to produce ideas, active learning, and the ability to learn throughout life.

An important component of blended learning is the organization of the educational process in such a way that future telecommunications specialists communicate with each other online, in groups, during discussions, and these classes overlap with, complement, and add meaning to classroom classes. Without

these digital, interactive forms of learning and communication, the process of studying a course at a distance becomes static and ineffective. Therefore, the use of digital tools and cloud technologies is relevant in the process of blended learning: the education and training of teachers should be carried out in accordance with the needs and follow individual and adapted educational trajectories.

The educational process at a distance can be complete if teachers have a number of professional, digital and personal competencies that will allow them to interest, teach, organize the work of future specialists in the first classes and keep their attention until the final one [5].

The author analyzed which digital tools are used by teachers at the Kyiv Professional College of Communication in the process of blended learning:

- Google Apps services. Using Google Forms to conduct various surveys, test the level of knowledge of future telecommunications professionals. Google Forms are used as a test platform that eliminates paperwork, in addition, the test results will not be lost, as they are stored in the Google cloud (Vinokhodov, 2017). Google Class is a digital platform where interaction between a teacher and a student or a teacher and a group of students takes place. The creation of a distance course, class, group on Google Class is driven by the need to find new intensive ways and means of education that is moving to new content, and this, of course, requires the use of modern learning tools. Google Classroom helps teachers to organize interaction through the practical development of various online resources and tasks; to teach how to create and maintain a personal information environment, their own virtual rooms, to demonstrate the benefits of collective interaction, cooperation, and the effectiveness of using Google's

digital tools in educational activities using specific examples (Fig. 1).

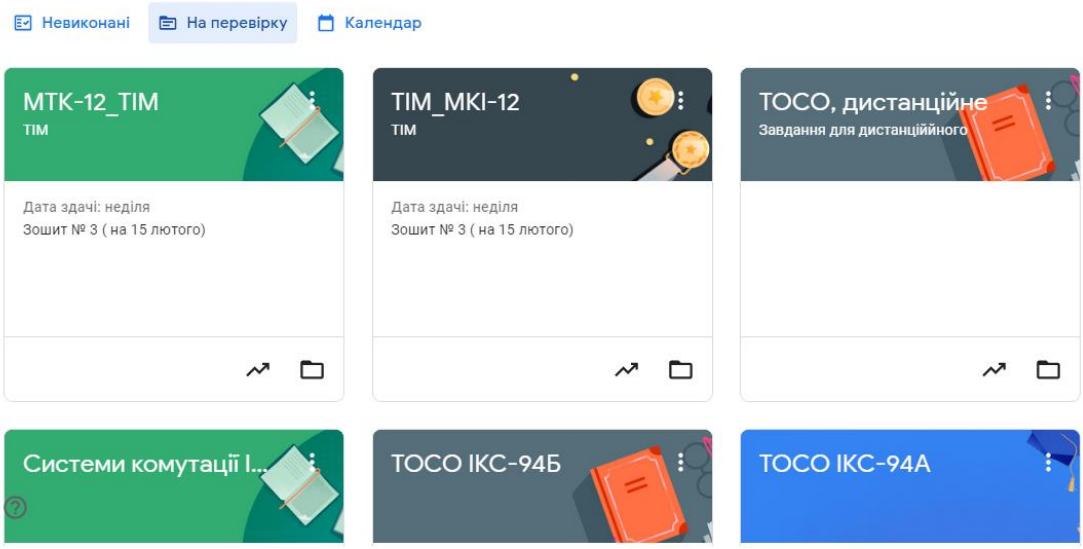


Fig. 1 - Work in Google Classroom by a teacher of the Kyiv Professional College of Communications

The main advantage of working in this digital environment is high-quality feedback from course participants, set up through notification systems, submission of work, and private consultations for each assignment in the Google Classroom system.

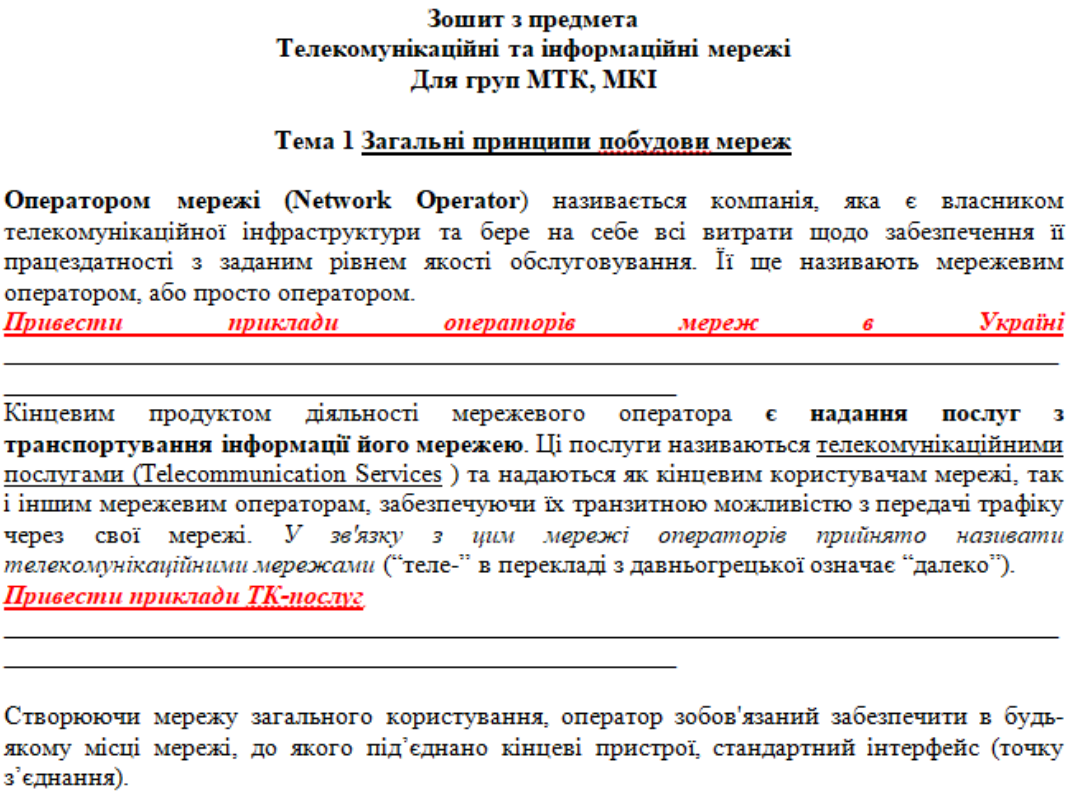
During blended learning, future telecommunications specialists work through materials in the following areas:

- They get acquainted with lectures in the form of documents, audio and video files in Google Classroom virtual rooms in the disciplines of Switching and Information Distribution Systems and Telecommunication and Information Networks.

- Summarize, analyze and systematize lecture materials on the ZOOM platform.

- Use Padlet board on the ZOOM or GOOGLE MEET platforms when conducting lectures in the disciplines "Switching and Information Distribution Systems" and "Telecommunication and Information Networks". In the process, students can supplement the teacher, express their opinions, and draw a diagram in real time.

- During classroom and online classes, workbooks are used to help learn the material, systematize knowledge, supplement and analyze it. In the system of vocational education, workbooks occupy a proper place and play a multifaceted role in improving the effectiveness of learning, provided they are methodically competent in their design and use (Fig. 2). When working in such a notebook, the student needs to add, cross out, complete directly on the pages of the notebook, which is convenient for both classroom and online classes.



Зошит з предмета
Телекомунікаційні та інформаційні мережі
Для груп МТК, МКІ

Тема 1 Загальні принципи побудови мереж

Оператором мережі (Network Operator) називається компанія, яка є власником телекомунікаційної інфраструктури та бере на себе всі витрати щодо забезпечення її працездатності з заданим рівнем якості обслуговування. Її ще називають мережевим оператором, або просто оператором.

Привести приклади операторів мереж в Україні

Кінцевим продуктом діяльності мережевого оператора **є надання послуг з транспортування інформації його мережею**. Ці послуги називаються телекомунікаційними послугами (Telecommunication Services) та надаються як кінцевим користувачам мережі, так і іншим мережевим операторам, забезпечуючи їх транзитною можливістю з передачі трафіку через свої мережі. *У зв'язку з цим мережі операторів прийнято називати телекомунікаційними мережами* ("теле-" в перекладі з давньогрецької означає "далеко").

Привести приклади ТК-послуг

Створюючи мережу загального користування, оператор зобов'язаний забезпечити в будь-якому місці мережі, до якого під'єднано кінцеві пристрої, стандартний інтерфейс (точку з'єднання).

Fig.2 - An example of using a notebook in teaching the discipline "Telecommunication and Information Networks"

4. Conducting a survey among students

The authors conducted a survey among 50 future telecommunications specialists at the Kyiv Professional College of Communication, which included questions about the effectiveness of blended learning: how students perceive blended learning; what advantages they see in blended learning when studying the

discipline "Switching and Information Distribution Systems" and "Telecommunication and Information Networks"; what resources are considered more effective in the process of blended learning.

The answers were distributed as follows:

1. What resources are most convenient and effective for you to use in the process of blended learning? (Google Meet - convenient - 69%, not very convenient application - 7%, not used by the teacher - 24%; Zoom - convenient - 86%, not very convenient application - 6%, not used by the teacher - 8%; Google Class - convenient - 92%, not very convenient application - 4%, not used by the teacher - 4%).

2. The advantages of blended learning are shown in Figure 3, where the percentage of factors that students considered to be the greatest advantages are included (Fig. 3).

Fig. 3 - Answers of students about the benefits of blended learning

The author notes that most of all, students majoring in Telecommunications and Radio Engineering highlighted the following advantages: flexibility of the process (58%); improving students' academic performance (56%); gaining knowledge in different ways (45%); and combining distance and traditional learning (64%). In an open-ended question, students were asked to indicate what, in their opinion, needs to be changed or improved to improve the process of blended learning:

- A personalized, adaptive approach to the student through individual assignments.

- Real-time communication through various digital tools and platforms.

- Diversify classes with various simulation programs. Interactive programs and new effective methods.

5. Conclusions

The prospect of improving blended learning in the process of training future telecommunications specialists is the active introduction of digital platforms and cloud services into the educational process, as well as the improvement and active use of digital competencies by teachers. Organizing effective blended learning with the use of digital platforms, workbooks, simulation programs, and visualization programs is important for students majoring in Telecommunications and Radio Engineering, as communicating with students at a distance, inspiring and motivating them to study in their specialty are skills that modern teachers must have. After analyzing the survey, the author can state that the active role of cloud services, digital platforms and auxiliary tools (e.g., workbooks) in the process of blended learning allows to improve the professional competencies of students, effectively learn knowledge in the study of the disciplines "Switching and Information Distribution Systems" and "Telecommunication and Information Networks". The introduction of computer technology and simulation programs in the process of training a future telecommunications specialist in higher education institutions radically changes the content of training and the role of the teacher in the educational process. The most interesting and effective, in the author's opinion, is the learning process where technical teaching aids are used to demonstrate the processes that occur in telecommunications visually.

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