DIGITAL TOOLS OF BUSINESS COMMUNICATION IN EDUCATIONAL ORGANIZATIONS OF EUROPE

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Abstract: *The article presents a comparative analysis of the digital competence of representatives of educational and scientific organizations in Europe, in particular Austria, regarding their ability to use digital tools in business communication. The study encompasses the results of experimental training conducted between 2022 and 2023, which includes a series of theoretical and empirical data: questionnaires and data from a pilot experiment, an educational component, and the results of a formative experiment. The study explores the adaptability of adults to the use of digital tools for business communication within a defined timeframe. Furthermore, it examines the changing dynamics of digital tool usage, particularly Facebook, Messenger, Instagram, YouTube, and ChatGPT, identifying the most popular and user-friendly business communication digital tools for educators.*

In the course of experimental training, it was established that the level of digital competence in utilizing modern digital tools for business communication significantly improved. This improvement was statistically confirmed using the Wilcoxon signed-rank-test. The data obtained validate the efficacy of the chosen methodology for instructing adults in the use of digital tools for business communication.

Moreover, the study revealed that, following the training, representatives of European educational organizations began to actively and effectively use digital tools for business communication in various speech genres, such as short messages, business letters, group chats, newsletters, business audio essays, business video content, and business emoticons. The research also identified specific scenarios of professional

business interaction among participants from educational organizations that involved the use of modern digital tools.

Keywords: modern digital tools, digital competence, business communication, genres of business communication

INTRODUCTION

Today, society is moving from a society of knowledge to a society of competent citizens. In this context, possessing computer literacy is a necessary condition for effectively using digital technologies in business communication.

The European Union has taken active steps towards implementing its own developed system of forming digital competence among its residents of citizens. The European Digital Competence System, also known as Dig Comp, is a tool for increasing the level of digital competence of EU residents.

The modern business system of various spheres of production and services must take into account all these processes of change and transformation of the world. In this regard, educational institutions of all levels, international corporations, public associations and associations, we must rebuild communication processes as much as possible so that they meet the standards of life in the digital world, provide opportunities for such digital competences, knowledge and skills, so that the modern adult a person could be useful to the world and could live comfortably and qualitatively in a transforming world.

What skills can help a modern business person adapt to the world of digital technologies and globalization processes? We believe that it can be business communication skills and the ability to use digital tools (Kahoot, Mentimeter, ChatGPT, Flipgrid etc.). In our opinion, comprehensive digital competence in business communication should be possessed by all participants of business processes in various spheres of life and production, including students in various training programs.

In the field of science, there are many statements and views emphasizing the importance of improving the digital skills and abilities of pupils, students and adult members of society. Scientists worldwide are united in their conviction that digital tools are effective aids for modern individuals (S. Carretero, J. Garcia-Zubia, S. Skvortsova, N. Xenofontos, O. Budnyk, T. Blyznyuk; Mano, & Mesch, 2010; Mark, Voida, & Cardello, 2012; Salanova, Llorens, & Cifre, 2013; Mark, Iqbal, Czerwinski, & Johns, 2014; Salanova, Llorens, & Ventura, 2014; Morze, Smyrnova-Trybulska, & Kuzminska, 2018). Digital tools studies in business are dedicated to the work (Saran, 2011).

We are convinced that modern individuals with digital competences are able to make valuable contributions to the global economy as a whole.

In our research, we focus on people working in the field of education, who are part of a public association on, and have a wide age range (from 27 to 78 years old). They use the linguistic and stylistic arsenal of business communication tools in their daily work.

At this stage, it is necessary to integrate science and educational practices as much as possible to enable modern individuals to master the technologies of working with digital tools for high-quality and effective professional activity. Modern educators and researchers must possess versatile professional competences in business communication, which are based on the principles of fundamentality, systematicity, consistency, scientificity, perspective, connection with life. Researchers must possess the qualities that will allow them to perform both individual and collective tasks, they must be ready for self-education in the digital world. At the heart of our methodology is the improvement of researchers' abilities and skills use digital tools of business communication. This competence approach is determined not only by the results of higher education, but also by lifelong learning ("Recommendations of the Council on key competences for lifelong learning", 2018). It ensures clarity and comparability of learning outcomes, acquired competences, and qualifications, creating a solid basis for European and global integration.

Objectives of the study:

1. Analyze scientific monographs, publications related to the research problem.
2. Determine the range of competences in business communication and their criteria.
3. Specify modern digital tools that are effective for improving the quality of business communication.
4. Develop the technology for the experiment: the ascertaining and formative stage.
5. Present the results of experimental training based on the developed course "Modern digital tools in business communication" in the proposed article.

The research hypothesis is based on the assumption that the development of competence in using modern digital tools in the process of creating various genres of business communication is a) creating the conditions of global society for accessibility to new digital resources; b) training according to the developed course; c) respondents' personal interest in their own development and improvement of their own efficiency in the labor market.

Working with the online course "Modern digital tools in business communication" provides researchers with qualitative and permanent skills.

In the first part of this article, we presented the cross-cutting skills that researchers acquire in the process of learning to use digital tools.

In the second part, we analyzed the results of studies conducted from September 2022 to May 2023, demonstrating the use of technology for working with the online course "Modern Digital Tools in Business Communication." We have presented a set of measures and elements of analysis of surveys conducted with representatives of the international association who have completed this distance learning module in the online course of the Center of Ukrainian Researchers in Austria. The purpose of this study is to present the technology of developing skills and working with digital tools in the process of business communication.

1. ANALYSIS OF THE LATEST PUBLICATIONS ON THE PROBLEMS OF APPLYING ARTIFICIAL INTELLIGENCE IN BUSINESS COMMUNICATION

The problem of the development and functioning of artificial intelligence has recently gained serious importance. Scientists and progressive global humanity are trying to analyze the effects and consequences of the interaction of the human-artificial intelligence pair in many dimensions and facets. Artificial intelligence can be seen as a tool that serves to benefit humans and helps create innovative products. On the other hand, artificial intelligence can displace many professions from the job market. With the help of artificial intelligence, it is possible to automate any intellectual work on topics: thoughts, meanings, texts; two-dimensional images and photographs; editing and generation from scratch of video; creating and editing music of any genre; management of employees; investment and finance management.

The problem of business communication and the use of digital tools to improve its quality have been the focus of modern researchers. We are interested in the article by Silhanova, R. "German Business Letter from the perspective of language development" (Silhanova, 2016), in which the scientist examines the development, function, forms, standards, and aspects of the German business letter writing. Using the example of authentic texts, the article shows modern linguistic trends towards simplifying business communication in the modern world. Another work that piques our interest is the scientific research by Pikhart, M. "Electronic Managerial Communication: New Trends of Intercultural Business Communication (Pikhart, 2018). We have also analyzed the article by researchers Cerna, M. and Svobodova, L. "Internet and Social networks as a support for communication in the business environment – pilot study" (Cerna, & Svobodova, 2017). This paper provides a comparison of collected data regarding the utilization of various means of communication by small and medium size enterprises with their clients and the utilization of social networks for both private and corporation purposes. The results presented in the article "Artificial Intelligence in Business Communication: the Changing Landscape of Research and Teaching" (Getchell, Carradini, Cardon, Fleischmann, Ma, Aritz, & Stapp, 2022) are of significant importance in our research on digital tools in business communication. In this article the authors describe the current capabilities, challenges, and concepts related to the adoption and use of artificial intelligence (AI) technologies in business communication. The study (Iaia, Nespoli, Vicentini, Pironti, and Genovino, 2023) is the first to relate the perspectives of business communication, AI and knowledge management (KM), establishing a virtuous circle between KM and AI. At the centre of the proposed model are people, processes and technologies, based on which KM represents the ideal perspective to define the implementation of AI. This primarily involves augmented intelligence, as AI cannot entirely replace humans in business communication processes, notably due to the absence of emotional intelligence.

The active engagement of scientists in researching the effective application of digital technologies in business communication indicates the relevance of the chosen topic of scientific research.

2. DIGITAL SKILLS OF A BUSINESS COMMUNICATION RESEARCHER AS A CROSS-CUTTING COMPETENCE AND A KEY TO SUCCESS ON THE LABOR MARKET

The design and implementation of the educational program is based on the competency model of a specialist (across various training programs).

Today, it is generally accepted that competences are divided into two groups: subject competences and key competences. Key competences, also known as general competences, transferable skills, soft competences, transversal competences, are universal, not tied to a specific subject area. They must be balanced with special competences in the development of educational programs and their formation must be planned. It should be noted that academics differ about terms, but we adhere to the term "transversal competences" proposed by UNESCO proposed for general use in 2015. Transversal competences facilitate "learning transfer", allowing individuals to apply their acquired knowledge, skills and metacognitive abilities to real-life situations.

The online course developed for enhancing digital competence in business communication is aimed at fostering transversal competences to use modern technologies. The presence of transversal, namely digital competence in business communication enables individuals to feel comfortable in a constantly changing world, in an endless flow of information and transformation of textual content.

When considering a group of transversal skills in the process of teaching researchers in using digital tools for business communication in the online course "Modern Digital Tools in Business Communication", it is necessary to clearly define the core objectives. In this context, we are interested in several key aspects:

The development of competence in using digital tools for business communication includes four main directions:

1. focusing on understanding the main functional principles, concepts, and logic of using digital tools, developing one's own skills in using digital tools in the context of business communication;
2. training in responsible high-quality use of digital tools;
3. learning to use digital tools in business communication to effectively manage information
4. gaining practical experience in using digital tools for interaction and work in social networks in the context of business communication.

3. DISTANCE EDUCATION AS AN EFFECTIVE METHOD FOR DEVELOPING INTERMEDIATE SKILLS OF STUDENTS

The center of Ukrainian researchers in Austria was established in 2022, uniting 145 researchers not only from Ukraine, but also from Austria, Poland, Romania, and Belgium. The age range of the Center's community spans from 27 years old to 78 years old, and all its members are researchers who have diverse educational background, but have different training programs based on higher education in both Ukraine and Europe. The Center's activity encompass active scientific, educational and social engagement and involves the proficient use of digital tools for business communication.

The traditional approach to organizing the training of association members and using the center's classrooms and only these classrooms to master transversal skills of working with digital instruments is neither the sole nor the most effective option. In fact, working on these skills requires a lot of time, individual and team work, personalization, equipment. Consequently, a different structure is required: combining e-learning with distance learning. In addition, members of the association are geographically dispersed, residing in different countries, and gathering them for in-person training poses financial and organizational issues. With the implementation of distance learning, facilitated by the online course "Modern digital tools in business communication", three restrictions on the audience are eliminated: time, content and degree of personalization. All these elements are closely interconnected. More time allows for more intricate tasks and richer, more complex content. Extended time fosters autonomy, enabling individuals to engage with tasks independently and experiment with different ways to find information and use it constructively and effectively. Distance learning significantly improves the quality of the product, as students, including future philologists are not burdened by time constraints. They can explore topics at their own pace and feel less restricted by time while conducting research. Moreover, extended time allows students to tackle more difficult problems, rendering the learning process more engaging. The use of distance learning within the framework of the online course "Modern Digital Tools in Business Communication" encourages individuals to maximize their use of digital technologies. However, it is crucial to consider collaborative work when discussing autonomy. In distance learning, effective time management is vital, as the time allocated for working with specific digital tools and business communication texts and completing tasks, is limited. Deadlines require specific outcomes, such as creating a business cold email for communication with the CEO of a global corporation or international organization.

4. EXPERIENCE IN DEVELOPING THE DIGITAL TOOL SKILLS OF CENTER RESEARCHERS FOR BUSINESS COMMUNICATION THROUGH AN EXPERIMENTAL ONLINE COURSE

In 2022, the Center of Ukrainian Researchers was officially registered, and as of May 2023, it has already welcomed 145 participants. Consequently, it became necessary to create a specialized program for the development of both professional transversal competences of business communication researchers, namely the skills related to digital tools. The internal and external communication of the Center heavily relies on new information technologies and various types of digital applications. The initial stage of the endeavor involved assessing the existing digital competences of the Center's representatives, defining the level of these competences, and establishing curriculum criteria. One of the key success criteria for achieving the assigned tasks is the degree of independence and autonomy of the work. We took this criterion into account during the development of the experimental online course. Therefore, researchers who are members of the International Association of Austria are expected to develop the ability to independently use digital tools in business communication.

However, they must also exhibit a critical awareness of when and how to use these tools in different communicative interactions with external and internal partners. This was the primary goal of training the students in the online course "Modern digital tools in business communication".

The online course training was included in the curriculum for the first year of the Center's researchers and was divided into 5 activity groups.

As mentioned earlier, an independent module was developed specifically for the first-year students at the Center. The content was presented in the form of 5 blocks: 1) The art of writing a cold email; 2) Writing a memorandum; 3) Writing proposals; 4) Developing strategic issues for negotiations; 5) Writing a project report. Each block, in turn, comprised tasks of different levels of difficulty.

A total of 43 researchers from the International Center in Austria took part in the experimental training. It was not mandatory for all organization members to participate; instead, we offered the researchers the opportunity to voluntarily engage in the online course. At the beginning of the program in September 2022 we identified one group consisting of 43 researchers. The experiment was conducted at the Center of Ukrainian Researchers in Austria. Researchers were provided approximately 20–25 days to complete each group of tasks. The content was of a progressive level of difficulty, but did not align with the curriculum they typically received in their primary workplaces within educational institutions (universities or other professional associations): the module was entirely self-contained. The period of observed activity, for which we present some results and comments here, extended from September 2022 to May 2023. During this period, we performed diagnostic assessments to monitor the progress of the researchers who participated in the experiment. These assessments were conducted at different stages, both at the beginning and at the end of the online course, for the participants. The main skills we focused on included:

1. skills in using digital tools such as Kahoot, Mentimeter, Flipgrid, ChatGPT, Telegram, and YouTube;
2. architecture of oral and written text (communicative skills according to the principle of simple language);
3. interpersonal communication skills (partnership), organizational skills (time management, resource management);
4. skills in working with information.

5. EXPERIMENT RESULTS

5.1. Evaluation of the method of using digital skills developed by the organizers during the training module for the online course "Modern digital tools in business communication"

Table 1 below presents our assessment of skill needs for the first year of the Centre's Researcher Digital Skills Program. We assigned tasks to researchers aimed at developing their digital tool skills in business communication; the business communication text was a focal point as the primary output, created and distributed in society and in professional environments by means of digital tools. To assess these skills, we

used the Rensis Likert method (summary evaluation method). It consists in rating the skill mastery level of each participant on a four-point scale ranging from 1 "never" to 4 "very often". We calculated the average value based on these assessments, allowing us to determine the priority skill areas for each participant. One of the crucial aspects of business communication is the ability to write texts effectively. Therefore, the methodology of the course was focused on enhancing written communication skills. During the training, we assigned researchers tasks that included creating Instagram, Telegram, and Facebook pages as well as creating business texts, for example, developing and presenting a plan for a new project, creating a Viber chat group for exchanging messages in a business manner, creating a system of questions for strategic communication within the framework of management negotiations using ChatGPT. Researchers emphasize (Lund, Wang, Mannuru, Nie, Shimray, Wang, 2023) that ChatGPT and related technologies have the potential to significantly impact academia and scholarly research and publishing. However, it is important to carefully consider the ethical implications of these technologies, particularly in regard to their use by academics and researchers. While ChatGPT and GPT-3 represent major advancements in artificial intelligence, machine learning, and natural language processing, it is necessary to ensure that they are used ethically and responsibly for scholarly research and publishing. Many questions about the ethics of using GPT in academia and its impact on research productivity remain unanswered.

The online course also included a variety of interactive business communication tasks. We used Kahoot for interactive activities. This tool offers has great advantages – it is engaging, social, user-friendly and interesting. The KAHOOT, a digital tool created in 2013, enables quick creation of interactive content: quizzes, polls, and discussions. The process of creating a new business text takes only a few minutes. Another tool that facilitates business communication is MENTIMETER. It facilitates interaction with all participants in business communication. We used this tool to create presentations for business communication as it allows for conducting business surveys, receiving feedback on any issue, and presenting results to the target audience promptly. MENTIMETER is highly effective during business communication activities, including negotiations, and presentations at meetings, gatherings, with the help of MENTIMETER, online voting on various business issues can take place. We also focused on improving the oral business communication skills of researchers, and one of the tasks was to make a video on business communication, particularly for presenting projects using the digital platform Flipgrid. Flipgrid is widely used by business professionals worldwide, and it enhances the development of oral genres of business communication. Its applications range from exchanging business messages, feedback on new projects, presenting project plans, presenting the essence of memoranda, proposals, announcing agendas, and sharing corporate performance results, etc. These tasks collectively contributed to the development of digital literacy in business communication. We assigned tasks that involved setting up and managing YouTube channels, Instagram pages, developing synonyms with a positive aura for communication in business sectors, including agriculture, energy, beauty, and travel. Additionally, we proposed creating a strategic map for unanswered and closed questions to use in negotiations with representatives of the Global International Corporation

for presenting new projects and securing funding (the project must first be presented and presented via email). The information and figures provided in Table 1 are quite subjective, but they reflect the importance assigned to each skill. As seen in Table 1, our training process emphasized the quality of the written text in business communication. Many tasks were aimed at transforming, adding, condensing, editing, analyzing complex business cases. At the beginning of the work, in the first four months of distance learning, we paid less attention to time management, because the activities proposed initially required less time to complete. In the first few months, researchers at the Center created and registered their own Facebook pages, Instagram pages and YouTube channels. The texts for the internal and external Center activities improved in quality. Additionally, there were tasks that required a creative approach from researchers, as they involved working with various types of content, including images, texts, Internet links to sites, videos. When creating video content, participants considered the following factors (Lind, 2019): 1. Audience and purpose (the fundamental goal of each video is to convince a likely viewer of the video to support the individual persuasive business proposal); 2. Content requirements (external content must be correctly cited, include credible sources to support the proposal, comply with copyright regulations.); 3. Aesthetic requirements; 4. Technical requirements. To stimulate critical thinking, we designed tasks with deliberately incorrect algorithms to mislead researchers. For example, in the task of creating a presentation using MENTIMETER and submitting information to the group as part of a project proposal, we included provocations intended to violate the action algorithm during group creation or disrupt the structure of the business communication text. Not all participants identified meaningful errors, but everyone was able to recognize issues in the violation of the chat group creation algorithm. This helped us identify knowledge and skills and to improve the blocks of tasks in the process of experimental work.

T a b l e 1.Work on developing writing business communication skills in the first step (3months) of study of researchers (scale from 1 "never" to 4 "very often") – an example for a single individual

Business writing	Professional skills in business communication				
	Organizational (time management)	Critical thinking	Linguistic skills	Information skills	Text architecture
The art of writing a cold email	2	4	4	4	4
Writing a memorandum	2	4	3	4	3
Writing proposals	2	3	3	3	4
Development of strategic issues for negotiations	2	4	2	4	3
Writing a project report	3	3	4	3	4
Average	**2.2**	**3.6**	**3.2**	**3.6**	**3.6**

S o u r c e: Own work.

During the second step, students provided more complex written answers, leading to increased requirements for text architecture. Work on critical judgment was considered completed mainly during the first year, although provocative tasks were occasionally used. We paid more attention to time management, as task complexity increased. This allowed us to explore the implications of time management in terms of distance learning, whether tasks were completed as assigned, and whether the majority of students faced problems with meeting deadlines. Also in the process of implementing the distance learning technology for the proposed independent module, specific task groups related to experimental texts proved effective in developing interactive skills and information management skills (Table 2).

T a b l e 2. Presentation of the results showing the improvement in respondents' ability to use digital tools in working with genres of written business communication (Scale from 1 "never" to 4 "very often") – an example for a single individual

Digital tools	Genres of written business communication				
	The art of writing a cold email	Writing a memorandum	Writing proposals	Development of strategic issues for negotiations	Writing a project report
Mentimeter	4	2	4	4	4
Kahoot	4	3	4	4	4
YouTube	4	2	4	4	4
ChatGpt	4	2	4	4	3
Flipgrid	4	4	3	4	4
Average	**4**	**2.6**	**3.8**	**4**	**3.8**

S o u r c e: Own work.

5.2. Evaluation by researchers of the method for developing transversal skills of working with digital tools during business communication and in the process of the online course "Digital tools"

At the end of each activity stage, the researchers received a questionnaire that included a question on a Rensis Likert scale to assess their perception of the robot's level of skill with digital tools. Tables 3 and 4 below show the results for the period covered (study period at the Center from September 2022 to May 2023). This is based on certain opinions of the researchers and these results are partly subjective. Therefore, since the factor of subjectivity is taken into account, it is correct to speak not about results, but about assumptions. During the first stage (Table 3), we observed that the online course "Modern digital tools in business communication" had a positive impact on the researchers' understanding of business communication, text structure, vocabulary, in particular, synonyms and metaphors. Some researchers felt that they made progress while working on the suggested tasks. First of all, the skills

in writing a cold email in English improved, and they became better at organizing the structure of a cold email and using a broader lexical range. However, fewer students perceived significant improvement in their ability to write memoranda. An interesting aspect was the experience of researchers working with the ChatGPT digital tool, which served as their assistant. The process of working with artificial intelligence involves developing specific skills, such as formulating precise questions, identifying key semantic elements.

Table 3 also reflects the researchers' perspectives on two other aspects: writing proposals and developing strategic issues for negotiations, both of which were aimed at enhancing business communication skills. Researchers were also asked about which course tasks interested them the most, which ones they found difficult, and which tasks they considered redundant. The majority of students evaluated the program of this study very positively. The most interesting, in their opinion, were tasks for developing skills with such digital tools in the process of business communication, such as emailing with international corporations and working with the artificial intelligence of the ChatGPT.

T a b l e 3. Perceived importance of the online course "Modern digital tools in business communication" in the development digital skills in business communication among researches: 1 step of study (from 1 to 4) n = 43

Skills	1	2	3	4
The art of writing a cold email	9	16	10	8
Writing a memorandum	13	12	14	4
Writing proposals	9	18	9	7
Development of strategic issues for negotiations	7	11	12	13
Writing a project report	9	16	11	7

S o u r c e: Own work.

T a b l e 4. Perceived importance of the online course "Modern digital tools in business communication" in the development digital skills in business communication among researches: 2 step of study (from 1 to 4) n = 43

Skills	1	2	3	4
The art of writing a cold email	3	4	17	19
Writing a memorandum	9	13	14	7
Writing proposals	4	11	12	16
Development of strategic issues for negotiations	1	6	12	24
Writing a project report	5	11	16	11

S o u r c e: Own work.

In order to prove the effectiveness and importance of the online course "Modern digital tools in business communication" for the development of digital skills in business communication among researchers, the non-parametric Wilcoxon signed-rank test

was used. This criterion was chosen, taking into account the fact that one group of researchers was involved in the experiment. The Wilcoxon signed-rank test was used to assess the probability of a shift in the values of the characteristic – the degree of development of digital skills in business communication, which was measured in two different conditions "before" and "after" the involvement of the Center's researchers in the online course "Modern digital tools in business communication". We formulated and tested the following hypotheses at the α=0.05 level.

Null hypothesis (H0): the overall degree of development of digital skills in business communication among researchers of the Center at the end of the online course ("after" group) does not exceed the overall degree of development of digital skills in business communication among researchers based on the results of the first diagnostic section of the experiment ("before" group).

Alternative hypothesis (H1): the overall level of development of digital skills in business communication among the researchers of the Center at the end of the online course ("after" group) exceeds the overall level of development of digital skills in business communication among researchers based on the results of the first diagnostic section of the experiment ("before" group).

The effectiveness of the proposed online course was statistically proven according to each digital skill. Calculations were performed using the IBM SPSS Statistics software package. The results are shown in Table 5.

T a b l e 5. Calculation results Wilcoxon signed-rank test «before – after»

Skills	Z	Asymp. Sig. (2-sided)
The art of writing a cold email	−4.443[b]	0.000
Writing a memorandum	−1.332[b]	0.183
Writing proposals	−3.735[b]	0.000
Development of strategic issues for negotiations	−4.365[b]	0.000
Writing a project report	−2.678[b]	0.007

S o u r c e: Own work.

According to the results of calculations in Table 5, the null hypothesis was rejected and an alternative hypothesis was accepted in cases of development of such digital skills as: The art of writing a cold email, Writing proposals, Development of strategic issues for negotiations and Writing a project report. In these cases, the p-value is less than the established α=0.05. The null hypothesis was not rejected in the case of the development of the digital skill Writing a memorandum (p>0.05). The conclusion was formulated: the comparative analysis of the results of the first and second stages of the experiment proves the positive dynamics in the development of digital skills (The art of writing a cold email, Writing proposals, Development of strategic issues for negotiations, Writing a project report) in business communication among the researchers of the Center at the end learning the online course "Modern digital tools in business communication". It has been statistically proven that there have been no significant changes in the development of the digital skill of Writing a memorandum.

For the Wilcoxon signed-rank test, we calculated the effect size using the r index (Table 6).

T a b l e 6. Calculation results r-effect

Skills	Z	r-effect
The art of writing a cold email	−4.443[b]	-0.825
Writing a memorandum	−1.332[b]	-0.239
Writing proposals	−3.735[b]	-0.682
Development of strategic issues for negotiations	−4.365[b]	-0.873
Writing a project report	−2.678[b]	-0.547

S o u r c e: Own work.

According to the data given in Table 6, significant and above-average effects can be observed in the development of skills related to "The art of writing a cold email," "Development of strategic issues for negotiations," "Writing proposals", and "Writing a project report".

The dynamics of changes in the development of digital skills in business communication of the Center's researchers during the online training course "Modern digital tools in business communication" are monitored.

Figure 1 demonstrates the dynamics of changes in the development of digital skills of the Center's researchers in business communication at the 1st and 2nd stages of training.
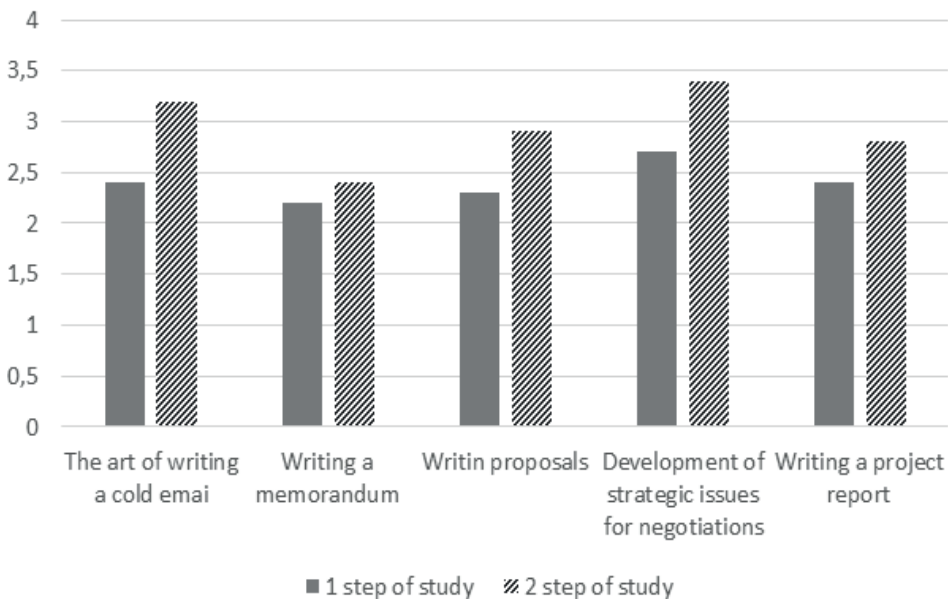
F i g u r e 1. Dynamics of changes in the development of digital skills of the Center's researchers at the 1st and 2nd stages of training

S o u r c e: Own work.

During the second stage of training (February-May 2023), the researchers experienced greater progress in the formation of skills for working with digital tools in the context of business communication. Particularly notable was the improvement in their ability to interact with artificial intelligence. The second stage of training following the proposed methodology and the results of the researchers' questionnaire, confirms the correctness of the chosen methods and methods of training, as well as the organization of training.

T a b l e 7. Importance of the online course "Modern digital tools in business communication" in the development digital skills in business communication among researches: 2 step of study (from 1 to 4) n = 43

Tools	1	2	3	4
Mentimeter	2	4	7	30
Kahoot	3	7	11	22
YouTube	4	6	8	25
ChatGPT	2	3	17	21
FLIPGRID	4	5	18	16

S o u r c e: Own work.

As previously mentioned, 43 students participated in the experiment during both the first and second stages of training at the Center.

The results of the study show that researchers' digital competence in applying digital technologies to business communication increased by an average of 14% after completing the experimental program. The results of the study show that the digital competence of researchers in using digital technologies for business communication increased significantly following the completion of the experimental program, as statistically proven using the Wilcoxon signed-rank-test.

This provides us with confidence in the correct content of the course, its usefulness and effectiveness.

CONCLUSION

These results lead us to believe that the online course "Modern digital tools in business communication" was useful and really helped the researchers to develop the digital skills for working with digital tools in the context of business communication. The digital skills acquired by the researchers will not only be utilized for conducting high-quality business communication in both oral and written forms, but also for other areas of professional activity, if circumstances arise for the transformation of the professional sphere. We believe that digital skills will boost the researchers' confidence in the dynamic world of digital technologies, increasing their marketability and overall success. We believe that the proposed training method at the Center of Ukrainian Researchers is correct and effective. It is confirmed by the experimental data based on performance results obtained from the two stages.

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