Modern trends of communications in higher education: problems and prospects

Roman Peleshchak†, Andrii Khudyi†, Ihor Matviy†, Roman Miroshnyk∗,†, Iryna Bahlai† and Lina Halaz†

Lviv Polytechnic National University, Stepan Bandera str, 12, Lviv, 79013, Ukraine

Abstract

An overview of modern trends and problems of communications in higher education was conducted. A model of the system of communication tools of universities with participants in educational processes was formed, depending on the purpose of communications. The participants of the communication process between the university and stakeholders (interested persons) have been identified. Four basic university communication tools are defined: online learning platforms; official websites and corporate mail of universities; messengers and social networks. The trends in the number of users of popular social networks, messengers and online platforms for learning are considered. It is proposed for universities to use social networks and messengers for different target groups. Formed functions of the communication system between universities and stakeholders (interested persons). Trends in the change of users of social networks and messengers in the world are predicted. Recommendations for further activation of university communications with stakeholders (interested persons) have been developed.

Keywords

education, university, communication, students, teachers, applicants, messengers, social networks, online learning platforms, official websites, corporate mail

1. Introduction

In the modern conditions of globalization, informatization and rapid development of technologies, scientific communication becomes a key component of the successful activity of a higher education institution of any form of ownership or scientific team. Changes in the modern world determine both the forms and means of scientific communication. Traditional methods such as face-to-face meetings, publications, conferences and correspondence remain relevant, but along with them new practices based on information and communication technologies are emerging. Online learning platforms, social networks, and other digital tools open up new opportunities for the exchange of ideas and collaboration between scientists around the

world. They help increase the availability of scientific information and increase its impact on society.

The development of information technologies and the emergence of new means of communication expand the possibilities of scientific research and contribute to the rapid dissemination of information. However, the scientific community also faces challenges such as information noise, fake news and information overload. That is, along with the advantages there are also challenges. For example, it is necessary to resolve issues regarding the quality and reliability of information published on the Internet. It is also important to ensure openness and transparency in scientific research to increase public trust in scientific knowledge.

Therefore, the development of scientific communication in the modern world requires innovative approaches and constant adaptation to changes in the technological and social environment. Only in this way will the scientific community be able to effectively influence social processes and contribute to scientific progress.

From a sociological point of view, communications in the scientific environment represent a complex system of social interactions aimed at the acquisition, accumulation and dissemination of scientific knowledge. This system uses various channels, means and tools of communication to achieve its goals.

As the world is changing rapidly, new forms of communication and strategies are becoming increasingly important for the scientific community and higher education institutions. Therefore, it is important that research teams learn and master new methods of communication, such as online conferences and social networks, which open up new opportunities for communication and collaboration.

Current trends in communications in higher education reflect rapid and significant changes in the ways universities, students, faculty, and other stakeholders interact. Digital communications in the form of the Internet and social networks are becoming the main channels of communication in higher education. Universities are actively using websites, emails, blogs and social media to communicate with students, promote events and communicate important information. With the development of technology, the format of online courses and webinars is becoming increasingly popular, allowing students to access quality education regardless of their place of residence and schedule. Universities are improving their communication strategies, placing greater emphasis on the individual needs and interests of students. This includes personalized messages, advice and support. The growing international mobility of students and teachers leads to more active intercultural communication. Universities focus their efforts on creating international exchange programs, cross-cultural events and other initiatives to promote mutual understanding and cooperation.

Modern universities place more emphasis on interaction and cooperation between students and teachers. This includes joint projects, student organizations, forums and other initiatives that increase student participation in university life. Constant updating of its technical means and information systems helps ensure effective communication and convenient access to resources for all participants in the educational process.

These trends indicate the constant development of the communication environment in universities and emphasize the importance of effective communication for achieving success in higher education.

The purpose of the article is to highlight modern trends in scientific communication in institutions of higher education and to study how scientific teams of higher education, the student community and external entities perceive them. This is important in order to understand how to improve the communication system in the university environment and ensure effective interaction between all participants of the scientific process.

2. Related works

Problems of communication in institutions of higher education are devoted to the work of both Ukrainian and foreign scientists. Research conducted by domestic scientists A.O.

Lytvynchuk, G.M. Tereshchenko, S.L. Londar, M.O. Horna are devoted to the use of information and communication technologies (ICT) in education. These studies consider ICT as a key tool for achieving the Sustainable Development Goals defined in the UN General Assembly Resolution "Transforming our world: the 2030 agenda for sustainable development".

One of these goals is to ensure quality education and stimulate learning opportunities throughout life, ensuring the educational process covers all those who wish. ICT, as emphasized by S.L. Lodnar, A.O. Lytvynchuk and G.M. Tereshchenko, play a key role in ensuring access to education, in particular for pupils and students with special needs [1, 2].

The use of ICT in educational institutions makes it possible to create accessible and adaptive learning environments that take into account the individual needs of each student. This means that e-learning tools can be customized for different types and levels of disabilities to provide comprehensive access to knowledge.

In addition, ICT can make the learning process more interesting and engaging, thanks to visualization of material, interactive exercises and opportunities for communication and collaboration. This contributes not only to the assimilation of knowledge, but also to the development of creativity, critical thinking and other key skills. Thus, the use of ICT in education not only meets the requirements of modern times, but is also a necessary step in the implementation of global efforts to ensure quality education and the implementation of the principles of sustainable development for all population groups.

In his work, the author Zharska I.O. focuses on such issues as the influence of the Internet on marketing communications of universities with applicants, the basic principles of organizing marketing communications in the digital environment, the use of Internet marketing tools to attract the attention of applicants. Approaches to determining the strategy of interacting with the audience on the Internet are interesting: personalization, interactivity, content marketing, and determining trends in the development of higher education marketing in the online environment [4].

Kisyolek A., Bondarenko Yu., and Ohinok, S. in their article analyze the popularity of Ukrainian institutions of higher education in the online environment [5]. A set of factors that influence the popularity of these institutions are studied, namely: the level of online presence, activity in social networks, ratings in the relevant rating systems, as well as feedback and user reviews are determined. This comprehensive approach allows you to get a more complete picture of the status and reputation of each institution among the virtual community.

The conducted research is extremely useful for potential students and applicants, as it provides an opportunity to objectively assess the attractiveness of each university based on its online presence and overall impression of it on the Internet. This allows prospective students to make an informed choice about the educational institution that best meets their needs and expectations.

In addition, the analysis of the popularity of Ukrainian universities in the online environment can be useful for managers in the field of education. It allows us to understand exactly how higher education institutions are perceived by the public and how their reputation affects the demand for educational programs and the overall competitiveness of universities. This, in turn, may indicate the need and directions for improving communication strategies to promote the institution and increase its attractiveness for students and researchers.

Worthy of attention is the study of the use of Internet marketing communication tools by higher educational institutions authored by Kisiołek A., Karyy O. and Halkiv L., which analyzes the tools used by higher educational institutions to provide marketing communication via the Internet. The study focuses on a comparative analysis between the use of Internet marketing tools in Poland and Ukraine, which makes it possible to find out similar and different approaches in both countries. Focuses on how higher education institutions use Internet marketing tools to increase their appeal to prospective students and other target audiences [6].

An important tool of the communication process is the use of online learning platforms such as Google Classroom, Microsoft Teams, Zoom and Moodle. The team of authors [7, 8] in their work substantiates the prerequisites for the transition to distance education in conditions of instability and the presence of threatening factors, considers the features of the most popular

online platforms for learning, compares the services offered to users of educational platforms. The considered toolkit is able to significantly influence the construction of communication chains between the university and other subjects.

The use of digital technologies for the communication process in institutions of higher education is a direction of scientific research to which foreign scientists pay attention. In particular, R. Saxena, P.P. Kaur, A. Saxena emphasize that due to the widespread use of information technology in various countries, it is the best time to innovate new ideas on digital platforms for education [9]. The article presents various tools and techniques for providing quality education during remote work through digital media. These platforms can definitely be used for the communication process at different levels.

In turn, M. Entradas, M. Bauer, F. Marcinkowski and J. Pellegrini offer a view on the emergence of the practice of managing external relations of a modern university and the role of scientific communication in this process. With the help of a representative sample of research universities in four countries, an attempt is made to broaden the understanding of the function of scientific communication and its niche in the modern university. Scholars separate scholarly communication from corporate communication functions and examine how they are distributed at different levels of the organization. Communication functions, according to scientists, can be represented along the spectrum of decentralization: activities in the field of public relations and marketing are more likely to be performed at the central level (central offices), and affairs in the field of public relations and on are carried out at decentralized levels (for example, in specific offices and/or scientific institutes, departments). This study shows that scholarly communication is under-emphasized in central structures, suggesting that it is not a practice that easily aligns with university corporate communication, but that scholarly communication may increasingly find its niche in decentralized settings [10].

Summarizing the analysis of scientific works [3, 11, 12, 13], it can be concluded that the ways of communication development in higher educational institutions, taking into account the characteristics of consumers of educational services, the specifics of the activities of educational institutions and the means of information transmission used by them, are insufficiently covered. This makes it necessary to conduct additional research in this direction. The effective operation of higher educational institutions largely depends on the professionalism of specialists in the field of communications. In modern conditions, when the market of educational services is in a state of instability and high competition, their work becomes critically important. Therefore the study of the role of communications in the functioning of higher education, as well as the problems and prospects of their development, is an urgent and necessary task.

The main goal of this study is the theoretical justification and development of practical recommendations for the formation of an effective communication strategy for higher educational institutions. In particular, the study of this topic involves the use of an integrated approach to the transfer of information to potential users of educational services through online learning platforms, official websites and university corporate mail, messengers and social networks.

This study focuses on the need to pay attention to various aspects of communication processes in the university environment, including internal and external communication, interaction with students, teachers, administrative staff, as well as work with the public and the development of an online presence. It is important to note that this study aims not only at theoretical conceptualization, but also at the development of practical tools and recommendations that will help higher education institutions improve their communication strategy and increase the effectiveness of interaction with their audiences.

3. Methods

To conduct a study of the peculiarities of communication between universities and participants in the educational process, the authors recommend using a methodology that

involves the selection of communication tools depending on the goal that the university sets for communication, as well as depending on the category of stakeholders with whom communication is planned.

The authors recommend highlighting three goals that the university sets for itself when communicating with participants in the educational process. The choice of the communication channel depends on the purpose of the universities' communication with stakeholders (interested parties), which allows us to distinguish the following three purposes:

• Informative goal – to provide comprehensive information on organizational issues, educational processes, educational projects, class schedule, admission conditions, list of specialties;

• Educational goal – the use of modern information and communication technologies directly during the educational process (learning), online educational platforms, corporate mail, various services, etc.;

• Image goal – formation of a positive and successful brand of universities, positive business reputation, successful image, recognition and popularity of universities in the market of educational services.

Depending on the type of goal that the university sets for itself in communications, it is recommended to choose an appropriate group of communication tools. For this, the authors proposed a model of the system of communication tools of universities with participants in educational processes depending on the purpose of communications (Figure 1).
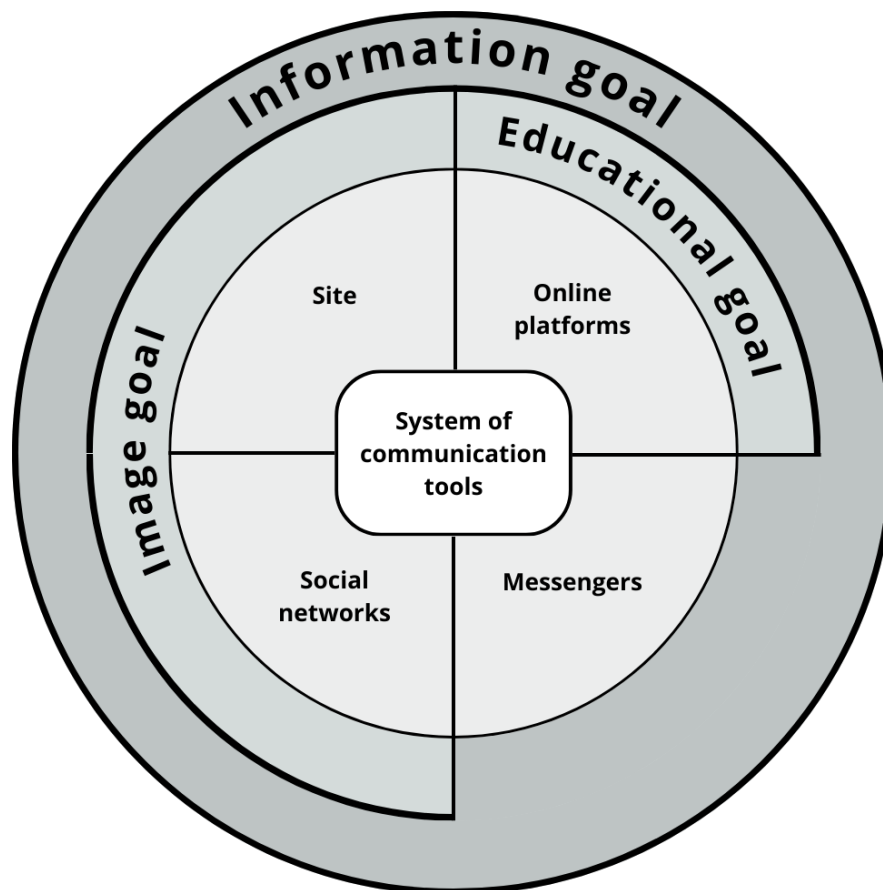

Figure 1: Model of the system of communication tools of universities with stakeholders depending on the purpose of communication

From Figure 1, it can be seen that the system of communication tools of the university has three goals, which were described above. Also, the system of communication tools of the

university includes: corporate websites and e-mails, online platforms, social networks and messengers.

In order to build the brand of the university as the best educational institution with a high level of training of specialists, we recommend using the website and social networks. Here, participants of the educational process will be able to get an idea of what is happening at the university, read student reviews, view events (scientific, sports, educational, entertainment) taking place at the educational institution, etc.

Social networks allow you to demonstrate the general atmosphere that prevails within the walls of the university, to show all the advantages and prestige of being one of the members of the community of this educational institution.

Correlation-regression analysis, which is the construction and analysis of an economic-mathematical model in the form of a regression equation (correlation equation), will be used to establish the dependence of the resulting characteristic on one or more characteristic-factors characterizing the object of research. The use of correlation-regression analysis provides the possibility of describing this dependence between the resulting feature and the feature-factor with the help of mathematical tools, forecasting future results and evaluating the degree of density of the connection between the features. The use of a graphic method provided visualization and a compact presentation of the results of the correlation-regression analysis.

4. Experment

The study of the current state of the communication policy of universities in the world and in Ukraine requires the identification of trends and the main directions of the development of information processes. This requires focusing attention on the interested persons, the purpose of the communication policy of the universities and the tools for communication with the surrounding environment.

It is extremely important for universities to establish an effective communication process between all stakeholders (interested parties) of the educational process, which include the following groups:
- Students studying directly at universities;
- Teachers (employees of universities) who directly carry out teaching, educational and scientific activities;
- Applicants – potential university entrants who are looking for a future profession and educational institution;
- Partners and other universities cooperating in scientific, educational, research or technical activities;
- Employers – enterprises and organizations searching for ready specialists among university students;
- State authorities and local self-government that directly or indirectly influence and regulate the activities of universities in educational and scientific activities;
- Public and charitable organizations that carry out various social activities and projects.

In order to establish an effective communication process of universities with all stakeholders, a variety of tools are used. It should be noted that the variety of communication tools is influenced by modern scientific and technical progress, which allows creating new information programs and devices, new networks and algorithms for working with information. For the convenience of studying their use, the authors consider it appropriate to divide communication tools into 4 groups: online learning platforms; official websites and corporate mail of universities; messengers; social networks.

Let's consider each of the groups of communication tools in more detail.

Online learning platforms have become more popular in recent years, which is due to both the COVID-19 pandemic and the transition of universities and educational institutions to distance education. This became an impetus for developers to create new platforms for learning and improve existing online services.The following platforms for distance learning are popular in the world: Microsoft Teams, Coursera, Udemy, Teachable, udemy, SkillShare, Moodle and a number of others

[14, 16, 17]. The number of users of the most popular online learning platforms is presented in Table 1.

Table 1
The number of users of online learning platform in the world, millions

Years	Microsoft Teams	Coursera	Udemy
2018	8,0	35,0	38,0
2019	20,0	44,0	40,0
2020	75,0	71,0	44,0
2021	145,0	92,0	49,0
2022	270,0	118,0	52,0
2023	300,0	129,0	69,0

Source: developed by the authors based on [14, 16, 17]

As can be seen from Table 1, the online learning platform Microsoft Teams had only 8,0 million users worldwide in 2018 and 300,0 million users in 2023. The online educational platform Coursera had only 35,0 million users in 2018, but in 2023 the number of users increased to 129,0 million users. The online educational platform Udemy had 38,0 million users in 2018 and 69,0 million users in 2023.

Separately, we can single out the Zoom Conference service, which, although it is not a classic online educational platform, allows you to conduct video classes, communicate between participants, and send materials. Zoom Conference became popular during the COVID-19 pandemic, showing significant growth in both the number of new users and the market value of this service.

The next communication tools for universities are official websites and e-mails (Email). On these resources, universities post information about the history and achievements of the educational institution, current specialties and educational courses, news and events, class schedules for students and teachers, and other important information. With the help of corporate mail, universities communicate with stakeholders (interested persons). It should be noted that corporate websites and e-mails (Email) are the first and oldest inventions in the system of information resources.

Messengers are the next communication tools used by universities. Messengers are programs and applications that allow you to exchange messages using the Internet. The variety of messengers is growing, and so are their options and additional features. Modern messengers include: Facebook Messenger, WhatsApp, Viber, Telegram, Snapchat, Discord, Signal, Skype, iMessage, Dust, GoogleChat. The growth in the number of messenger users for 2018-2023 is shown in Table 2.

Table 2
Number of messenger users in world, millions

Years	Facebook Messenger	Telegram	Viber	WhatsApp	Skype	SnapChat
2018	126,0	200,0	1074,0	1560,0	1430,0	188,0
2019	130,0	300,0	1150,0	1813,0	1550,0	203,0
2020	133,0	400,0	1169,0	2102,0	1670,0	238,0
2021	136,0	500,0	1200,0	2289,0	1800,0	293,0
2022	138,0	731,0	1300,0	2413,0	1950,0	347,0
2023	141,0	1068,0	1350,0	2482,0	2011,0	397,0

Source: developed by the authors based on [15, 18]

It can be seen from Table 2 that the most popular messenger in the world in 2023 was WhatsApp with the number of users of 2482,0 million users. WhatsApp has been growing steadily since 2018, when it had 1560,0 million users. In second place is the Skype messenger, which started its activity back in 2004. If in 2018 Skype had 1430,0 million users, then in 2023 – 2011,0 million users. In third

place was the Viber messenger, which had 1074,0 million users in 2018, and 1350,0 million users in 2023. The Telegram messenger shows high dynamics of growth – if in 2018 it was used by 200.0 million users worldwide, then in 2023 this number increased to 1068,0 million users. The SnapChat messenger shows growth dynamics from 188,0 million users in 2018 to 397,0 million users in 2023.

The last communication tool of universities with stakeholders (interested persons) is social networks. Social networks have been actively developing in recent years, allowing users to communicate, share information, observe trends, and more. Information on the number of users of the most popular social networks in the world is presented in Table 3.

It can be seen from Table 2 that the most popular messenger in the world in 2023 was WhatsApp with the number of users of 2482,0 million users. WhatsApp has been growing steadily since 2018, when it had 1560,0 million users.In second place is the Skype messenger, which started its activity back in 2004. If in 2018 Skype had 1430,0 million users, then in 2023 – 2011,0 million users. In third place was the Viber messenger, which had 1074,0 million users in 2018, and 1350,0 million users in 2023. The Telegram messenger shows high dynamics of growth – if in 2018 it was used by 200.0 million users worldwide, then in 2023 this number increased to 1068,0 million users. The SnapChat messenger shows growth dynamics from 188,0 million users in 2018 to 397,0 million users in 2023.

The last communication tool of universities with stakeholders (interested persons) is social networks. Social networks have been actively developing in recent years, allowing users to communicate, share information, observe trends, and more. Information on the number of users of the most popular social networks in the world is presented in Table 3.

Table 3
The number of users of social networks in the world, millions

Years	Facebook	Instagram	LinkedIn	Youtube	Networks X (formely Twitter)	TikTok
2018	2320,0	1000,0	556,0	1800,0	298,0	133,0
2019	2500,0	1210,0	604,0	2000,0	312,0	381,0
2020	2800,0	1520,0	690,0	2300,0	347,0	700,0
2021	2910,0	1890,0	756,0	2500,0	362,0	902,0
2022	2960,0	2270,0	830,0	2600,0	401,0	1366,0
2023	3050,0	2385,0	930,0	2680,0	540,0	1587,0

Source: developed by the authors based on [15, 18]

From Table 3, we can see that the most popular social network in the world remains Facebook with 3050,0 million users in the world, while in 2018 the number of users of this network was 2320,0 million. Almost all companies, government institutions, charities, famous celebrities have pages on this social network. Educational institutions, including universities, are no exception. Using Facebook, universities can post up-to-date information about their activities, share photos and videos from the educational process, results of conferences and seminars, meetings with famous personalities, etc.

Youtube is the second most popular network in the world with 2680,0 million users in 2023. The YouTube social network allows you to upload videos, comment on them, and from 2020 upload short videos up to 60 seconds. Many universities, university departments or teachers have YouTube channels that allow you to show lecture materials.

In third place is the social network Instagram with 2385,0 million users in the world in 2023. This network showed a growth of almost 1,5 times compared to 2018, when 1000.0 million users were registered. The growth of this network can be explained by its popularity among young people who actively use this service. Instagram is popular among students, schoolchildren and applicants. Many companies and universities create and maintain accounts on this network.

The Chinese social network TikTok is increasing in popularity. If in 2018 this network had 133,0 million users worldwide, then in 2023 the number of users increased to 1366,0 million users. TikTok is very popular among the younger category of users – students, schoolchildren, applicants. This service allows you to create short videos and upload them to the network. Users can share videos,

comment on videos, like, save videos, and more. This resource is actively used by commercial companies to advertise their services and products. In recent years, universities, individual divisions of universities, and individual teachers have been creating accounts on the TikTok network to share information about educational courses, scientific achievements, and innovations in education.

In 2018, the LinkedIn social network had 556,0 million users. In 2023, there were 930,0 million LinkedIn users worldwide. This network allows users to share their business contacts, publish their resume, highlight their professional achievements, develop their career. The LinkedIn network is used by companies (employers), state authorities, and universities.

Network X (formely Twitter), unfortunately, is the least popular in the world, in particular in 2018 there were 298,0 million users worldwide. In 2023, the number of users of the X network (formely Twitter) increased to 540,0 million users worldwide. The X Network (formely Twitter) is a microblogging network that allows you to create and send short text messages between users. The X network (formely Twitter) is popular in the USA, official pages in this network have both public authorities, companies and universities.

5. Results

Studies of university communications with stakeholders make it possible to highlight the main trends in modern conditions. In recent years, the number of users of social networks has been actively growing (Table 1). Social networks plays a very important role in modern economic, political, cultural, scientific and other spheres of human life. Social networks not only increase the number of their followers around the world, but also improve their functionality. Users can better use social networks to spread information, communicate, advertise their activities, create new content, etc.

The popularity of messengers in the world is also growing (Table 2). Developers of messengers improve the functional properties of these programs and applications. This contributes to better communication between participants in the communication process (for example, the university and students).

In recent years, there has been an active development of online platforms for learning (Table 3). The impetus for this was the COVID-19 pandemic in 2020 and the transition of educational institutions to distance education. Online learning platforms are very diverse and have different emphases. In particular, some online platforms can be focused on posting lecture materials and practical classes for students, others on video lectures and communication between teachers and students.

Taking into account six groups of stakeholders (interested parties) and existing popular social networks and messengers, the authors recommended universities to use these communication tools in the following way (Table 4).

Table 4
Recommended social networks and messengers for universities to communicate with stakeholders (interested parties)

Stakeholders (interested parties)	Recommended social networks	Recommended messengers
Students	Instagram, TikTok, Youtube	Telegram, Viber, WhatsApp
Teachers (employees of universities)	LinkedIn, Facebook, Youtube	Viber, WhatsApp, Facebook Messenger
Applicants	Instagram, TikTok, Youtube	Telegram, Viber, WhatsApp
Partners and other universities	LinkedIn, Facebook, Youtube	Viber, WhatsApp, Facebook Messenger
Employers	LinkedIn, Facebook, Youtube	Viber, WhatsApp, Facebook Messenger

State authorities and local self-government	Facebook, LinkedIn, Youtube	Facebook Messenger, Viber, WhatsApp
Public and charitable organizations	Facebook, LinkedIn, Youtube	Facebook Messenger, Telegram, Viber

So, from Table 4, you can see that it is advisable to communicate with such groups of stakeholders as "students" and "applicants" of the university through social networks Instagram, TikTok, Youtube and use Telegram, Viber, WhatsApp messengers.

For the group of stakeholders "teachers" and "partners and other universities" of the university, it is recommended to use social networks LinkedIn, Facebook, Youtube and messengers Viber, WhatsApp, Facebook Messenger.

For the group of stakeholders "state authorities and local self-government" of the university, it is advisable to use social networks Facebook, LinkedIn, Youtube and messengers Facebook Messenger, Viber, WhatsApp.

For the group of stakeholders "public and charitable organizations" of the university, it is advisable to use social networks Facebook, LinkedIn, Youtube and messengers Facebook Messenger, Telegram, Viber.

Using the proposed model (Figure 1), as well as three groups of goals (educational, image, informational), the functions of the university's communication system for communicating with stakeholders (interested parties) are highlighted and proposed (Table 5). These functions are recommended for three main stakeholder groups: students, faculty, and applicants. These three groups are the main communicators in the process of education, scientific research, implementation of various projects, etc.

Table 5
Recommended functions of the university communication system for communication with stakeholders (interested parties)

Stakeholders (interested parties)	Recommended functions		
	Educational	Image	Information
Students	Conducting classes, lectures, seminars, exams, defense of scientific projects, obtaining educational materials	A feeling of involvement and belonging to the scientific community (student environment), which you want to brag about and which causes a high level of satisfaction to be one of the "chosen ones"	Information about schedules of the educational process, conducting classes, news, announcements about future scientific events (competitions, conferences, olympiads), etc.
Teachers	Professional development, exchange of experience and skills at open classes	Formation of loyalty and dedication of teachers (employees) to universities (employers)	Informing about organizational points of work, schedules of the educational process, orders, orders of the university management, document management, informing about scientific events
Applicants	Courses of preparation for admission, familiarization with the activities of educational	The formation and desire to become one of the students, the formation of the image and prestige of being a student of this university	Information about the features of the admissions campaign, rating lists, required documents, events taking place at the university, availability of campuses,

	institutions		features of educational programs, etc.

The use and strengthening of the recommended functions of the communication system will allow to strengthen the competitive advantages of universities, to form a recognizable brand of the educational institution, to improve the business image, to increase the efficiency of the educational and training process, to use all the advantages of modern information technologies. In general, universities will be able to attract talented students and teachers, implement grants and research projects, improve their financial situation and material and technical base.

Based on statistical data on the number of users of educational online platforms, namely: Microsoft Teams, Coursera, Udemy (Table 1), will present the general trend of their change for the period 2018-2023 (Figure 2).
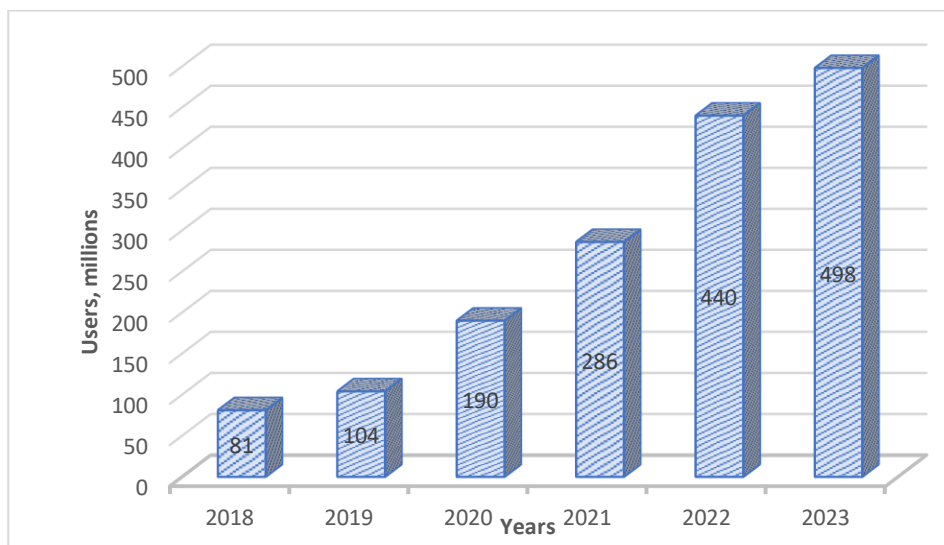

Figure 2: The trend of changing the number of users of online learning platforms

As can be seen from the Figure 2, the trend of change in the number of users of educational online platforms has an upward trend over the studied period. Also, a similar trend is observed for each online educational platform in particular. It is also worth noting that this trend is described by a trend line which is straight (Figure 3).
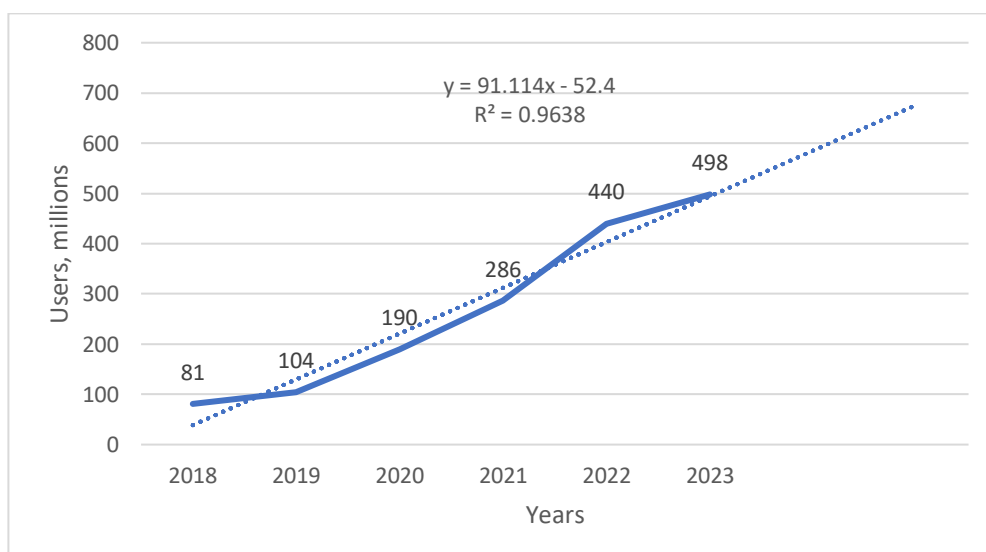
Figure 3: The trend line of changes on the number of users of educational online platforms

Taking into account the equation of the trend line and the value of the correlation coefficient, which is close to 1, it is possible to predict the number of users in the near future. Thus, in 2024, the forecast value of the number of users of educational online platforms will be 585 million users, in 2025 – 676 million users.

The number of messenger users (Table 2) also has a tendency to increase during the studied period (Figure 4).
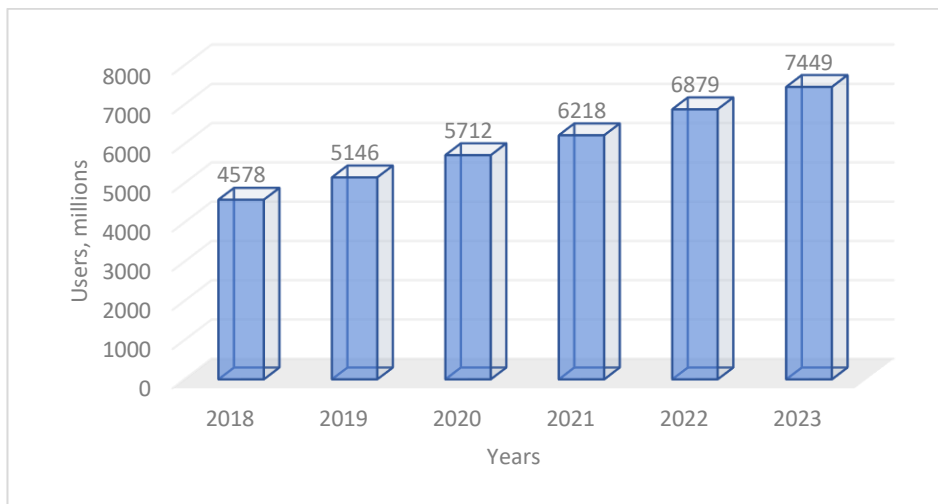

Figure 4: Chanding the number of messenger users

The trend of change in the number of messenger users is described by a trend line, which is given by a linear function and a value of the correlation coefficient close to 1 (Figure 5).
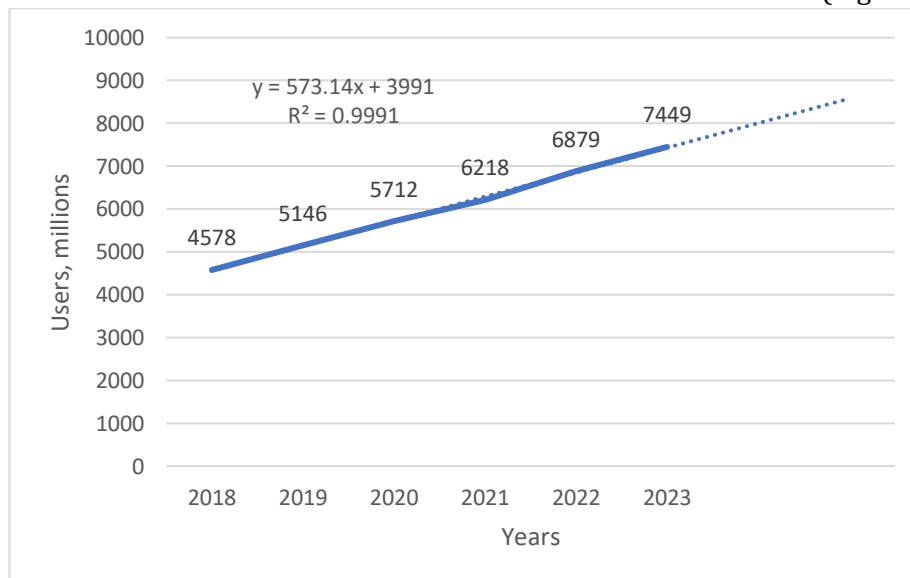

Figure 5: Changing the number of messenger users

The forecast value of the number of messenger users in 2024 and 2025 will be 8003,0 and 8576,0 million users respectively.

The number of users of social networks during the studied period (Table 3) also has an increasing tendency (Figure 6).
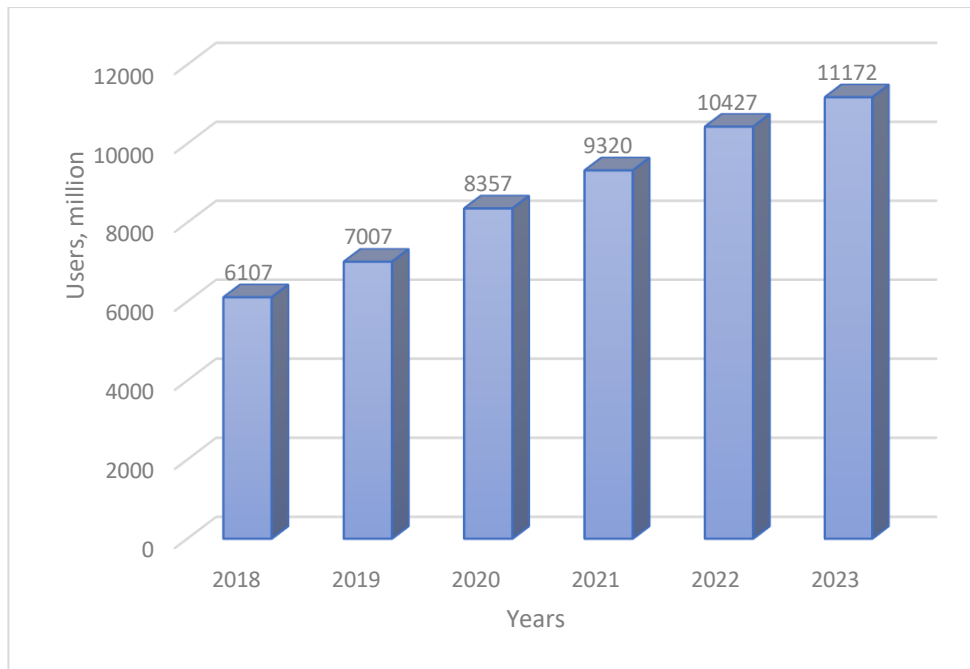
Figure 6: Change in the number of users f social networks

The change in the number of users of social networks is described by a trend line, which is given by a linear function and a value of the correlation coefficient close to 1 (Figure 7).
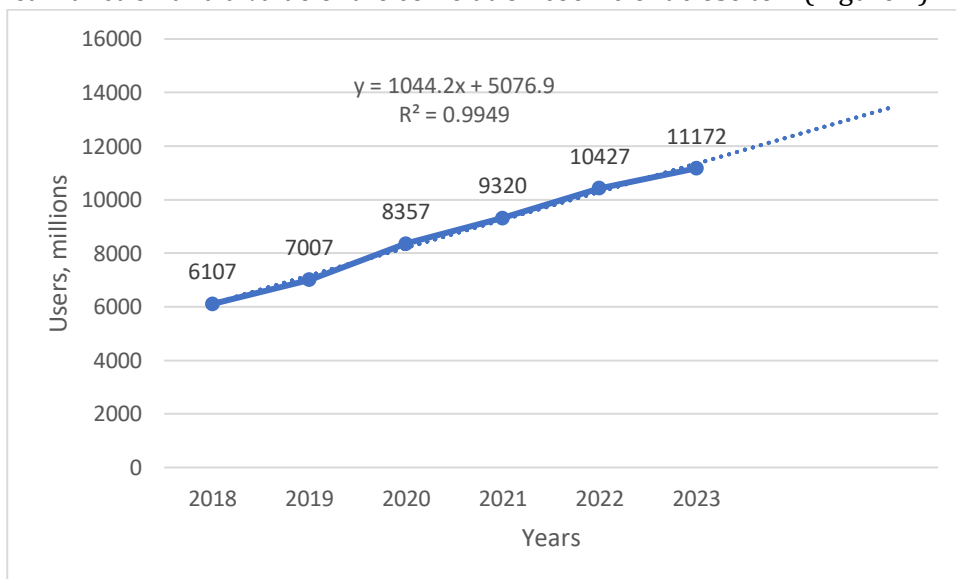

Figure 7: The trend line of changes on the number of users of social networks

The forecast value of the number of social network users in 2024 will be 12386,0 million users, and in 2025 – 13430,0 million users.

The conducted research shows that social networks have the largest annual increase in the number of users, and online educational platforms have the smallest.

6. Discussions

In the modern conditions of the development of the economy and society, the role of information technologies and communication processes (public administration, business,

education) is increasingly growing. The growing role of information in society is felt very significantly: the use of special applications and services allows shopping, training, and customer service without leaving home.

The invention of new technologies allows developers to create new social networks and messengers, online platforms for learning, improve existing gadgets (add new functions and capabilities, improve the process of communication and information exchange). This process intensified with the onset of the COVID-19 pandemic and the introduction of quarantine measures in most countries of the world. State institutions, banks, manufacturing enterprises, as well as educational institutions were forced to either partially stop work or switch to a remote form of work.

The growing role of information technology presents new challenges and opportunities for universities. This, for example, facilitates scientific research, 3-D modeling of cultural and historical objects, digitization of historical documents, etc. Information technologies allow universities to better communicate with stakeholders, develop business relations, improve scientific and educational processes, receive feedback from students, etc.

Development of social networks (Facebook, Instagram, Linkedln, Youtube, X (formely Twitter), TikTok), messengers (Facebook Messenger, WhatsApp, Viber, Telegram, Snapchat, Discord, Signal, Skype, iMessage, Dust, GoogleChat) and online platforms (Microsoft Teams, Coursera, Udemy, Teachable, Udemy, SkillShare, Moodle) is accompanied by changes. The developers of these applications and services add new functions and tools. This allows both users and universities to improve the communication process: exchange information, conduct online classes, perform various scientific tasks, etc. It is not an exception that new social networks, messengers and online platforms for learning will be created, and existing ones will lose popularity.

It can be predicted that new user segments may appear in the category of stakeholders (students, teachers, applicants, partners and other universities, employers, state authorities and local self-government, public and charitable organizations). In particular, university graduates who want to re-enroll in another specialty, or private entrepreneurs for their professional development. In such cases, universities should develop such communication processes taking into account the specifics of these stakeholders. For example, educational courses taking into account the work experience of graduates who will be re-educated, educational programs for private entrepreneurs, depending on the sphere of their operation. Universities in such cases can add information to their official websites, make changes and improve their courses on online learning platforms, etc. As an example, universities can look for potential students among working people, in particular on the LinkedIn social network, where users share their achievements and fields of employment. The use of various services and applications will allow working people to attend online training courses, complete assignments, and communicate with teachers in their spare time.

It is predicted that the number of users of social networks, messengers and online platforms for learning will increase in the world. In particular, ordinary users can have accounts in several social networks and messengers at once, or have several accounts in a social network. Also, government institutions, commercial enterprises or universities have accounts in several social networks and messengers. However, if in the case of universities, their number in the world does not seriously change, then in the commercial sphere there is an increase in the number of both private entrepreneurs and companies.

Conducted research indicates that in 2024 and 2025 there will be an increase in the number of users of social networks, messengers and online platforms for learning. Thus, in 2024, the forecast value of the number of users of educational online platforms will be 585,0 million users, in 2025 – 676,0 million users. The forecast value of the number of messenger users in

2024 and 2025 will be 8003,0 and 8576,0 million users respectively. The forecast value of the number of social network users in 2024 will be 12386,0 million users, and in 2025 – 13430,0 million users. The conducted research shows that social networks have the largest annual increase in the number of users, and online educational platforms have the smallest.

7. Conclusions

Successful development of educational institutions, including universities, requires effective management and use of all opportunities of the external environment. The information sphere provides many opportunities for universities and students to develop. Accordingly an effectively established communication system at the university with stakeholders should be a management priority. The modern development of the economy and society is characterized by the growing role of information technologies. The increase in the number of users of social networks and messengers, the creation of new online platforms for learning allows universities to be flexible, conduct distance learning, better inform their students and partners, and place educational materials.

Six groups of stakeholders in the process of formation of the communication system have been identified for universities: (students, teachers, applicants, partners and other higher education institutions, employers, state authorities and local self-government bodies, public and charitable organizations). It is recommended that universities use social networks and messengers across stakeholder groups. In particular, it is advisable to communicate with such groups of stakeholders as "students" and "applicants" of the university through social networks Instagram, TikTok, Youtube and use messengers Telegram, Viber, WhatsApp.

The formed model of the system of means of communication of universities with stakeholders includes 4 groups of tools: online learning platforms; official websites and corporate mail of universities; messengers; social networks. This model assumes the following three goals: an informative goal, an educational goal, and an image goal. The proposed functions of the university communication system for communication with stakeholders (interested parties), namely: students, teachers and applicants. The use of these functions will allow universities to increase the effectiveness of the communication process.

The role of social networks and messengers in the process of communication and data exchange is growing. The number and quality of online learning platforms are increasing, allowing teachers to better organize the learning process, check assignments, and monitor students' independent work. With the help of online learning platforms, students can be mobile, start remotely, view training courses, communicate with teachers or other students.

In the course of further scientific research, a more detailed study of the tools of the communication process will be an urgent issue. This will make it possible to determine their impact on the effectiveness of student learning and to formulate recommendations for the further communication policy of universities.

8. References

[1] A. Lytvynchuk, H. Tereshenko, A. Kyrianov, I. Gaiduk. Improvement of Information Support for the Functioning of the Inclusive Education System, Scientific-practical journal "Educational Analytics of Ukraine" 2 (2021) 82–92. https://doi.org/10.32987/2617-8532-2021-2-82-92.

[2] S. Londar, M. Horna. Education Statistics and Monitoring Tools for Achieving the 4st Goal of Sustainable Development, Scientific-practical journal "Educational Analytics of Ukraine" 2 (2021) 5 –19, https://doi.org/10.32987/2617-8532-2021-2-5-19.

[3] Kisiołek, A., Karyy, O., Kulyniak, I. The Concept of a Digital Marketing Communication Model for Higher Education Institutions. In: Raj, J.S., Shi, Y., Pelusi, D., Balas, V.E. (eds) Intelligent Sustainable Systems. Lecture Notes in Networks and Systems, vol 458. (2022) 75-89. Springer, Singapore. https://doi.org/10.1007/978-981-19-2894-9_6.

[4] I. Zharska. Principles of organization of marketing communications of university with the entities on the internet network, Scientific Bulletin of KSU. Series «Economic Sciences», 37 (2020) 34-40. https://doi.org/10.32999/ksu2307-8030/2020-37-6.

[5] Kisiołek, A., Bondarenko, Y., Ohinok, S. Comparative analysis of Ukrainian higher education institutions popularity on the internet. Economy and Society 24 (2021). https://doi.org/10.32782/2524-0072/2021-24-14.

[6] Kisiołek, A., Karyy, O., Halkiv, L. The utilization of Internet marketing communication tools by higher education institutions (on the example of Poland and Ukraine). International Journal of Educational Management, 35(4) (2021) 754–767. https://doi.org/10.1108/IJEM-07-2020-0345.

[7] R. Miroshnyk, I. Matviy, L. Halaz, I. Bahlai, Trends in the development of online platforms for distance learning, in: 17th IEEE International Scientific and Technical Conference on Computer Sciences and Information Technologies, CSIT 2022, Volume 2022-November, pp. 260–264. doi:10.1109/CSIT56902.2022.10000065.

[8] R. Miroshnyk, I. Matviy, I. Bahlai and L. Halaz, "Peculiarities of E-learning in Modern Conditions and Prospects for its Development," 2023 IEEE 18th International Conference on Computer Science and Information Technologies (CSIT), Lviv, Ukraine, 2023, pp. 1-4, doi: 10.1109/CSIT61576.2023.10324039.

[9] Dr. Rini Saxena, Ms. Parminder Pal Kaur, Mr. Amit Saxena. Role of Information Technology in Education During Covid-19 Pandemic. International Journal of Advanced Science and Technology, 29(8s) (2020) 4071-4078. Retrieved from http://sersc.org/journals/index.php/IJAST/article/view/25414/

[10] Entradas, Marta , Bauer, Martin W., Marcinkowski, Frank and Pellegrini, Giuseppe (2023) The communication function of universities: is there a place for science communication? Minerva. 62 (2024) 25–47. https://doi.org/10.1007/s11024-023-09499-8.

[11] Bondarenko Y., Ohinok S., Kisiołek A., Karyy O. Interest in universities based on search queries on the Internet. Innovative Marketing 17(3) (2021) 179–190. 10.21511/im.17(3).2021.15.

[12] Karyy, O., Novakivskyi, I., Kis, Y., Kulyniak, I., & Adamovsky, A. Model of Educational Process Organizing Using Artificial Intelligence Technologies. In: CEUR Workshop Proceedings, 7th International Conference on Computational Linguistics and Intelligent Systems, COLINS 2023, Volume 3403, pp. 332-347.

[13] Halkiv, L., Karyy, O., Kulyniak, I., Kis, Y., & Tsapulych, A. The national system of higher education and government procurement for its services as activators of the development of IT entrepreneurship. In: CEUR Workshop Proceedings, 5th International Conference on Computational Linguistics and Intelligent Systems, COLINS 2021, Volume 2870, pp. 1338-1349.

[14] 15 Best Online Learning Platforms in 2024. Retrieved from https://www.hurix.com/15-best-online-learning-platforms.

[15] App Data. Retrieved from https://www.businessofapps.com/data.

[16] Official site Udemy. Retrieved from: https://www.udemy.com.

[17] Official site Teachable. Retrieved from: https://teachable.com.

[18] Communication. Retrieved from: https://www.statista.com/markets/424/topic/2494/communications/