

## STRATEGIES FOR EFFECTIVE COMMUNICATION IN EDUCATIONAL ENVIRONMENT IN WARTIME

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**Abstract.** Rapid changes in society, caused by the development of information and communication technologies (ICT), and the challenges provoked by the COVID-19 pandemic, present the education system with the task of forming a new educational environment to ensure the quality training of modern specialists. Currently, for Ukraine, the virtual education space has acquired additional significance, since after the start of the Russian military aggression, unprecedented for the 21st century, the use of distance education technologies has become relevant. The purpose of the article is to analyze digital distance learning platforms, determine their effectiveness, and define perspective strategies for effective communication in the educational environment in wartime. The study uses general scientific research methods (analysis, synthesis, induction, and deduction). The paper is based on the principles of generalization, concretization, and abstraction. The study also used the axiomatic method, which involves the ascent from theoretical positions (axioms) to specific conclusions, and the statistical method Student's t-test. The conducted survey revealed the benefits of Google applications for both virtual and in-person education spaces. The conclusions defined that blended learning is more productive and preferable for students, as it leaves more time for students to improve themselves and implement their projects, and for teachers to do scientific work. It is essential to apply digital technologies for remote and blended education in Ukraine, as it leads to budgetary funds savings, assuring the maximum implication of all participants of the educational process, including the virtual one.

**Keywords:** educational environment, blended learning, digital platforms, Google applications, virtual space.

### Introduction

On February 23, 2022, on the website of the Cabinet of Ministers of Ukraine, Order No. 286-r "On the Approval of the Strategy for the Development of Higher Education in Ukraine for 2022-203" was published. Minister of Education and Science of Ukraine Serhii Shkarlet noted that despite the difficult situation in Ukraine, our main task is to continue the educational process. It is also important to reform the education system following new challenges. It is this strategic document that defines the main priorities of the higher education system at the current stage of development of society and the country's economy, as well as the main characteristics that will be formed by 2032. The strategy was adopted on February 23, a day before the full-scale war launched by Russia against Ukraine [1].

The modern realities of our lives today are very complex in Ukraine. In wartime, given the existing threat to the life and health of all participants in the educational process located in dangerous regions, and the migration of the population to safer regions, it is becoming increasingly important to introduce the latest and innovative methods of teaching students to create a safe educational environment, to organize the receipt of quality education in these conditions. Thus, psychological aspects and pedagogical conditions must be taken into consideration so the education process to be more student-centered.

As far as Ukrainian secondary education is concerned, it was strongly supported at the state level at the beginning of the Covid-19 pandemic. Thus, such projects as "All-Ukrainian online school", "Learning without borders", and "Support the child" were launched on TV channels and had mobile applications and occurred to be successful. But high education was not covered in these projects. The Ukrainian universities made up their communication strategies.

The issue of analyzing educational space as a whole and some of its concrete aspects was the research subject of several national and foreign scholars and scientists.

W. Badke analyzed teaching research processes in the education space and considered that the aim of this was to transform education from what some see as a predominantly one-way practice of imparting knowledge to an interactive practice involving the core research tasks of subject disciplines [2].

The comparative analysis of the main phases of ICT development in the education space of the Scandinavian region is presented by A. Roliak. The scientist states that the progress of using ICT in the system of professional teacher training was parallel to the processes of informatization, computerization,

technological alteration, and highlighting of skills evolution in all countries of the Nordic region and is the key feature illustrating innovation and digital literacy strength in Nordic dimension [3].

O. Chaikovska, I. Semenyshyna, O. Muliarchuk, I. Koval investigated the impact of technology, mainly the Podcast application on mastering students' writing and speaking skills. The results of the experiment proved the benefits of Podcast in the educational environment, although only students' writing skills were enhanced while there was no significant improvement in speaking skills [4].

L. Hutchinson studying the educational environment underlines that learning depends on several factors, but a crucial step is the engagement of the learners which is affected by their motivation and perception of relevance. These, in turn, can be influenced by learners' previous experiences and preferred learning styles and by the context and environment in which the learning is taking place. In adult learning theories, teaching is as much about setting the context or climate for learning as it is about imparting knowledge or sharing expertise [5].

I. Humeniuk was observing pedagogical support technology applied in the education space at higher education institutions, the purpose of which was to raise the professional motivation of future engineering teachers [6].

A. Howell et al focused on the positive influence of feedback on the effectiveness of communication in the educational process. Scholars believed that praising a student can assist to create a supportive educational space and lead to academic achievements [7].

Recently the problem of education space, namely virtual education space, has become one of the most studied due to the increase in online period of tuition. But the Ukrainian dimension is more challenging because of the war, as it deals not only with distance education, but with the absence of electricity, studying in shelters, bombing, population migration, stress resilience, and many other issues influencing the content and form of the process, so it needs more precious observation.

During the pandemic, the process of distance learning, which can be carried out in synchronous and asynchronous modes using educational platforms, has already been applied. But the variety of these digital instruments can be overwhelming for all the participants in the educational process. Besides while planning the use of different digital sources, the teacher should consider that the time for processing these materials cannot exceed the duration of asynchronous classes [8].

Thus, the article is aimed to sort out digital remote learning platforms, measure their effectiveness, experimentally test the pedagogical conditions, and identify promising communication strategies for the formation of effective communication in the educational environment in wartime.

## **Materials and methods**

The following theoretical and empirical methods were used in the research: analysis, scientific observation, and such diagnostic methods as surveys and interviews. Also, the axiomatic method was applied in the study. It presupposes the ascent from axioms or postulates to specified conclusions. Generalization, concretization, and abstraction are the key principles introduced in the paper.

The research consisted of three stages: 1) the pre-study survey and pre-test; 2) the study process with Google applications involvement; 3) the post-study interview and post-test with data analysis using the statistical method Student's t-test.

The survey dedicated to education space, namely virtual education space, among the bachelor students of engineering specialties was conducted at the beginning of the 1<sup>st</sup> semester 2022-2023 at the Higher Educational Institution "Podillia State University" using Google form (<https://forms.gle/ZRkaPhEoY8Q7FJWB9>). The total number of respondents was 142. The students were divided into an experimental group (EG) and a control group (CG), each consisting of 71 students. The students of the experimental group (specialty "Mechanical Engineering") were taught ESP with the application of Google apps they had indicated as the most convenient for studying. The control group was studying traditionally on the Moodle platform which was prioritized at the university for all subjects during remote education.

The study process in the fall semester of 2022-2023 was organized due to the situation in the country and consisted of both online and in-person education periods.

The follow-up interview was conducted with engineering students and teachers involved in the tuition and was aimed at discovering the virtues and vices of the education space created.

The final stage of the research was dedicated to processing data using the Student's t-test and making an overall SWOT analysis of the educational space at the Podillia State University in wartime based on the experience and results obtained.

## Results and discussion

The abundance of digital tools for education is impressive and frequently both teachers and students are confused by using all of them. So, it was decided to limit the educational space to just Google applications at ESP classes, because according to the results of the survey, they were the most familiar to students and available on phones, moreover, according to the conditions of Ukrainian mobile operators, an additional fee for their use was not charged. Although the university has the Moodle platform, where all the disciplines listed in the curriculum are covered, there are some challenges with teaching ESP using just this platform [9], and mastering speaking skills must be fulfilled through other technology and techniques.

The primary stage of the research was dedicated to the pre-study survey, aimed at defining the most appropriate education space familiar to students. The students were asked 10 questions about educational space listed in Table 1.

Table 1

### Pre-study surveys

No	Question
1	What are your preferable gadgets for online studying?
2	Do you have a Google account?
3	Do you use Google applications?
4	How often do you use Google applications for studying?
5	What is the most frequent Google application for your studying?
6	What is the most convenient Google application for your studying?
7	What Google application would you prefer to use at ESP class?
8	What Google application is the best for obtaining communication skills at ESP?
9	What app or program is the most effective for mastering speaking skills during online studying?
10	What type of education (online, in-person, blended) is the most effective for obtaining foreign language communication skills?

Based on the survey results the following studying process (blended one) was scheduled. As it was found out mobile phones were the most popular gadgets (Fig. 1) among students for online education. Considering free access for all Google apps and their availability the remote online ESP classes were built based on these applications. Each online class was conducted synchronically using the Google meet platform with Google presentations for new information providing, Google Jamboard – for fulfilling practical tasks. All the tests were given on Google forms and the home assignment was suggested in Google class. Having such a Google app as the Google Meet Attendance list it was easy not only to check the fact of students' presence in the online meeting but also their duration. During in-person classes, such Google apps as Google presentations were used. Digital Google instruments were widely applied in ESP classes.

In wartime conditions, a feature of distance learning is the possibility during online meetings of situations when the signal "Attention, air alert" is activated. Thanks to the asynchronous mode of distance learning and the use of all modern learning methods, we can solve several problems and provide quality educational services to our applicants. Online education is an extremely important method of maintaining the continuity of the educational process during military operations in the country. It is not known how long such a situation will last, but the teacher still can maintain contact with students, be ready to provide support and explanations, and constantly check their work. Such opportunities should be considered not only as forced measures, but also as a time to improve and modernize the educational process, which can be achieved by using interactive tools for teaching foreign languages.

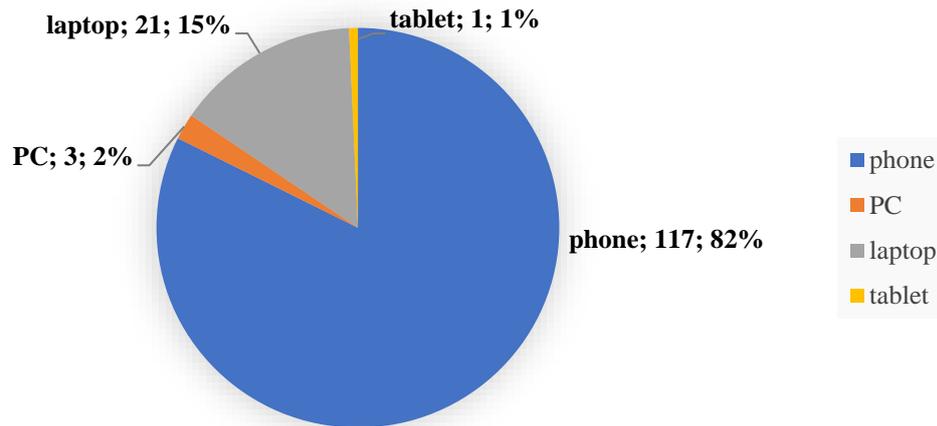


Fig. 1. Preferable gadgets for online studying

Among the digital tools that students would like to use for studying ESP (Fig. 2) the following were named: Google meet (59.9%), Google class (21.9%), All available (9,2%), No one (3%), No matter which (2%), Viber (1%), Zoom (1%), Discord (1%), Google translate (1%).

Preferable digital tool for ESP class

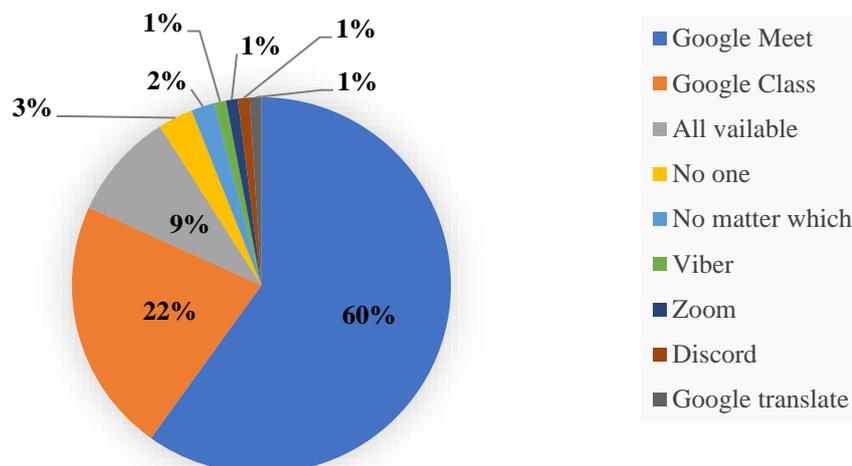


Fig. 2. Preferable digital tool for ESP class

Thus, Google Meet was selected as option No 1 for distance learning for the experimental group. Among the benefits of Google Meet there are the possibility to have up to 150 users at the same time; to plan classes and link them to the Google calendar; to record classes with video saving them on Google drive; synchronization of scheduled classes is performed automatically on all devices, so you can start a meeting on a computer and end it on another device, for example, a phone, the duration of the session can be up to 300 hours, etc. In the context of online interaction, the integrity of curricular and extracurricular activities was guaranteed by the Google Classroom app, which was used as the main means of communication with students in case it was impossible to provide a live lesson in Google Meet because of air raid sirens or the lack of electricity. All the announcements, guidelines, and tasks were uploaded there. This kind of communication was very productive and dynamic due to Google alerts. This virtual classroom provided students with learning materials as well as the possibility to self-study and self-check. To practice listening and speaking skills, students need to be able to listen to the language and reproduce it, and this was provided through Google podcasts (Elon Musk podcasts, <https://redcircle.com/shows/elon-musk-pod> were used with engineering students), which could be listened to live or downloaded for later.

To check the effectiveness of the applied pedagogical conditions through a pedagogical experiment, such criteria as motivational, cognitive, technological, and social were used. The motivational criterion is represented by such indicators as awareness of the importance of one’s intellectual development; the

presence of a persistent interest in intellectual activity. The indicators of the cognitive criterion include knowledge of intellectual mobility and one's psychological characteristics; formation of thinking qualities (flexibility, speed, depth, independence); mastery of thinking operations; manifestation of creativity in intellectual activity. Indicators of the technological criterion are possession of instrumental competencies (ability to communicate in native and foreign languages, computer skills and use of Google applications, information management skills). For the social criterion – the manifestation of adaptively important personal qualities: business acumen, emotional stability, responsibility, activity; sociability and formation of communicative interaction skills; manifestation of tolerance, recognition of the fact of diversity of views on the same issue; perseverance in achieving the goal.

According to the defined criteria and indicators, the levels of formation of effective communication in the educational process have been established: reproductive, which involves the elementary manifestation of indicators according to all criteria; variable, characterized by a situational manifestation of quality formation; creative, in which the student is focused on creativity, independent implementation of projects, can quickly find, analyze and productively apply growing streams of information.

Two-stage testing was done with the students of both experimental and control groups at the beginning and at the end of the semester (before and after the application of the abovementioned Google apps and pedagogical components with the EG).

The analysis of the results of the experimental research using the Student's *t*-criterion made it possible to state that the indicators of the levels of the formation of effective communication in the educational environment both in general and in individual components increased significantly in EG, while in CG, insignificant positive dynamics were recorded (Table 2). Differences in indicators between the groups are substantial and make up the value at the  $p \leq 0.05$  level.

Table 2

**Levels of formation of effective communication in the educational environment  
before and after completion of the formative experiment, %**

Components	Groups	Levels					
		Reproductive		Variable		Creative	
		before	after	before	after	before	after
Motivational	EG	38.15	14.85	51.10	49.60	10.75	35.55
	CG	37.45	29.90	50.40	56.80	12.15	13.30
Cognitive	EG	21.50	14.80	56.70	50.60	21.80	34.60
	CG	20.75	17.85	57.90	55.15	21.35	27.00
Technological	EG	35.60	18.25	46.80	54.50	17.60	27.25
	CG	36.70	25.90	49.25	56.30	14.05	17.80
Social	EG	15.20	11.90	62.80	61.55	22.00	26.55
	CG	13.80	13.90	64.70	65.50	22.30	20.60

Thus, the most significant change in indicators of the motivational component of the formation of intellectual mobility is observed: the number of students in EG with the reproductive level of formation of the specified component decreased from 38.15% to 14.85% (in CG – from 37.45 to 29.90), while the creative level increased from 10.75 to 35.55% (in CG – from 12.15 to 13.30%). Also, the positive dynamics are observed in the cognitive component for EG (from 21.80 to 34.60%); the technological component (from 17.6 to 27.25%), and the social component having the lowest increase (from 22.00 to 26.55%).

The results of the control experiment confirmed our hypothesis that the formation of effective communication in the educational environment in the conditions of distance learning (and martial law in particular) can be achieved thanks to the implementation of reasonable pedagogical conditions, the use of Google tools and applications, considering the wishes of students and their current psychological state.

Since 1969, SWOT (S – strength; W – weakness; O – opportunity; T – threat) analysis has been successfully used in various industries. The main idea of the method is to identify and evaluate the possibilities of developing an idea, activity, or process based on a detailed examination of the identified factors that are decisive during decision-making [10].

The following SWOT analysis of the educational process in wartime (Table 3) was developed as the result of the research (based on the pre-study survey, the learning process itself, and the post-study interview) and aimed at improving managerial decisions and the tuition process of the educational space in wartime. As defining criteria, we chose a standard list adapted to the conditions of the educational process: financial resources; physical resources; human resources; access to resources; internal processes.

Table 3

### SWOT analysis of educational space in wartime

Strengths	wide scope of Google Workspace for education;
	increasing the competence of participants in blended learning;
	expansion of the target audience, involvement of guest lecturers and IT specialists;
Weaknesses	limiting corporate access to resources;
	restrictions on the teacher's freedom in the educational process;
	education under stressful circumstances; teacher's involvement 24/7.
Opportunities	consolidating interdisciplinary connections;
	strengthening the student-teacher connection.
	trendy technologies expand the content potential of resource courses;
	widening global collaboration;
	lifelong learning;
	fundraising due to qualitative organization of the educational process; saving natural and energy resources;
Threats	air raid sirens;
	absence of electricity;
	poor internet;
	loss of highly qualified and competitive personnel due to migration.

The SWOT analysis of the educational space during the war in higher education institutions proves that the weak sides prevail over the strong ones, this is understandable given the circumstances. However, the number of opportunities that appear in such a non-standard period of Ukrainian existence in contrast to the fatal threats testifies to the irresistible thirst for development and knowledge that is inherent in the Ukrainian educational environment now.

### Conclusions

1. In the context of globalization and the constant growth of the role of information technology, it is successful communication that helps achieve the necessary European integration goals for Ukraine even in wartime. Strategies for effective communication in the educational environment in wartime are fully dependent on the current situation and must be flexible and adaptive to satisfy the need of every participant in the education process.
2. Virtual reality with the use of ICT in education contributes to the creation of an interactive educational virtual environment using a set of tools, and methods for creating and implementing virtual images to actively interact with them or within them under a high level of reliability. In the conditions of virtualization and informatization of society, the modeling of a virtual educational environment serves as the basis for identifying the didactic potential of the modern educational environment and the possibilities of its practical implementation in the educational process.
3. Google applications, predominantly Google meet and Google class, being preferable among the students during the pre-study survey, proved their validity, and their application in combination with engineering podcasts with the experimental group improved indexes of each defined component of effective communication in the educational space: motivational, cognitive, technological, and social. Thus, the level of creativity in EG increased from 10.75 to 35.55% (motivational component); from 21.80 to 34.6% (the cognitive component); from 17.60 to 27.25% (technological component); from 22.00 to 26.55% (social component).

4. According to the SWOT analysis, the Ukrainian educational space is very challenging during wartime, it has more weaknesses than strengths, but obviously, despite threats, the quantity of opportunities prevails, and this is the inevitable trait of progress and development.

### Author contributions

Conceptualization, I.H.; methodology, N.P. and O.K.; software, I.M.; validation, I.H., and O.K.; formal analysis, I.M and N.P.; investigation, I.H., I.M., N.P. and O.K.; data curation, I.H., O.K. and N.P.; writing – original draft preparation, I.H.; writing – review and editing, I.H. and O.K.; visualization, I.M., N.P.; project administration, I.H.; funding acquisition, I.M. All authors have read and agreed to the published version of the manuscript.

### References

- [1] Stratehiiia rozvytku vyshchoi osvitu v Ukraini na 2022-2032 roky [(Higher education development strategy in Ukraine for 2022-2032). (2022). [online] [15.04.2022]. Available at: <https://mon.gov.ua/storage/app/media/news/2022/04/15/VO.plan.2022-2032/Stratehiya.rozv.VO-23.02.22.pdf> (In Ukrainian).
- [2] Badke W.B. Chapter 8 – Research processes transforming education. Teaching research processes, 2012, pp. 163-177.
- [3] Roliak A. ICT implementation in the system of teacher education: Nordic dimension. Information Technologies and Learning Tools. Vol. 69, No. 1, 2019, pp. 258-267. DOI: 10.33407/itlt.v69i1.2361
- [4] Chaikovska O., Semenishyna I., Muliarchuk O., Koval I. Impact of technology on speaking and writing skills of masters in engineering ESP learning. Proceedings of 21<sup>st</sup> International Scientific Conference “Engineering for Rural Development”, May 25-27, 2022, Jelgava, Latvia, pp. 878-883. [online] [18.03.2023]. Available at: <https://www.tf.llu.lv/conference/proceedings2022/Papers/TF274.pdf>
- [5] Hutchinson L. Educational environment. BMJ, 2003, 326 p. Available at: <https://www.bmj.com/content/326/7393/810>
- [6] Humeniuk I., Mushenyk I., Chaikovska O., Humeniuk O. Motivation enhancement of future engineering teacher by means of pedagogical support. Proceedings of 21<sup>st</sup> International Scientific Conference “Engineering for Rural Development”, May 25-27, 2022, Jelgava, Latvia, pp. 426-431. [online] [18.03.2023]. Available at: <https://www.tf.llu.lv/conference/proceedings2022/Papers/TF147.pdf>
- [7] Howell A., Caldarella P., Korth B., Young K.R. Exploring the Social Validity of Teacher Praise Notes in Elementary School. Journal of Classroom Interaction. Vol. 49, No. 2, 2014, pp. 22-32. [online] [18.03.2023]. Available at: <https://eric.ed.gov/?id=EJ1100431>
- [8] Boix M.V., Dawes D.E. Targeted Assessment of Students’ Interdisciplinary Work: An Empirically Grounded Framework Proposed. The Journal of Higher Education. Vol. 78, Issue 2, 2007, pp. 215-237.
- [9] Humeniuk I., Kuntso O., Lebedieva N., Osaulchyk O., Dakaliuk O. Moodle as e-learning system for ESP class. Independent Journal of Management and Production. Vol. 12, No 6, 2021, pp. 646-659. [online] [18.03.2023]. Available at: <http://www.ijmp.jor.br/index.php/ijmp/article/view/1755>
- [10] Vaghner I. SWOT – analiz yak pidkhid do stratehichnoho analizu (SWOT-analysis as an approach for strategic analysis). Visnyk Kryvorizkoho ekonomichnoho instytutu KNEU, Vol. 4, 2009, pp. 81-84. (In Ukrainian).