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Board.Net: Specifications and Features Providing Education without Boundaries

Nalyvaiko O. *, **Vakulenko A.**

V. N. Karazin Kharkiv National University, Kharkiv, Ukraine

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Abstract. The emerge of distance (or remote) learning in the educational arena under the influence of external factors has caused the necessity to adapt the classical learning format, using modern technologies to meet the needs of students with a focus on learning, careful processing and development of new skills and abilities under the guidance of teachers. The changes in the format of the educational process have also led to the need to modernize the format of arrangement and distribution of informational materials needed for learning among students and teachers, which, as a result, affected the transition of the latter to the use of virtual files on virtual platforms. As the title implies, the article describes the functioning of a cloud etherpad board.net as an alternative platform for synchronous and asynchronous distance e-learning, focusing on the specifications and characteristic features of the former. Much attention is given to the compliance of the interactive board with needs and wants of today's students and teachers by offering users a convenient format for learning, along with a range of tools and features that allow them to fully immerse themselves in the lesson without being distracted by searching for the required material, as well as separate platforms for attaching completed assignments and consulting with the teacher. The text also gives valuable information on advantages and disadvantages of the cloud interactive board, applied in the educational system, particularly in Ukraine, provides examples of its usage during the English class in workshop format for Ukrainian students of the School of Foreign Languages via the third type of complete orientation under the teacher's virtual supervision and offers the comparison of its application with competitors' ones for further consideration. We take the article to be of great help to the researchers on modern education, specialist in the implementation of technology and digitalization into the educational process, teachers specifically of English as a foreign language as well as of other disciplines and for all those interested in using interactive whiteboards to improve the quality of their learning, including ones who face different difficulties in making full use of modern programs and platforms in emergency situations, yet are having a desire and an intention to continue their education.
Key words: board.net, cloud etherpad, distance (remote) learning, education, virtual board, virtual file.

Платформа «BOARD.NET»: характеристики та функції для уможливлення освіти без обмежень

Наливайко О., Вакуленко А.

Харківський національний університет імені В.Н. Каразіна, Харків, Україна

Анотація. Поява дистанційного навчання на освітній арені під впливом зовнішніх факторів зумовило необхідність адаптувати класичний формат навчання за використанням сучасних технологій для задоволення потреб студентів з орієнтацією на навчання, ретельне опрацювання та розвиток нових навичок та вмінь під керівництвом викладачів. Зміни у форматі освітнього процесу також привели до потреби модернізувати формат розміщення та поширення інформаційних матеріалів, необхідних для навчання, серед студентів та викладачів, що, в результаті, позначилося на перехід останніх до використання віртуальних файлів на віртуальних платформах. Як передбачає назва, у статті йдеться про функціонування хмарного блокноту-дошки «board.net» як альтернативної платформи для синхронного та асинхронного дистанційного електронного навчання, акцентуючи увагу на технічних характеристиках та особливостях першого. Велика увага приділяється відповідності інтерактивної дошки потребам і бажанням сучасних студентів і викладачів шляхом пропозиції користувачам зручного формату для організації навчання разом із низкою інструментів та функцій, що дозволяють повністю зануритися в заняття, не відволікаючись на пошук необхідних матеріалів, а

* ***Corresponding Author:*** Oleksii Nalyvaiko. E-mail: nalyvaiko@karazin.ua
V. N. Karazin Kharkiv National University, Maidan Svobody, 4, Kharkiv, Ukraine.
Відповідальний автор: Наливайко Олексій Олексійович. E-mail: nalyvaiko@karazin.ua
Харківський національний університет імені В.Н. Каразіна, Майдан Свободи, 4, Харків, Україна.

також окремими платформами для прикріплення виконаних завдань та консультацій з викладачем. Стаття також надає важливу інформацію про переваги та недоліки хмарної інтерактивної дошки, що використовується в освітній системі, особливо українській, з прикладами використання першої під час уроку англійської мови для українських студентів факультету іноземних мов за третім типом орієнтації під віртуальним наглядом викладача, а також пропонує порівняння її застосування з конкурентними програмами для подальшого розгляду. Вважаємо, що стаття буде корисною для дослідників сучасної освіти, фахівцям із питань впровадження технологій та діджиталізації в навчальний процес, викладачам саме англійської мови як іноземної, а також викладачам інших дисциплін та всім, хто цікавиться використанням інтерактивних дошок для підвищення якості власного навчання, включаючи тих, хто стикається з різними труднощами використання сучасних програм і платформ у повному обсязі в умовах надзвичайних ситуаціях, але готові продовжувати навчання.
Ключові слова: віртуальна дошка, віртуальний файл, дистанційне навчання, освіта, хмарний блокнот-дошка, board.net.

I Introduction

Recent realization of the need to review and, if necessary, modernize the system of education as a whole, so that it can meet the requirements and needs of students [22], together with constant obstacles from social, cultural, environmental and political spheres faced by educational systems in a number of countries all around the world, including Ukraine, has led to the a more tangible division of education into the classical (full-time) form and the individual form, which, for its part, can be represented by distance learning [20], the one forced by natural disasters, pandemics, e.g. the recent spread of Covid-19 or martial law in Ukraine. In its turn, a non-stop digitalization of the learning process became a cause for the use of modern computer and mobile programs and applications, online systems, platforms [20; 21] and interactive whiteboards [16], along with a standard set of materials, which together provide students with comprehensive learning, making the educational process more interesting and convenient [19]. What is more, social media has taken one of the leading positions among alternative learning platforms that continue to expand their influence on the global educational system [6]. However, a holistic transition from an outdated learning system cannot but involve the combination of familiar elements with modernized and technological ones, such as a lesson where the teacher still plays the roles of organizer, expert resource, controller and provider of input within a distance format by using modern technologies [27]. Unfortunately, the problems of the present described above can periodically interfere with informative classes, depriving teachers or students of the opportunity to be provided with comfortable working conditions or means of communication during classes [1]. In this case, modern platforms and cloud systems can come to the rescue as well, which allows teachers and students to restore communication and offers a number of other useful features.

Nowadays virtual lectures or practical classes [23] are held not only with the help of prepared presentations in pdf or pptx formats, but also with the use of Zoom, Skype and other programs to allow teachers to accompany the lesson with their comments and supervision. It seems interesting that more often such classes, or materials for self-study, are structured on special virtual boards [13]. Virtual boards, or whiteboards, have been reviewed as major independent or subsidiary platforms for the curriculum, the main material coverage and the repository of additional information, tasks and links for students [14]. The success of their application in e-learning results in a demand for improvement of already existing boards and the emergence of new competitors, leading to more detailed studies being conducted by researches [27]. The possibility to find and / or develop the most useful for both students and teachers learning system in the context of distance education, which involves the use of digital tools and a variety of programs, applications and platforms, attracts experts in psychology, computer science and, of course, pedagogics. A great number of specialists tend to notice positive results from the involvement of modern technologies in classical learning formats, for instance: in the work “Using a virtual digital board to organize student’s cooperative learning” Lytvyn O., Bodnenko D., Proshkin V. and Kuchakovska H. [5] analyze a list of virtual whiteboards within the framework of distance corporative education, studying their characteristics, pros and cons and reveal the level of importance and usefulness of such applications in the learning process. In their turn, Giyong Jang, Salu Ylirisku and Nitin Sawhney focused their attention on the changed of live online education, previously challenged by such obstacles as the Covid-19 pandemic, providing the solutions for the reorganization of the teaching process with the help of digitalized tools, particularly the Miro board, tested in a workshop in their paper “Re-thinking Pedagogy and Dis-embodied Interaction for Online Learning and Co-Design” [11, p. 429].

The ways and results of using another whiteboard Padlet in education is described by Cynthia D. Fisher [9] in the research “Padlet: An Online Tool for Learner Engagement and Collaboration”, where she provided a detailed specification of the platform and analyzed its influence on the educational process.

Khoshnevisan B. & Rashtchi M. [12] study learners' perceptions of engagement in online learning environments in the context of learning English for Speakers of Other Languages (ESOL). A comparative analysis of the data showed that the use of online whiteboards in learning contributes to an increase in a sense of security, as well as an increase in the interest of participants in the educational process on feelings of support and learning new aspects of a foreign language.

Touching upon the issues of motivation in learning and the role of digital technologies in this process, and more specifically online boards, students of educational institutions will participate in any educational activity if they find it useful. According to Ransdell S., Borror J., Su A. [25], students have a developed sense of the usefulness of various activities. Is it worth my time? Will it help me get a better grade? You can increase the confidence and motivation of students by introducing online boards into the educational process as an interaction tool. But we must remember that the interaction within the course in the digital space can be as useful as the discussion in the classroom and the participants in the educational process need to find the balance themselves, and it is usually multifactorial. In fact, the active use of online whiteboards can encourage students to become active participants in the learning process, rather than passive observers. The article by Ransdell S., Borror J., Su A. [25] provides several examples of how online tools, in particular online whiteboards, motivated students to learn. The examples provided in this article are not exhaustive, but include: using an online whiteboard as a way to organize team learning, using other digital tools in combination, sharing files, creating a small learning community in a larger classroom, etc. Also an important factor is the analysis of the advantages and disadvantages of using discussion forums and their relationship with some conclusions about the theory of motivation. In conclusion, online whiteboards can be a very effective learning tool, but only if the participants in the learning process are highly motivated (teacher and students).

The variability in the use of online learning tools is an important factor in the effectiveness of learning in various conditions, especially in times of crisis. The use of online whiteboards in asynchronous learning is a vital means of engaging students and providing high quality learning. In the past, these boards were mostly text-based, but advances in technology have allowed educators to increasingly adopt discussion and teamwork formats to increase student engagement and learning [15].

The versatility of using online boards is confirmed by their versatility and suitability for various areas of science and education. For example, online whiteboards are an important learning tool for future medical professionals in the context of group work and critical perception of information, as well as visualization of processes in online learning [24].

The goals of the research. The article focuses on the study and the analysis of the cloud etherpad board.net as a platform in general as well as on the review of the functioning of all available features, the ways they may be used in distance education and the number of similarities and differences they have in comparison of those, offered by the competitors.

II Methods

Our study is based on the information prepared with the help of theoretical, experimental and comparative methods. The theoretical method of data collection involves the analysis of such available sources as scientific papers, researches and articles about the implementation of online platforms and / or programs with interactive boards and pads into education together with the specifications particularly considering board.net. The experimental method includes the quasi-experimental research conducted within a group of Ukrainian students of the School of Foreign Languages under conditions of martial law in a distance learning format during an educational workshop with the help of board.net. The comparative method is responsible for the comparison of the main qualities of interactive whiteboards as fundamentals for carrying out educational activities in a remote learning mode.

III Results

Board.net, in its turn, stands out from other similar services, which have been used in the education sphere lately. Board.net – an online area for the cooperative work, including completing tasks and creating projects – is a platform, run by an Austrian competence network Faircom since 2011 [3]. It is based on the Open Source Etherpad-lite technology and presupposes fair substantially free use with no advertisement and can be easily implemented into our business and / or educational environment due to the specific set of features installed, which are being constantly upgraded (https://www.fairkom.eu/en/boardnet). The platform is a convenient combination of a virtual board and a document that can be used in the format of remote learning together with other programs and applications to achieve the highest quality goals, set before a lesson, and in the format of asynchronous distance learning as an additional resource or as an alternative to classes with specific purposes. Apart from that, such a platform helps to maintain communication between a teacher and a student or between students in the absence of video and audio connection without any waste of time or effort. Board.net is one of the products of Faircom, representing the Cloud Service section, which implies one of its greatest advantages, i.e., the ability to use the board in real time, without unnecessary saves and registrations, which plays an important role in the preparation and conduct of classes with additional material, including illustrations. Moreover, a climate neutral hosting displays high quality, providing the users of board.net with a virtually uninterrupted real-time connection to the system, fast loading and safekeeping of all completed and unfinished projects in the cloud sphere without changing them [2; 3], which allows teachers and students return to them and reuse multiple times with or without further alternations. At the same time, no one has an excess to a particular board without a certain direct link or a specific name of the needed virtual file that creates a sense of security in the global network and a certain degree of privacy, which, in the scope of the educational system, additionally helps students to stay attentive and focused on the material provided.

In order to get accustomed with board.net and its characteristic features one only has to type the very name of the platform in a search bar. The official website with the excess to the interactive board [3] (https://www.fairkom.eu/en/boardnet) additionally provides its users with the information in German and English including a short description of the service, the main principles of its operation, FAQ's about the platform, the overall data about the company itself together with the list its other products.

The opening page [4] (https://board.net/) displays the greatest advantages of the board and offers to create a new one or open an existing one by entering its name in the bar. Is the users have never tried working with the platform before, they may test it by clicking on the “Test here!” hyperlink and get acquainted with a default board and its features.

When the name of the board is chosen or the link is used, one can start working on a project. At first, board.net reminds a virtual pad to make notes in. However, the more you get acquainted with it and its features (https://git.fairkom.net/hosting/board.net/-/wikis/board-features), the more it reminds you an interactive board your teacher or you have may have used during a class.

There are several panels to look at. The central one is white, representing a digital endless page, where all tasks, notes, links and other types of material is displayed. Starting with the left upper corner, the upper horizontal panel, in its turn, offers a choice of *four* standard *font types* – bold, italic, underline and strikethrough – with keyboard shortcuts for quick option selection. To the right behind them there are the designations of *numbering* and *markers* for the design of lists. The latter, as well as any distinguished word, word combination or sentence, may also have an *indent* or an *outdent*. The *round arrow icons* allow the users to go to different versions of the document back and forth to delete or add some changes and get back to the current page view.

One of the distinctive features of board.net is an opportunity to choose a particular color to make every doing of a certain user visible to other participators and make his or her supplementations well-distinguished. Besides, there is a way to turn this feature of by clicking on *the crossed eye icon* and confirm the action.

Every text and attachments to it can be freely *aligned* left and right, as well as centered and justified to meet the requirements of the whiteboard users. As for the attachments, i.e., additional materials and sources of information, the platform provides the opportunity to create and attach various types of them to the virtual document. For example, if one needs to structuralize the data and work separately to consider each part of it, he or she may click on *the table icon* to create one and then to fill it in. Table sizes can be selected

immediately or modified while editing by adding or removing rows and columns. The maximum number of cells vertically is 10, when the biggest possible number of the horizontal ones equals 20 cells. Apart from tables, one may insert a drawing into the board by clicking on the icon of a triangle and a circle combined. The *drawing tool* lets its users exercise their imagination and creativity in real time and make their project more vivid. URL-links may be added by one click on *the chain link icon*, whereas in order to insert images from the computer or gadget storage one has to click on the *picture icon*. Separately, it is important to note the function of *highlighting headings* in the text using the list provided by the program to choose from. Among the text editing functions, we also need to mention the possibility to add *notes and comments* to certain written elements and parts, after selecting the needed one.

The features, located in the upper right corner, relate to the settings of the file in general. The icon with back&forth arrows indicates the function of *importing* or *exporting* a file to the board. The first allows users to upload documents from the computer or any other gadget storage as images, mentioned higher. The latter makes it possible to export the finished board in several available formats, for example: html, pdf, odf, which is an open document format, doc and others. The clock icon denotes a *timeslider*, which shows the history of the project editing. The *star* sign may be applied to mark the corrections, which can be done by a teacher in the scope of the educational process, and to save the revision, later displayed in the history timeline. The *FAQ* icon is a hyperlink to the very section of the official Faircom website, which can be used if new questions about board.net and its features keep occurring.

In order to see and alter the general *settings* of the pad one has to click on the gear icon. It will open the list of additional functions considering the *view* of a particular user and including the opportunity to decide on whether to always show the *chat* – another distinctive feature of the platform, providing all users of the project with communication in real time – on the screen as well as the *users* and *authorship colors*, which are offered to help distinguish who is wring and where. Moreover, one can choose whether to turn on the *numeration of lines*, the installed *spell check*, edit the *slideshow view* and change the *font type* (out of eight) or the *language* (out of 109 available). The human silhouette sing means *the number of users present* at the moment, allowing them to read their colleagues' or groupmates' (nick) names and get acquainted with the colors they have chosen to be marked with.

In order to invite new participants, one has to share the name of the board or share the link, deciding whether to enable editing for the upcoming users or to allow only reading.

The set of features and allowances described higher enable the consideration of board.net as a platform for distance learning in both schools and higher educational establishments. In the current paper we suggest considering the options for using boards in each educational environment separately. The general difficulty of introducing distance learning in schools, especially primary, comes from the peculiarity of children's perception of information, interaction with the world and people around, psychological and mental development, level of learning and motivation to stay in class and participate in it. Despite the higher level of awareness and motivation of secondary school students, they often lack the self-organization necessary for the lesson that is why such students, together with those staying on the primary level of education, need constant supervision from the teacher and his or her direct active involvement in the classroom, which means providing such students with knowledge in the format of synchronous distance learning with the use of computer programs that allow the usage of cameras and microphones to transfer the form of a classic lesson in the online space. In this case, board.net – a modern version of the usual school board – can be used in conjunction with programs for video conferencing as a visual component of the lesson.

As for high school students and the representatives of higher educational establishments, their prior knowledge of subjects and well-developed skills and abilities to operate with the known information, regulate their own activities during the lesson and understand the motivation to participate in the lesson in general allow teachers to be not only the organizer and controller of student activities, but also to act as a supervisor, having previously provided the students with the necessary materials for the lesson. At such learning levels, distance learning can be both synchronous, involving classes at a specific time and the presence of all members of the group or class and the teacher, and asynchronous, i.e., independently for each student with or without the involvement of the teacher. In terms of technical and organizational preparation for the lesson, the teacher may not use video conferencing programs, organizing materials exclusively in board.net, which allows presenting new information with comments and explanations and is also aimed at developing macro and micro

skills other than speaking; though enable the communication between the classmates and the teacher in the chat-messenger. Besides, the functions of the cloud service together with its stable software allow the users to work on the platform in the absence of conditions and tools necessary for normal learning and even in with unstable Internet connection, which were faced by the students of Ukrainian educational institutions, who remained in the country during martial law.

In order to confirm that the interactive etherpad board.net can be used in learning independently, we conducted an experiment by inviting a group of Ukrainian second-year students of the School of Foreign Languages to attend a distance learning lesson in English / an educational event in the form of a workshop, which was held on the platform. During the workshop, the students had to work with already known materials and get acquainted with new information, namely, the grammatical topic and to process it themselves, turning to the trainee for help, if necessary. The main materials were based on a topic ("Call of the Wild"), already familiar to the students, providing them with the skills and abilities to master the acquired knowledge of vocabulary and grammar, which, in its turn, enabled the application of the third type of complete orientation when the students followed the steps offered by the trainee and constructed the rules themselves, working them out. Prior to the workshop, the students were given a link to the particular board with already prepared tasks, questions and general explanations and suggested entering their names and colors to be indicated with (see Fig. 1 below).

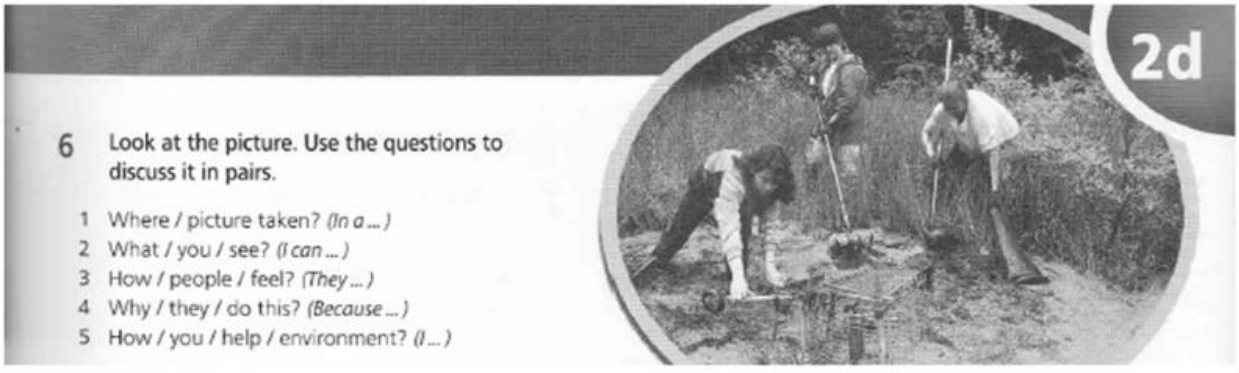
Good morning, everyone! It's your trainee Anastasia writing! I hope you are all healthy and doing well! Today we will have to cover the last but not the least part of the unit you have been working on lately and draw a conclusion in the topic "Call of the wild".

*Don't forget to enter your names, so I can see who is participating.

Do the tasks and leave your answers right under the exercises. Try working as one big team and do the tasks together.

Fig. 1. Greeting

The first task for the students was from their Upstream B1+Student's Book. It was provided on the board as an image whereas the answer space was presented and numbered below depicted in Fig. 2 on the following page. Two students volunteered to begin while their groupmates could share their opinion in the chat.



1) Probably in the forest
2)We can see three people
3)Tired
4)Want to keep the place clean
5)Don`t litter !!!!!!

Fig. 2. Task 1. Answer the questions

The second task (represented in Fig. 3) was connected with active vocabulary and markers. The students had to get acquainted with the text and fill in the gaps with the variant provided, writing them under the image.

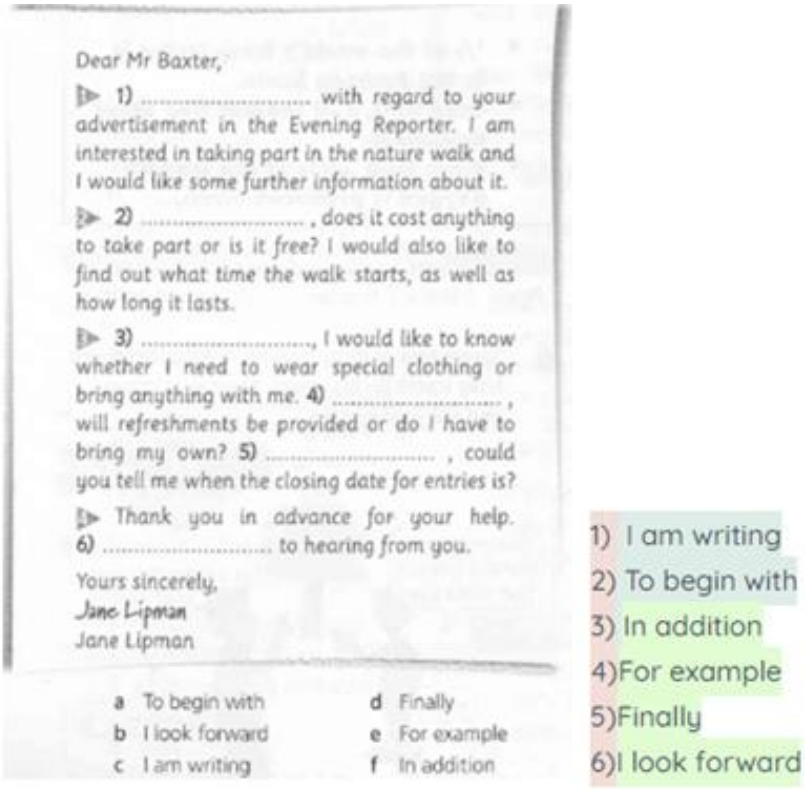


Fig. 3. Task 2. Read the text and fill in the gaps

The next task involved familiarizing the students with the grammatical scheme (see Fig. 4).

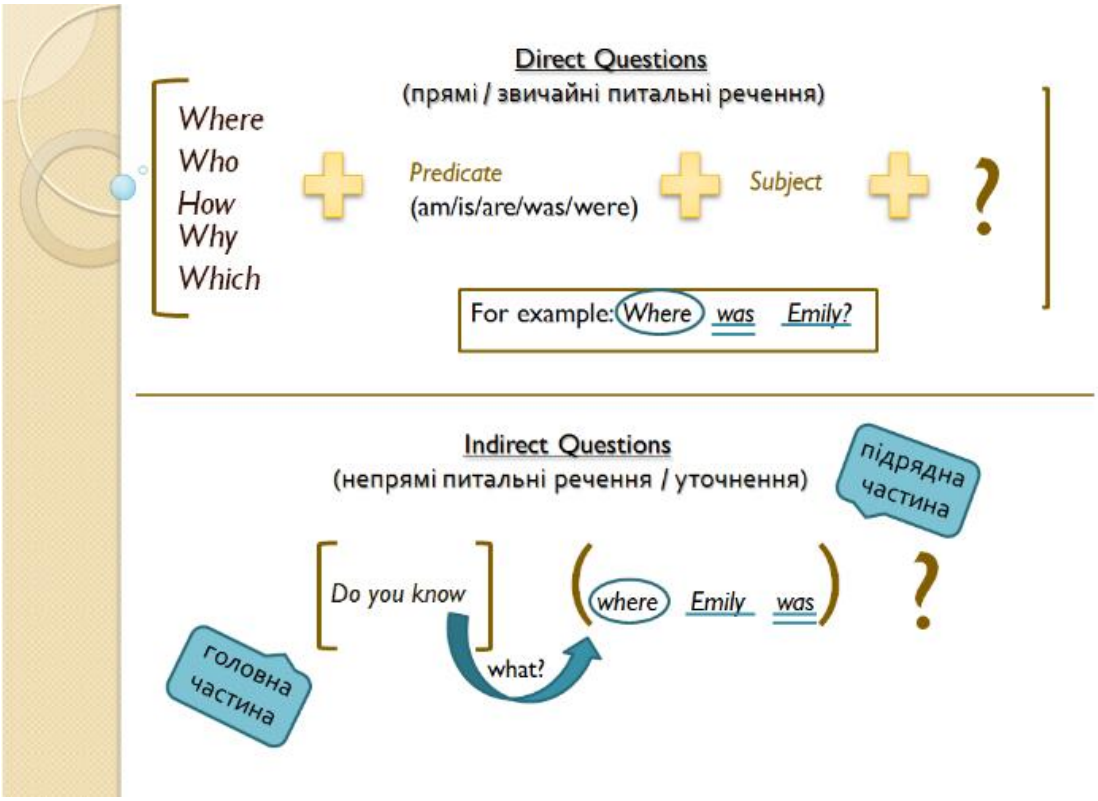
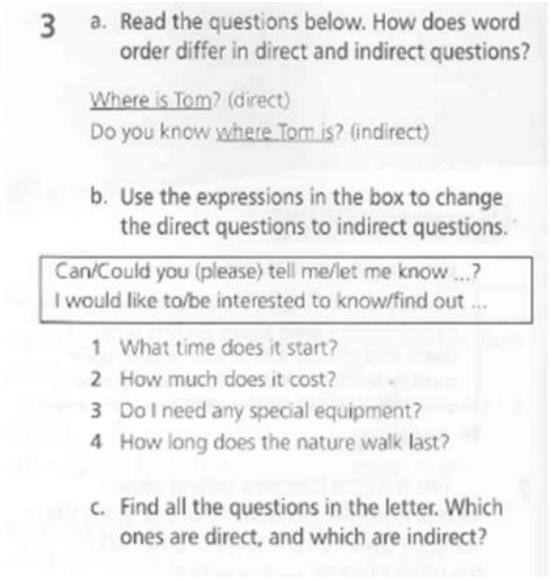


Fig. 4. Direct and indirect questions

In the chat, they could ask questions about understanding the rule and further work it out in the following exercise depicted in Fig. 5. Board.net provided us with an opportunity to add the slide with explanations and allowed the continuous communication with the students.



3 a. Read the questions below. How does word order differ in direct and indirect questions?

Where is Tom? (direct)
Do you know where Tom is? (indirect)

b. Use the expressions in the box to change the direct questions to indirect questions.

Can/Could you (please) tell me/let me know ...?
I would like to/be interested to know/find out ...

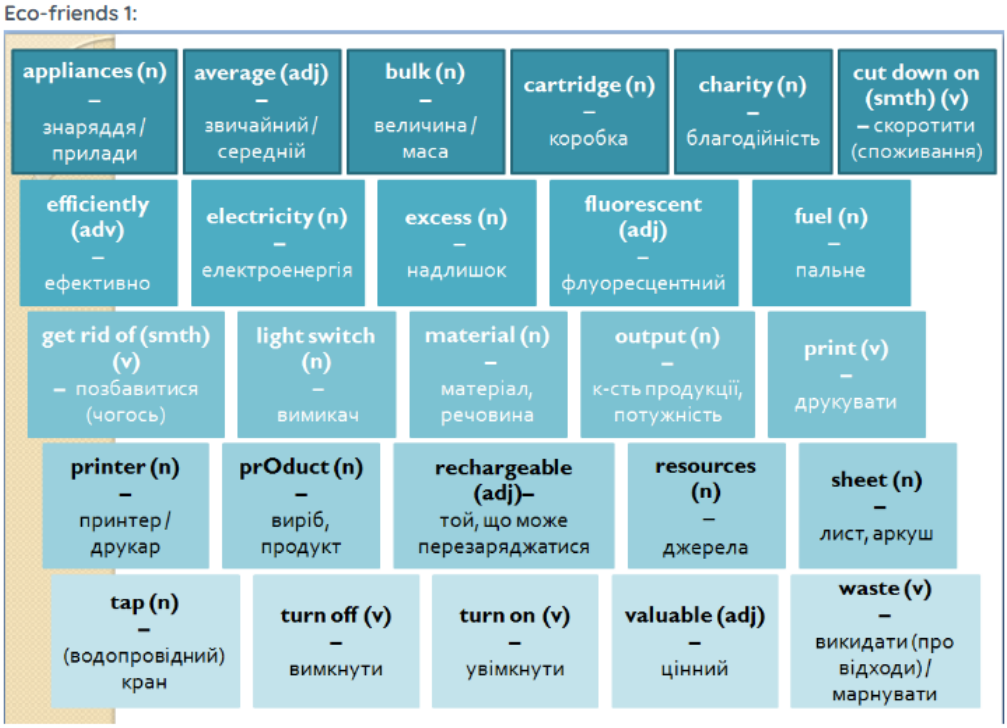
1 What time does it start?
2 How much does it cost?
3 Do I need any special equipment?
4 How long does the nature walk last?

c. Find all the questions in the letter. Which ones are direct, and which are indirect?

1) Do you know what time it starts?
2)Do you know how much it costs?
3)Could you tell me whether I need any special equipment?
4)I would like to know how long the nature walk lasts.

Fig. 5. Practice the rules

Later on the students were shown an image with their active vocabulary (see Fig. 6), asked to check the translation with their own, discussing their variants in the chat if necessary, and make up sentences to memorize the collocations better, writing them under the image.



Make up one meaningful sentence using only active vocabulary, needed pronouns and links (слова-зв'язки).
1)Cockroaches commonly give ma a headache.
2)Are new appliances of high efficiency?
3)Skin gets dry after spraying toxic sprays on it.
4) We should get rid of fuel excess.
5) People waste a bulk of valuable resources.

Fig. 6. Task 3. Vocabulary practice

The last but not the least task, provided in Fig. 7 below, was to click on the attached link to get acquainted with a YouTube video and answer the questions below.

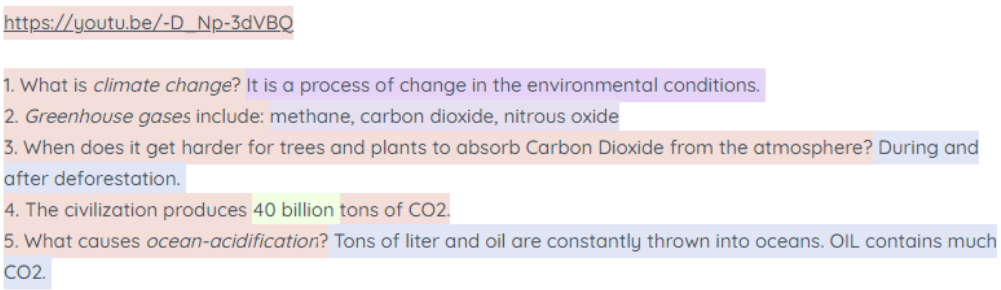


Fig. 7. Task 4. Watch the video and answer the questions

When the lesson was over and the students were thanked for their participation, we could draw a conclusion that despite the fact that not all students were able to join the class for personal reasons, and some had to leave the class to rejoin later, the platform proved to be one where the students can freely write and leave comments; read, getting acquainted with the visuals; watch videos, developing listening skills, as well as maintaining constant communication with classmates and the teacher, who in his or her turn can observe and supervise the answers, offer new tasks and explain something unclear, basically conducting the lesson without a video presence. Though board.net does not provide the feature enabling video calls, yet, it allows the users to interact with each other and work on projects together, which, within the educational system, means that students upgrade their micro and micro skills, stay in touch with their groupmates and the teacher, feel as students no matter what conditions they are under and have an opportunity to go back to the same board whenever they want to look through the material and revise it. Later on, this very board may turn into the complete compendium if the teacher decides to continue uploading the materials and notes for the next lessons in the same virtual file.

As we have demonstrated the possibility of the successful inclusion of the platform into the list of interactive services that can modernize the educational system, especially in the distance learning format, we find it necessary to identify the level of compliance of board.net in comparison with its competitors within the framework of learning. Let's consider the etherpad's advantages and disadvantages comparing with Miro, Jambord and Zoom whiteboard. Miro is a well-known platform in the sphere of education, often used by teachers to conduct lessons. The main differences it displays, compared to board.net, are: the necessity to register an account; the availability of only three boards in a demo version, though they seem to be large and may contain much information; and the opportunity to use such features as tags, stickers, figures, cards, voting and stickies capture – a function of copying written information from a screenshot. Moreover, a board in Miro also has a larger variability of text editing tools. However, its share mode allows other users to edit the file and leave comments only if they have a premium account [18] (https://miro.com/online-whiteboard/), which makes the platform useful only as a visual addition to the lecture, where board.net provides its users with the freedom to fully dive into the project and work simultaneously. Furthermore, the payment for board.net usage is optional and is only requested from companies and organizations if they want to formally introduce the platform into their workflow.

Jamboard, in its turn, is more similar to board.net according to its characteristics and functioning, reminding the combination of Google Docs and a whiteboard: it provides its users with basic features and tools like text implementation, erasers, import and export of the finished version, though only in a limited number of formats, for free. However, unlike board.net, this platform synchronizes with Google Meet and may be used during a video conference [8] (https://edu.google.com/jamboard/), which allows students to expand the scope of the skills they can develop during the lesson. Yet, if Jamboard is used outside of the video call, it provides almost the same services board.net does, except a chat, a comment section and tables the former lacks.

Zoom whiteboard has a similar set of tools to work with as well, including a text editor, an eraser and a bin, though it is smaller than the one board.net offers [26] (https://support.zoom.us/hc/en-us/articles/205677665-Sharing-a-classic-whiteboard). Besides, Zoom board is almost inseparable from the video conference platform itself, implying that it is impossible to add extra files to it, create hyperlinks out of the

text or even open it without Zoom turned on. The only way the information displayed on the board may be kept and then distributed is with the help of the “save to the album” option.

General information comparing different characteristics of online boards is presented in Table 1.

Table 1. Interactive Board Comparison

Indicator	board.net	Miro	Jamboard	Zoom Whiteboard
Registration	-	+	-	-
Payments	Volutary	For the premium version	-	-
Number of frames available	Unlimited canvas	3 frames (in a demo version)	20 frames	1 frame
Full usage in the learning process	+ (independently or with video conference programs)	+ - (with video conference programs)	+ - (with Google Meet)	+ - (inseparable from Zoom)
Timeslider	+	-	-	-
Opportunity to share	+	+	+	-
Opportunity to edit	+	+ - (available in premium version)	+	+
Comments available	+	+ - (available in premium version)	+	-
Chat	+	+	-	-
Voting availability	-	+	-	-
Cards	-	+	-	-
Import / export	+	+	+ - (only export in pdf and jpeg format)	+ - (only export in jpeg format)
History	+	+	-	-
Background	-	-	+	-
Authorship colours	+	-	-	-
Text editor	+	+	+	-
Font types & colors	+	+	-	+ - (only types)
Shapes	+	+	+	+
Stickies capture (a function of copying written information from a screenshot)	-	+	-	-
Stickers	-	+	+	-
Links	+	+	-	-
Drawing tool	+	+	+	+

Thus, we can conclude that although board.net falls behind some of its competitors in terms of functionality, it also has enough advantages, the main of which is the ability to be used for distance learning both independently and as an auxiliary platform and attract everyone who owns a link to the board to participate in the lesson.

IV Discussion

Using an online whiteboard requires certain skills from all participants in the educational process, but the main burden naturally falls on the teacher, so it is important, first of all, to develop his ability to work with tools such as online whiteboards. In this regard, it may be interesting to highlight the most important factors or competencies that a teacher needs to develop on the way to improve his skills in organizing a digital didactic space. Tatli & Kiliç [28] took part in the project "Movement of Enhancing Opportunities and Improving Technology" and found no significant difference between the use of interactive whiteboard features and gender, educational level or subject area. However, a significant difference was found between the use of interactive features and professional experience, urban versus rural, possession of digital learning tools, previous experience with interactive whiteboards, duration of use, frequency of use. Thus, it can be concluded that these parameters need to be developed as a matter of priority [28].

The introduction of interactive technologies is an important factor in modern education, especially in times of crisis. Online boards are one of the most effective ways to increase student engagement in a subject. A study by Mata L., Lazar G., & Lazar I. [16] which was aimed at studying the influence of the level of education on the attitude of students to interactive whiteboards (in higher education). Their survey involved different levels of undergraduate, graduate and doctoral education. The questionnaire consisted of 4 sections focused on the accessibility of using the interactive whiteboard and the components of pedagogy, psychology and group interaction. The results obtained revealed the presence of significant differences between students of different levels of education in relation to certain factors, the use of online boards as a means of interactive learning. Despite some positive feedback about interactive whiteboards, students are only gradually accepting the introduction of new technologies along with their higher levels of education [16].

Online boards are primarily a means for teamwork and an important factor in this process is the selection of leaders among students and the development of leadership skills. In this context, online boards can act as an online discussion forum for team interaction and solving learning problems in the most efficient way. McRay J., Goertzen B., & Klaus K. [17] review the "Discussion Module" session assigned in the Graduate Leadership Theory Online Course. The assignment was designed to stimulate higher-level thinking, put leadership theory into practice, and promote broad communication among students in an online learning environment using a common online whiteboard communication tool. The participants of the session emphasized that the task led to a high level of engagement and critical thinking in the online learning environment.

An integral factor in modern education is the introduction of gamification elements [29] into the educational process. The potential of online boards in this process is quite large, especially when learning foreign languages. Hadi F. & Darmawan A. [10] in their study examine the impact of online whiteboards as a platform for learning gamification in the process of learning a foreign language. The result of this study showed that the introduction of this digital communication tool has created an exciting atmosphere in learning in general and speaking in particular. As a result, these observations showed that students were very actively engaged in oral communication activities. The result of the data from the questionnaire showed that the majority of students were enthusiastic about learning conversational speech with the help of learning tools of board games using online boards.

Crisis phenomena in learning, such as quarantine or natural disasters, can cause disruptions in the usual online learning. In this case, students study asynchronously and the output in this case can be online whiteboards, which are often used as a pedagogical tool in traditional, hybrid and online higher education courses. Carr J. [7] points out that future teachers may be frustrated by the monotonous structure of traditional asynchronous online forums. In teacher training, we affirm that we understand that future teachers learn differently. However, most of the tasks have a linguistic focus. This demonstration of knowledge is not effective for everyone. To support all students, educators can find ways to stand out by incorporating alternative asynchronous discussion and interaction platforms such as Flipgrid and BookSnaps and other tools. Which greatly diversifies learning and will help future teachers to see the pros and cons of asynchronous interaction from their own experience.

V Conclusion

On the whole, board.net is a promising cloud platform with a set of various functions and tools that can be used in the learning process. There is no doubt that its usage in the scope of the remote learning will improve the quality of education and help minimize the time and effort spent on the processing of information and the acquisition of knowledge by students. Board.net can be freely applied in education both together with other related programs as an alternative basis for online classes, and on its own. The high quality of the platform, simple interface and constant updates and suggestions from the technical team makes it convenient and stable to use for both teachers and students, who can work on tasks at the simultaneously – one just needs the link – relying entirely on tips and explanations from the teacher (for example, to get acquainted with a new topic), or study relatively independently. In addition, students who do not have the opportunity to attend classes regularly for personal reasons such as health conditions or a difficult life situation can return to a certain board when it is convenient for them to continue studying in an asynchronous remote format.

Research prospects. In the future, we plan to continue studying the issue of introducing modern technologies into the educational system for its smoother, but more effective adaptation to the needs of students and teachers, paying attention to programs and interactive platforms that improve the educational process.

References

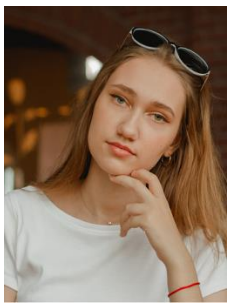
1. Araiza-Alba, P., Keane, T., Chen, W. S., & Kaufman, J. (2021). Immersive virtual reality as a tool to learn problem-solving skills. *Computers & Education*, 164, 104121.
2. Board features Wiki hosting / board.net (2022) – GitLab. URL: https://git.fairkom.net/hosting/board.net/-/wikis/board-features (accessed 09.05.2022).
3. Board.net (2022). URL: https://board.net/ (accessed 08.05.2022).
4. Board.net | fairkom (2022). URL: https://www.fairkom.eu/en/boardnet (accessed 07.05.2022).
5. Bodnenko, D. M., Kuchakovska, H. A., Proshkin, V. V., Lytvyn, O. S. (2020). *Using a virtual digital board to organize student's cooperative learning*, Proceedings off the 3rd International Workshop on Augmented Reality In Education (AREdu 2020). Burov O. Yu., Kiv A. E. (Eds.). Kryvyi Rih, Ukraine: CEUR-WS.org. 357–368. URL: http://ceur-ws.org/Vol-2731/paper21.pdf (accessed on: 08.05.2022).
6. Buckler, L. (2017). Teach, Learn, Share: the Role of Social Media in eLearning. URL: https://www.shiftelearning.com/blog/teach-learn-share-the-role-of-social-media-in-elearning (accessed 08.05.2022).
7. Carr, J. (2020). Teacher candidate perceptions on alternative asynchronous online discussion boards. *Journal of Educational Technology and Online Learning*, 3(3), 288-310. https://doi.org/10.31681/jetol.752283
8. Collaborative Digital Whiteboard (2022). URL: https://edu.google.com/jamboard/ (accessed 09.05.2022).
9. Fisher, C. (2017). Padlet: An Online Tool for Learner Engagement and Collaboration. *Academy of Management Learning & Education*. 16(1). 163–165. https://doi.org/10.5465/amle.2017.0055
10. Hadi, F. & Darmawan, A. A. (2022, February). The Implementation of Virtual Board Games in Teaching Speaking to the Undergraduate Students. *In 67th TEFLIN International Virtual Conference & the 9th ICOELT 2021* (TEFLIN ICOELT 2021) (pp. 282-285). Atlantis Press. https://doi.org/10.2991/assehr.k.220201.050
11. Jang G., Ylirisku S., Sawhney N. (2021). Re-thinking Pedagogy and Dis-embodied Interaction for Online Learning and Co-Design. *Nordes 2021: Matters of Scale*. 9. 423–432. https://doi.org/10.21606/nordes.2021.48
12. Khoshnevisan, B., & Rashtchi, M. (2021). Developing online discussion boards to increase student engagement during the COVID-19 pandemic. *Dual Language Research and Practice Journal*, 4(1). 39-50. https://doi.org/10.21423/dlrpj-v4.a29
13. Kneen, J. (2015). Interactive whiteboards and English teaching: A consideration of typical practice. *English in Education*, 49(3), 215-232. https://doi.org/10.1111/eie.12072
14. Linjawi, A. I., Walmsley, A. D., & Hill, K. B. (2012). Online discussion boards in dental education: potential and challenges. *European Journal of Dental Education*, *16*(1), e3-e9.
15. Lohmann, M. J., & Boothe, K. A. (2020). *Developing asynchronous online discussion boards to increase student engagement and learning*. In Handbook of research on developing engaging online courses (pp. 134-151). IGI Global.
16. Mata, L., Lazar, G., & Lazar, I. (2016). Effects of study levels on students' attitudes towards interactive whiteboards in higher education. *Computers in Human Behavior*, *54*, 278-289. https://doi.org/10.1016/j.chb 2015.07.044
17. McRay, J., Goertzen, B., & Klaus, K. (2016). Student-moderated discussion boards in a graduate online course. *Journal of Leadership Education*, 15(1), 150-160. https://doi.org/1012806/V15/I1/A6
18. Miro Online Whiteboard (2022). Retrieved from https://miro.com/api/. (Accessed on: 09.05.2022)
19. Nalyvaiko, O., Vakulenko, A. (2021). Canvas LMS: Opportunities and Features. *Educological discourse*. 35(4). 154–172. DOI: https://doi.org/10.28925/2312-5829.2021.410
20. Nalyvaiko, O., Vakulenko, A., Zemlin, U. (2020). Features of Forced Quarantine Distance Learning. *Scientific notes of the pedagogical department*. 47. 78–87. DOI: https://doi.org/10.26565/2074-8167-2020-47-09

21. Nalyvaiko, O., Vakulenko, A., & Zemlin, U. (2020). The use of the mobile application “DROPS” in the process of learning foreign languages. *Electronic Scientific Professional Journal “Open Educational E-Environment of Modern University”*, (8), 107-120. https://doi.org/10.28925/2414-0325.2020.8.10
22. Napal, M., Mendióroz-Lacambra, A. & Penalva, A. (2020). Sustainability teaching tools in the digital age. *Sustainability*, 12(8), 3366.
23. Onyema, E. M., Deborah, E. C., Alsayed, A. O., Noorulhasan, Q., & Sanober, S. (2019). Online discussion forum as a tool for interactive learning and communication. *International Journal of Recent Technology and Engineering*, 8(4), 4852-4859. https://doi.org/10.35940/ijrte.D8062.118419
24. Phillippi, J. C., Schorn, M. N., & Moore-Davis, T. (2015). The APGAR rubric for scoring online discussion boards. *Nurse Education in Practice*, 15(3), 239-242. https://doi.org/10.1016/j.nepr.2014.11.002
25. Ransdell, S. Borror, J. & Su, A. (2018). Users not Watchers: Motivation and the use of discussion boards in online learning, *FDLA Journal*, 3, Article 4. Available at: https://nsuworks.nova.edu/fdla-journal/vol3/iss1/4
26. Sharing a classic whiteboard - Zoom Support (2022). Retrieved from https://support.zoom.us/hc/en-us/articles/205677665-Sharing-a-classic-whiteboard. (Accessed on: 09.05.2022)
27. Stoten, D.W., Oliver, S., O’Brien, J. & Swain, C.G. (2018), Co-creation and online learning: A case study of online discussion boards at an English business school, *Journal of Applied Research in Higher Education*, 10(1), 44-60. https://doi.org/10.1108/JARHE-06-2017-0068
28. Tatli, C. & Kiliç, E. (2016). Interactive whiteboards: do teachers really use them interactively? *Interactive Learning Environments*, *24*(7), 1439-1455. https://doi.org/10.1080/10494820.2015.1016536
29. Zhernovnykova, O., Peretiaha, L., Kovtun, A., Korduban, M., Nalyvaiko, O., & Nalyvaiko, N. (2020). The technology of prospective teachers’ digital competence formation by means of gamification. *Information Technologies and Learning Tools*, 75(1), 170–185. https://doi.org/10.33407/itlt.v75i1.3036

Наливайко Олексій Олексійович,
Кандидат педагогічних наук, доцент кафедри педагогіки, заступник декана за наукової роботи факультету психології, Харківський національний університет імені В.Н. Каразіна,
Майдан Свободи, 4, Харків, Україна.
Тел. +380639586169. E-mail: nalyvaiko@karazin.ua

Nalyvaiko Oleksii,
Ph.D. in Pedagogy, Associate Professor of Pedagogy Department, Deputy Dean for Research at the Faculty of Psychology, V. N. Karazin Kharkiv National University,
Maidan Svobody, 4, Kharkiv, Ukraine.
Tel. +380639586169. E-mail: nalyvaiko@karazin.ua

ORCID: 0000-0002-7094-1047
Researcher ID: AAW-3549-2020



Вакуленко Анастасія Ігорівна,
Студентка 1 курсу магістратури факультету іноземних мов,
Харківський національний університет імені В.Н.Каразіна,
Майдан Свободи, 4, Харків, Україна.
Тел. +380509628695. E-mail: fullmetalanastasia@gmail.com

Vakulenko Anastasiia,
1st year master's student of Foreign Languages Department,
V. N. Karazin Kharkiv National University,
Maidan Svobody, 4, Kharkiv, Ukraine.
Tel. +380509628695. E-mail: fullmetalanastasia@gmail.com

ORCID: 0000-0001-7829-7236
Researcher ID: AIB-7770-2022

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